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Chicago, Illinois 60690 - 0767

May 9, 1988

Mr. T.E. Murley
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC. 20555

Subject: Quad Cities Station Units 1 and 2
Dresden Station Units 2 and 3
"Response to NRC Request for Additional Information Pertaining to 10 CFR, 50.62 Anticipated Transient Without Scram (ATWS) Rule"
NRC Docket No 50-254 and 265 and 50-237 and 249

Reference: (a): Letter from JA Zwolinski to D.L. Farrar, dated December 17, 1986.
(b): Letter from IM Johnson to TE Murley, dated September 30, 1987
(c): Letter from T Ross to LD Butterfield, dated February 18, 1988

Dear Mr. Murley:

Reference (a) transmitted a copy of the NRC's Safety Evaluation in support of the BWR Owners Group licensing topical response to the ATWS rule. The same document requested what Commonwealth Edison (CECo) review its conformance to the 10 CFR 50.62 ATWS Rule at its Quad Cities and Dresden Stations against the NRC Safety Evaluation of the GE Owner's Group Topical. Reference (b) provided our response to this request. Recently, a Request for Information (RAI) was transmitted to CECo via Reference (c).

Attached please find a copy of our response to Reference (c). An additional question was raised by Mr. T Ross (Quad Cities-Project Manager) which was not included in the February 18, 1988 RAI. We were asked to provide information pertaining to the ARI, RPT and RTS systems/model numbers. This information is also being provided at this time.

A055
1/1

Lastly, Commonwealth Edison intends on submitting Recirc Pump Trip (RPT) Technical Specifications for Dresden & Quad Cities Stations by August 1, 1988.

Please direct any questions regarding this matter to this office.

Very truly yours,

I. M. Johnson
Nuclear Licensing Administrator

/gs

Enclosures

cc: M.Grotenhuis-NRR
T. Ross-NRR
NRC Resident Inspectors-
Dresden & Quad Cities W/O Attachments

4608K

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50-237

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GENERAL ELECTRIC

REQUEST FOR ADDITIONAL INFORMATION ON ATWS REVIEW RELATED TO ALTERNATE ROD INJECTION (ARI) AND RECIRCULATION PUMP TRIP (RPT) SYSTEMS QUAD CITIES STATION - UNITS 1 & 2 DRESDEN STATION - UNITS 2 & 3

Your submittal letter indicates the material presented is for Quad Cities Station Units 1 and 2 as well as Dresden Units 2 and 3. Please provide the following design information as supporting documentation of your method of compliance with 10CFR50.62 and identify the units which are covered by each submittal item.

1.0 The electrical functional diagrams for the ARI and RPT systems from the sensors to the final actuated devices.

Answer:

The electrical functional diagrams for the ARI and RPT systems from the sensors to the final actuated devices are as follows:

Dresden		Quad Cities	
Units 2	Unit 3	Unit 1	Unit 2
12E-6582A	12E-7582A	4E-6577A	4E-7573A
12E-6582B	12E-7582B	4E-6577B	4E-7573B
12E-6582C	12E-7582C	4E-6577C	4E-7573C
12E-6582D	12E-7582D	4E-6577D	4E-7573D
12E-6582E	12E-7582E	4E-6577E	4E-7573E
12E-6582F	12E-7582F	4E-6577F	4E-7573F
12E-6582G	12E-7582G	4E-6577G	4E-7573G
12E-6582H	12E-7582H	4E-6577H	4E-7573H

1.1 Identify the ARI reset capabilities including the time delay to ensure ARI scram has completed its operation.

Answer:

Once the ARI system at Dresden Units 2 & 3 and Quad Cities Units 1 & 2 is initiated, the solenoid operated valves will be energized to initiate a reactor scram. The manual and automatic signals to the ARI valves seal-in for 30 seconds to assure that the scram air header adequately depressurizes. After 30 seconds, if the initiation signal is cleared, the ARI valves will be deenergized. If the initiation signal is still present (after 30 seconds), the ARI valves will remain energized until the signal clears.

1.2 Describe the manual initiation capabilities and the means provided to protect the system from inadvertent operation.

Answer:

For Dresden Units 2 & 3 and Quad Cities Units 1 & 2, two manual initiation switches are provided in the control room for each division of ARI logic. Failure of automatic initiation cannot prevent manual initiation. In order to avoid an inadvertent manual trip of the ARI system, the two initiation switches per division must first be armed (i.e., collar must be rotated clockwise or counter clockwise a certain specified amount). Once armed and then depressed, the switches will activate their trip functions.

The manual initiation switches for Dresden Unit 2 are located in the control room main control board (MCB) panel 902-5, both divisions. Unit 3 is located on MCB panel 903-5, for both of its divisions.

The manual initiation switches for Quad Cities Unit 1 are located in the control room MCB panel 901-5, both divisions. Unit 2 is located on MCB panel 902-5, for both of its divisions.

The two manual initiation switches are spaced such that only one can be operated at any given time by a single person, this one person would have to operate these manual switches in sequence (i.e., both switches cannot be reached by a single person to operate concurrently).

1.3 Verify no manual bypass of the RPT system is available.

Answer:

To verify that no manual bypass at the RPT system is available, the following schematic diagrams were analyzed:

Quad Cities		Dresden	
Units 1	Unit 2	Unit 2	Unit 3
4E-6577F	4E-7573F	12E-6582F	12E-7582F
4E-6577D	4E-7573D	12E-6582D	12E-7582D
4E-1422	4E-2422	12E-2422	12E-3422

1.4 Identify the ARI/RPT information readouts and indications provided in the control room. Will the ARI valves have a positive position indication; where will the indication be located.

Answer:

For Dresden Units 2 & 3 and Quad Cities 1 & 2, the ARI design provides continuous readout of level and pressure. It also provides logic trip status, power supply status, test status, and failure status at the ARI panels (located in the auxiliary equipment room). ARI system annunciators are also provided on a main control board to indicate channel trip, trouble on that the manual pushbuttons are armed.

For Dresden Units 2 & 3 and Quad Cities 1 & 2, the RPT design provides for continuous readout of level and pressure. It also provides RPT logic trip status, power supply status, test status, and failure status at RPT panels which are located in the auxiliary equipment room. Annunciators are also provided on a main control board to indicate channel trip on trouble.

2.0 Provide electrical one-line diagrams to demonstrate the electrical independence between the ARI system and the Reactor Trip System (RTS), and the capability to perform the ARI function during the loss-of-offsite power event.

Answer:

For Dresden Units 2 & 3 and Quad Cities Units 1 & 2, the ARI design is safety-related and segregated into two electrical divisions; namely Division I and Division II which are maintained separate. The RTS at the Dresden and Quad Cities stations is the Reactor Protection System (RPS) which is a four-channel electrical arrangement which has individual channel separation. All four RPS channels are routed in separate conduits and never routed with divisional segregated circuits.

The power for the RTS (i.e., RPS) is 120V ac from the RPS motor generator sets. The ARI system will operate fully from non-interruptible dc (i.e., onsite station batteries) which are independent from the RPS power. Thus the ARI system will perform its function during any loss of offsite power event.

Note that both the RPS & ARI systems are normally fed from ac sources, where for the ARI system ac is converted to dc for power to it. Note, however, that a loss of offsite power the ARI system will be fed from the non-interruptible 125V dc battery. While the RPS will be fed from the diesel generators.

The electrical one-line diagrams that demonstrate the electrical independence between the ARI system and the reactor protection system are attached to the end of this document.

3.0 Describe the system design which permits maintenance and the test of the system logic while the plant is in power operation.

Answer:

For Dresden Units 2 & 3 and Quad Cities 1 & 2, for each actuation parameter (e.g., low water level) the logic is arranged in a two-out-of-two configuration per division. This allows individual sensors, trip units, etc., to be tested or calibrated during plant operation without initiating the ARI system. Test pushbuttons and indicating lights are provided for testing the ARI control logic and instrumentation up to but not including the final ARI solenoid valves.

For Dresden Units 2 & 3 and Quad Cities Units 1 & 2, for each actuation parameter (e.g., low water level) the logic is arranged in a two-out-of-two configuration per division. This allows individual sensor, trip units, etc., to be tested on calibrated during plant operation without initiating a trip of the reactor recirculation pumps. Test pushbuttons and indicating lights are provided for testing the RPT control logic and instrumentation up to but not including the final actuating devices (trip coils and breakers).

4.0 Verify that the ARI actuation setpoints will not challenge the RPS scram settings; identify the settings and levels to be used.

Answer:

For Dresden Units 2 & 3 and Quad Cities Units 1 & 2, the ARI trip settings for the reactor pressure is 1228 psig (nominal) and for vessel level is 59" below the separation skirt. The RPS trip settings for reactor pressure is 1060 psig and for vessel level is 1" above the separation skirt. Therefore, the automatic setpoints for ARI actuation have been selected such that they will not challenge the RPS scram function.

AN:pjh
3/16/88
NBI/RDQZ-EP215

SARGENT & LUNDY ENGINEERS

Calcs. For ARI & RPT Instrument Model Numbers		Calc. No.
Safety-Related / Non-Safety-Related		Rev. / Date
		Page of

Client CECo	Prepared by Yoshiyuki Nehra	Date
Project Dresden & Quad Cities	Revlewed by	Date
Proj. No. 7447-00 Equip. No.	Approved by	Date

1) Pressure Sensors - Rosemount Model 1152 transmitters

2) Electronic trips - Rochester Model PTA-215

3) Power Supplies - Fisher Control Model MC-76B

4) Cutler Hammer Switch - Model No. 10250ED090-8

5) GE Switch - Type CR2940

6) Agastat relays - GPBC750
GPDC750
TR14BC750 time delay relay
TR14D3DC750 " " "

7) Level Sensors - Rosemount Model

QUESTION (2.0) ELECTRICAL ONE-LINE DIAGRAMS

PAGE 1 OF 3

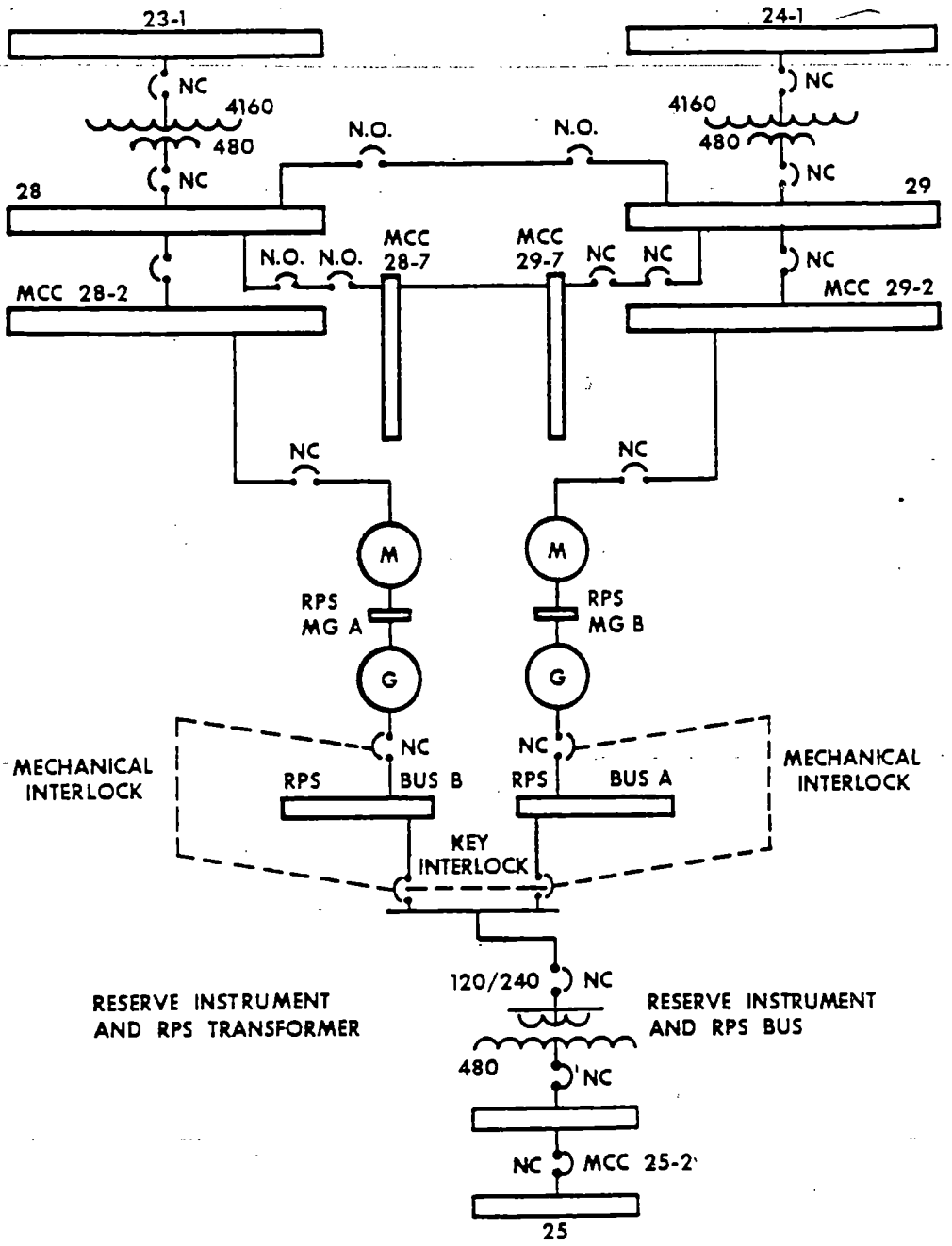
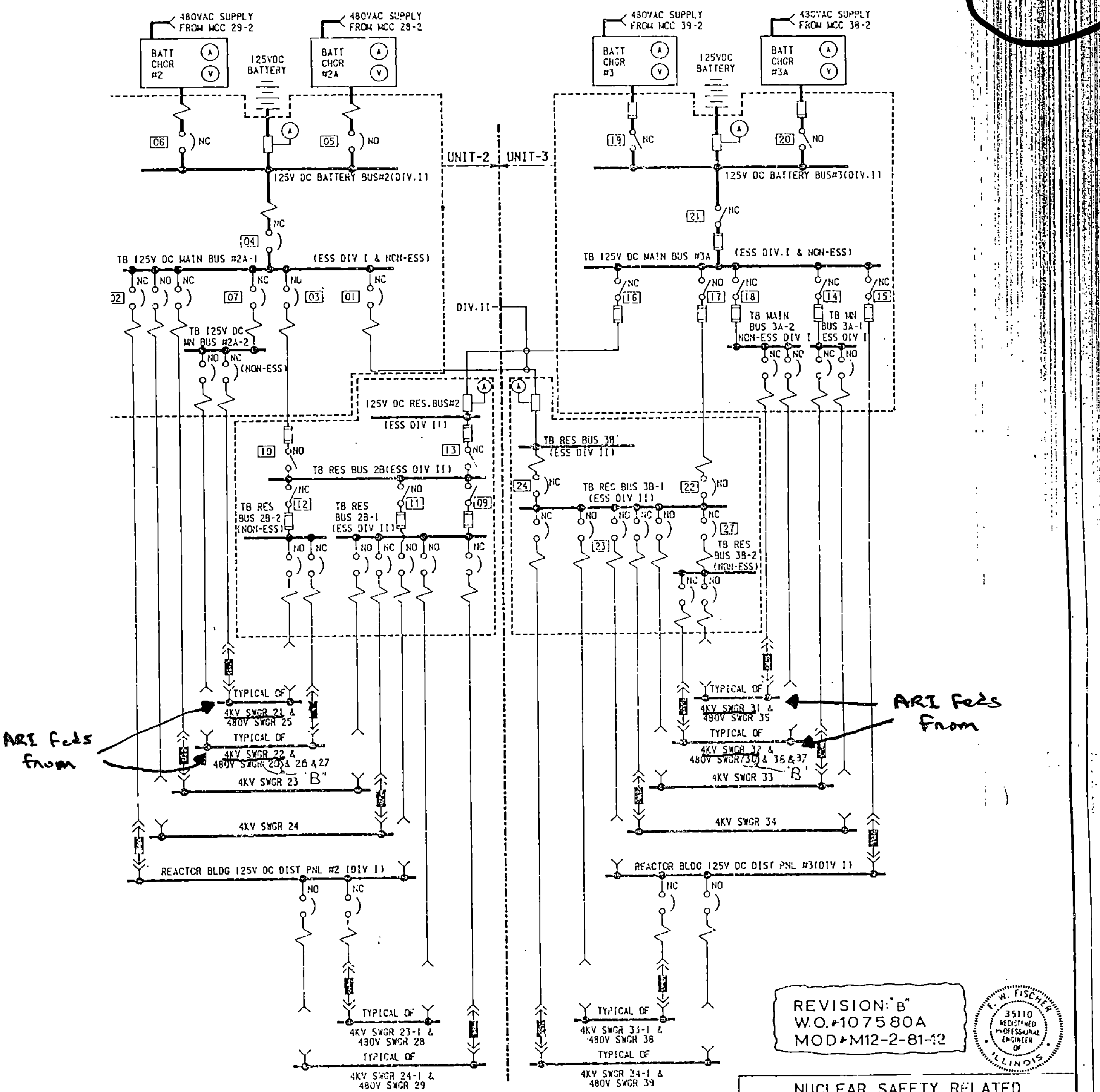


Figure 1. Reactor Protective System Distribution

Dresden Units 2 & 3 AND QUAD CITIES 1 & 2

REV. 8
1/82

OVERALL DC DISTRIBUTION SYSTEM
DRESDEN UNITS 2 & 3



480VAC SUPPLY FROM MCC 29-2
480VAC SUPPLY FROM MCC 28-2
480VAC SUPPLY FROM MCC 39-2
480VAC SUPPLY FROM MCC 38-2
BATT CHGR #2
BATT CHGR #2A
BATT CHGR #3
BATT CHGR #3A
125VDC BATTERY
UNIT-2
UNIT-3
125V DC BATTERY BUS#2(DIV. I)
125V DC BATTERY BUS#3(DIV. I)
TB 125V DC MAIN BUS #2A-1
(ESS DIV I & NON-ESS)
TB 125V DC MAIN BUS #3A
(ESS DIV. I & NON-ESS)
TB 125V DC MN BUS #2A-2
(NON-ESS)
TB MAIN BUS 3A-2 NON-ESS DIV I
TB MN BUS 3A-1 ESS DIV I
DIV. II
125V DC RES.BUS#2 (ESS DIV II)
TB RES BUS 2B(ESS DIV II)
TB RES BUS 2B-2 (NON-ESS)
TB RES BUS 2B-1 (ESS DIV II)
TB RES BUS 3B (ESS DIV II)
TB RES BUS 3B-1 (ESS DIV II)
TB RES BUS 3B-2 (NON-ESS)
TYPICAL OF 4KV SWGR 21 & 480V SWGR 25
TYPICAL OF 4KV SWGR 22 & 480V SWGR 26 & 26 & 27
4KV SWGR 23 "B"
4KV SWGR 24
TYPICAL OF 4KV SWGR 31 & 480V SWGR 35
TYPICAL OF 4KV SWGR 32 & 480V SWGR 36 & 36 & 37
4KV SWGR 33 "B"
4KV SWGR 34
ARI Feeds from
ARI Feeds from
REACTOR BLDG 125V DC DIST PNL #2 (DIV I)
REACTOR BLDG 125V DC DIST PNL #3(DIV I)
TYPICAL OF 4KV SWGR 23-1 & 480V SWGR 28
TYPICAL OF 4KV SWGR 24-1 & 480V SWGR 29
TYPICAL OF 4KV SWGR 33-1 & 480V SWGR 38
TYPICAL OF 4KV SWGR 34-1 & 480V SWGR 39
REVISION: "B"
W.O.#107580A
MOD#M12-2-81-42

FINAL OVERALL KEY-125V DC SYSTEM
(ADDITION OF NEW UNIT 3 PANEL)

NUCLEAR SAFETY RELATED EQUIPMENT IS SHOWN ON THIS DRAWING

NO.	NOTES
1.	3/2- [XX] -INDICATES A.C.B. OR FUSED SWITCH NUMBER

DRAWING RELEASE RECORD

REV	DATE	DESCRIPTION	DRAWN / CHECKED / ENGR. APPROVAL
A	02-10-84	RELEASED FOR CONSTRUCTION PER JOB#5509	[signatures]
B	9-25-84	CHANGED PER ... PER 5509-31 FOR CONSTRUCTION	[signatures]

OVERALL KEY DIAGRAM
125VDC DISTRIBUTION CENTERS-PT.2
DRESDEN NUCLEAR POWER STATION UNITS 2 & 3
COMMONWEALTH EDISON CO.
CHICAGO, ILLINOIS

SCALE NONE
DRAWN 01/19/84
CHECKED 02/10/84
ENGINEER 2-10-84
APPROVED 2-13-84

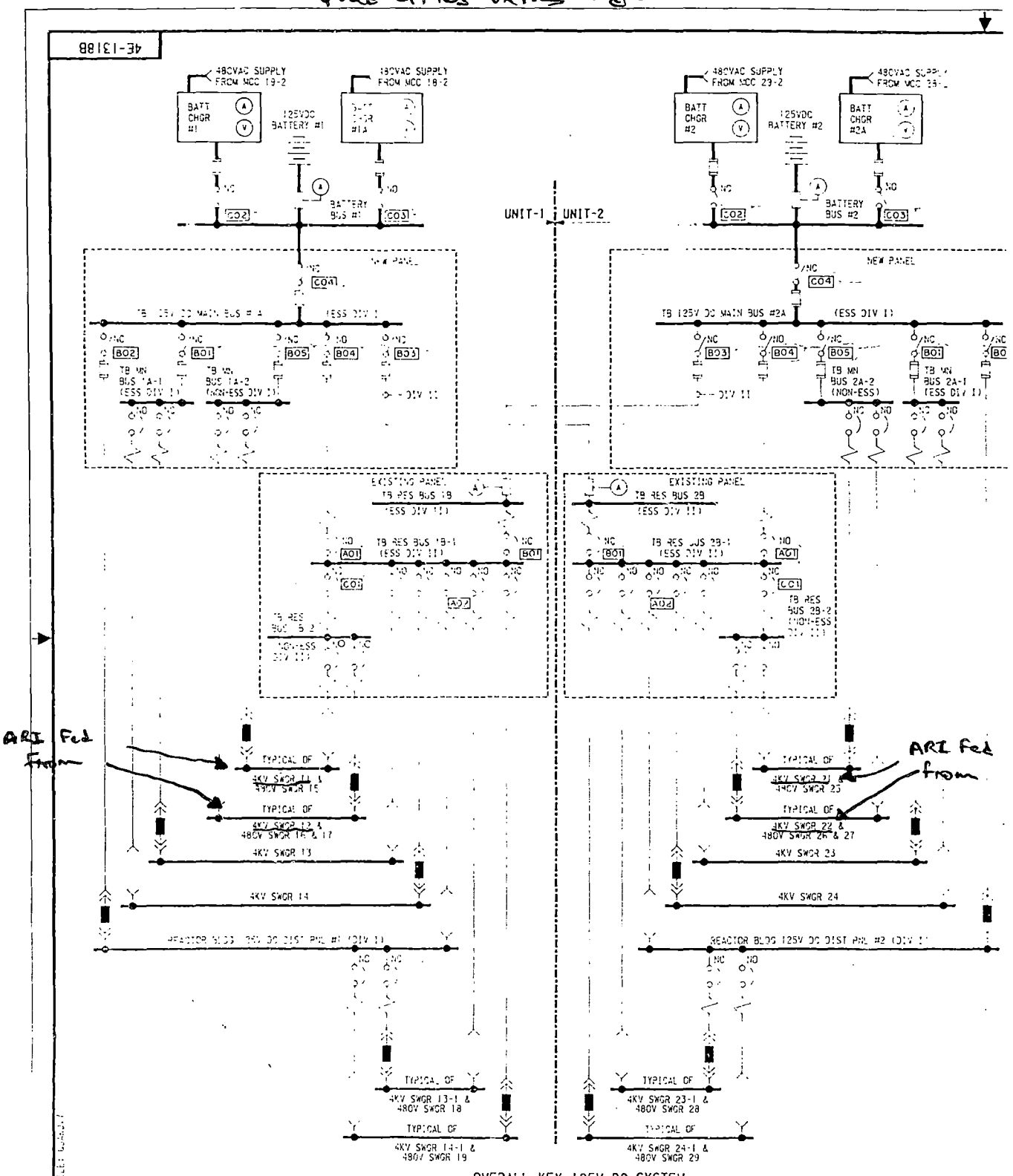
SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO. 12E-2322B2

PAGE 3 OF 3

OVERALL DC DISTRIBUTION SYSTEM

Quad Cities Units 1 & 2



OVERALL KEY-125V DC SYSTEM