UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

May 28, 1992

Docket No. 52-002

APPLICANT: Combustion Engineering, Inc. (ABB-CE)

PROJECT: CE SYSTEM 80+

SUBJECT: MEETING ON APRIL 30, 1992, REGARDING THE MODIFIED ELECTRICAL DISTRIBUTION SYSTEM FOR SYSTEM 80+

On April 30, 1992, a public meeting was held between representatives of the Nuclear Regulatory Commission (NRC) staff and ABB-CE regarding a modification to the System 80+ electrical distribution system. A list of the attendees at the meeting is provided in Enclosure 1. ABB-CE's presentation material is provided in Enclosure 2. The last two pages of Enclosure 2 pertain to the modified electrical distribution system. The other pages provide historical and background information.

ABB-CE stated that the modified distribution system design would be submitted by May 8, 1992. This would include new drawings and marked-up pages for CESSAR-DC. The switchyard designs shown are conceptual designs for an interface requirement. The Electric Power Research Institute (EPRI) Design Requirements Document requires the feed to the safety busses to be normally from the unit auxiliary transformer and fast transfer to the reserve transformers for safety buses. The diesel generator is connected to the safety buses through two breakers in series. The diesel generator output breakers are manual and normally closed. The drawing in Enclosure 2 was corrected at the meeting to designate these breakers as normally closed.

The NRC provided comments on the ABB-CE responses to requests for additional information (RAI) as follows:

RAI 430-2 ABB-CE is to confirm that the inspections, tests, analyses, and acceptance criteria (ITAAC) will ensure a non-class IE failure does not cause adverse effects on class IE components and distribution system.

RAI 430.28 Remove the caveat, "if necessary."

RAI 430.29 This response conflicts with response to 430.19.

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RAI 430.30 ITAAC must demonstrate that adequate time is available to take corrective action for any by-passed diesel generator trip that could result in diesel generator failure.

RAI 430.31 ABB-CE must provide analysis to show that the loading sequence intervals are acceptable.

RAI 430.32 Clarify the number of pumps needed. Also, can the containment spray pump be started at any time after its normal sequence when other loads are sequencing on?

Perform a failure effects and modes analysis (FEMA) to ensure that failure of any a-c bus or d-c bus does not result in a plant transient and simultanous loss of single failure protection in any safety-related system.

RAI 430.25 How many UV relays are on each bus? What is actuation logic used? Describe any co-ordination needed.

RAI 430.26 Are there different sequencers for offsite and onsite power sources?

RAI 430.34 Expand response to include d-c motors.

RAI 430.35 Elaborate on single failure protection for valve indication (diversity).

RAI 430.36 Statement must be augmented to show that penetrations can withstand maximum fault current vs. time.

RAI 430.37 Specify continuous rating plus margin for the combustion turbine.

RAI 430.38 Words about 0.8 being a non-conservative power factors assumption are wrong.

RAI 430.40 ABB-CE must make a positive response about providing surge arrestors for dry-type transformers.

RAI 430.42 Why run control and power cables in a tray with a barrier? Check cable tray fill criteria.

RAI 430.43 Item 2 clarify the use of breakers as isolation devices.

RAI 430.45 Remove claim that solid state relays do not drift.

RAI 430.47 Item 4 was not responded to.

NRC indicated other comments would be given over the telephone at a later date. NRC asked ABB-CE to ensure that all TMI items were addressed. ABB-CE was also asked to ensure that all emergency lighting fixtures were seismic Category I.

ABB-CE indicated that they would respond with mark-ups of CESSAR-DC, revised drawings and augmented responses to RAI's as soon as possible.

Original Signed By:

Thomas V. Wambach, Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation

Enclosures:
1. List of Attendees
2. ABB-CE Presentation

DISTRIBUTION:

Docket File	PDST R/F	DCrutchfield	WTravers
NRC PDR	RPierson	JNWilson	TMurley/FMiraglia, 12G18
TWambach	JMoore, 15B18	ACRS (10)	EJordan, 3701
PShea	OChopra, 7E4	CMcCracken, 8D1	GGrant, EDO

OFC:	LA:PDST	PM:PDST	SC:PDST	
NAME:	PShea	TWambach:sg	JNWilson	
DATE:	05/27/92	05/27/92	05/28/92	

OFFICIAL RECORD COPY:
DOCUMENT NAME: MTSUM430.TW

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Enclosure 1

ATTENDEE LIST

ELECTRICAL DISTRIBUTION

APRIL 30, 1992

NAME	ORGANIZATION
THOMAS V. WAMBACH	NRC/NRR/PDST
OM P. CHOPRA	NRC/NRR/DST
MARK D. CERALDI	DE&S
J. F. STONER, JR.	DE&S
BRIAN R. HAY	DE&S
BILL FOX	DE&S
S. DAUBRENE	MPR
JOHN TROTTER	EPRI
RICK TURK	ABB-CE

Enclosure 2

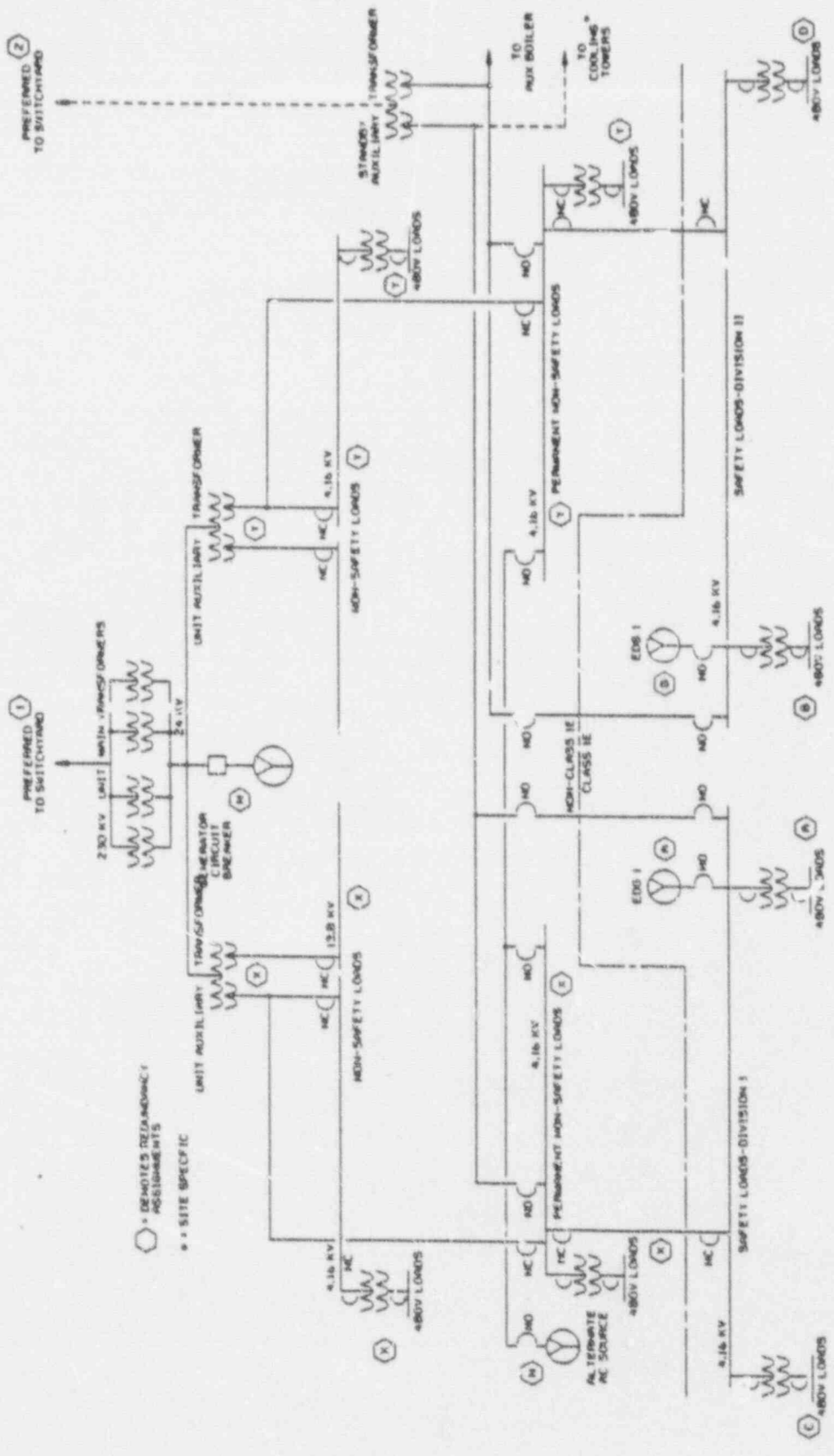
SYSTEM 80+™

ELECTRICAL DISTRIBUTION SYSTEM PROPOSAL

DISCUSSION MEETING

ABB-CE OFFICES
ROCKVILLE, MARYLAND
APRIL 30, 1992

CALMA FILE:
I:CLKOHLIF10831



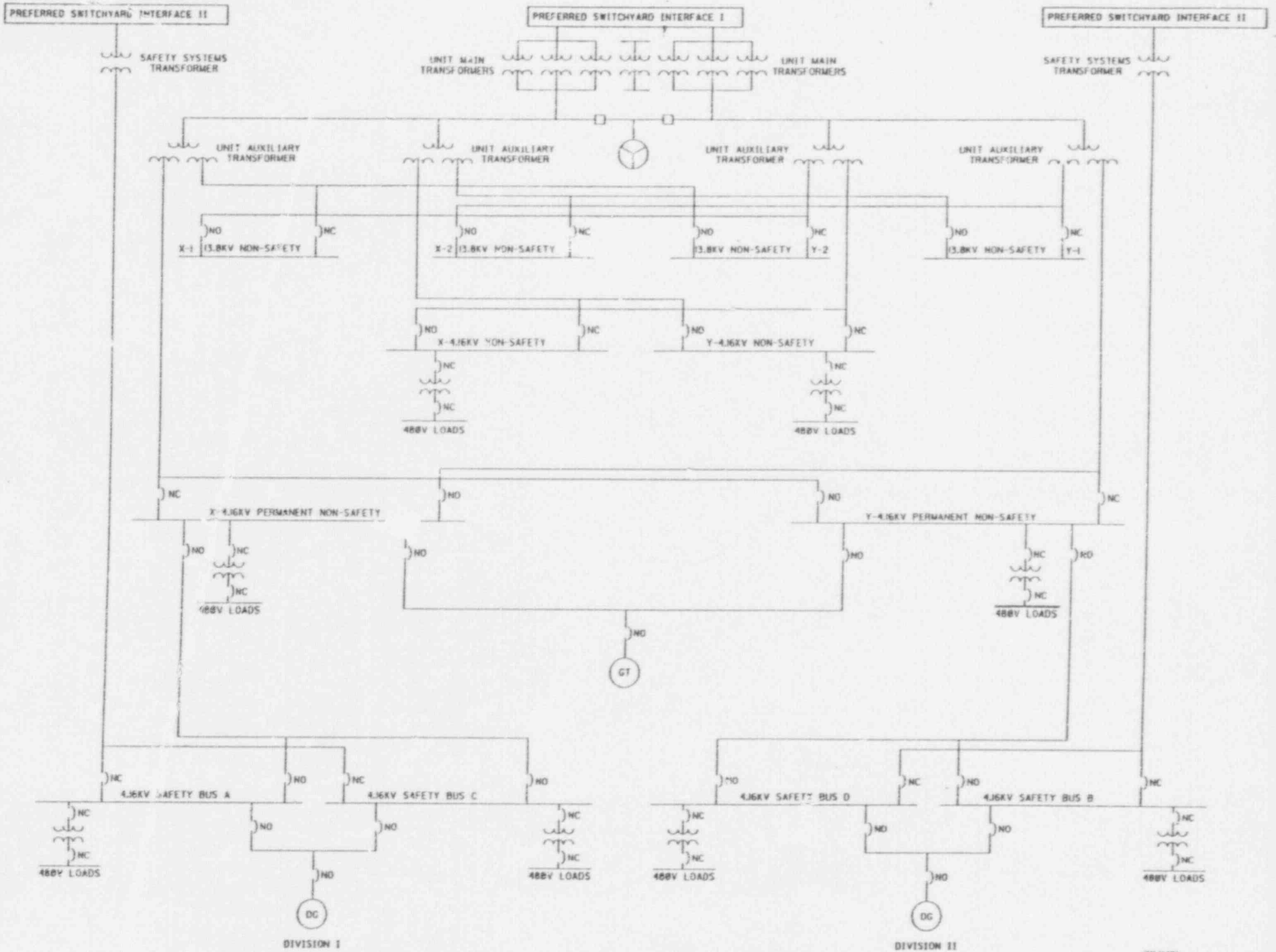
Amendment I
December 21, 1990

SYSTEM 80+™	ONSITE POWER SYSTEM ONE-LINE	Figure 8.1-1

ACRS POLICY ISSUES

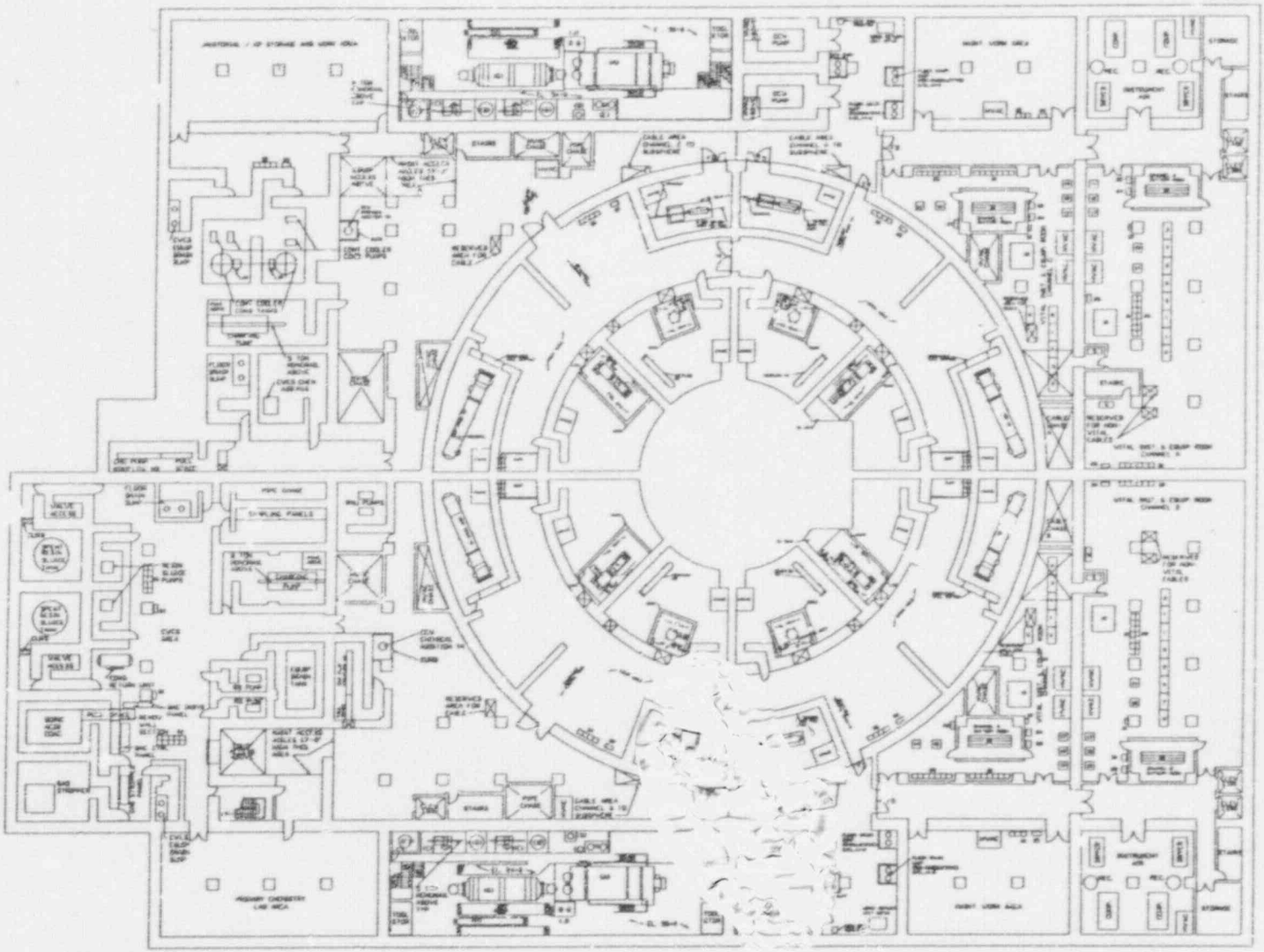
TWO POWER SOURCES TO NON-SAFETY BUSES SHOULD BE PROVIDED IN ORDER TO AVOID MINIMIZE RELIANCE ON ON NATURAL CIRCULATION AND THE SAFETY SYSTEMS FOR CORE COOLDOWN. (NRC RAI 430.9)

OFFSITE POWER SHOULD BE PROVIDED DIRECTLY TO THE SAFETY BUSES TO AVOID VOLTAGE AND POWER TRANSIENTS AND TO SEGREGATE SAFETY BUSES FROM NONSAFETY BUSES. CLASS 1E POWER SHOULD NOT HAVE TO TRANVERSE NONSAFETY BUSES TO THE SAFETY BUSES. (NRC RAI 430.10)


PREFERRED SWITCHYARD INTERFACE II
SAFETY SYSTEMS TRANSFORMER
PREFERRED SWITCHYARD INTERFACE I
UNIT MAIN TRANSFORMERS
UNIT MAIN TRANSFORMERS
PREFERRED SWITCHYARD INTERFACE II
SAFETY SYSTEMS TRANSFORMER
UNIT AUXILIARY TRANSFORMER
UNIT AUXILIARY TRANSFORMER
UNIT AUXILIARY TRANSFORMER
UNIT AUXILIARY TRANSFORMER
NO
NC
X-1 13.8KV NON-SAFETY
X-2 13.8KV NON-SAFETY
13.8KV NON-SAFETY Y-2
13.8KV NON-SAFETY Y-1
X-4.16KV NON-SAFETY
Y-4.16KV NON-SAFETY
480V LOADS
480V LOADS
X-4.16KV PERMANENT NON-SAFETY
Y-4.16KV PERMANENT NON-SAFETY
480V LOADS
480V LOADS
GT
4.16KV SAFETY BUS A
4.16KV SAFETY BUS C
4.16KV SAFETY BUS D
4.16KV SAFETY BUS B
480V LOADS
480V LOADS
480V LOADS
480V LOADS
DG
DG
DIVISION I
DIVISION II
SR4491

SYSTEM 80+ ELECTRICAL DISTRIBUTION ARRANGEMENT

- FOUR CLASS 1E BUSES
  - Supports Building General Arrangements For Quadrant Separation Of Safety Systems
  - Minimizes Cabling
  - Supports Mechanical Systems (e.g., Four SI Pumps
- FOUR 13.8 KV NON-SAFETY BUSES AND UNIT AUXILIARY TRANSFORMERS
  - Based On Plant Loads
  - Required To meet Voltage Drop/Dip And Fault Duty
  - Supports Mechanical Systems (e.g., Four RCPs)



ELEVATION 50+0 BASEMAT

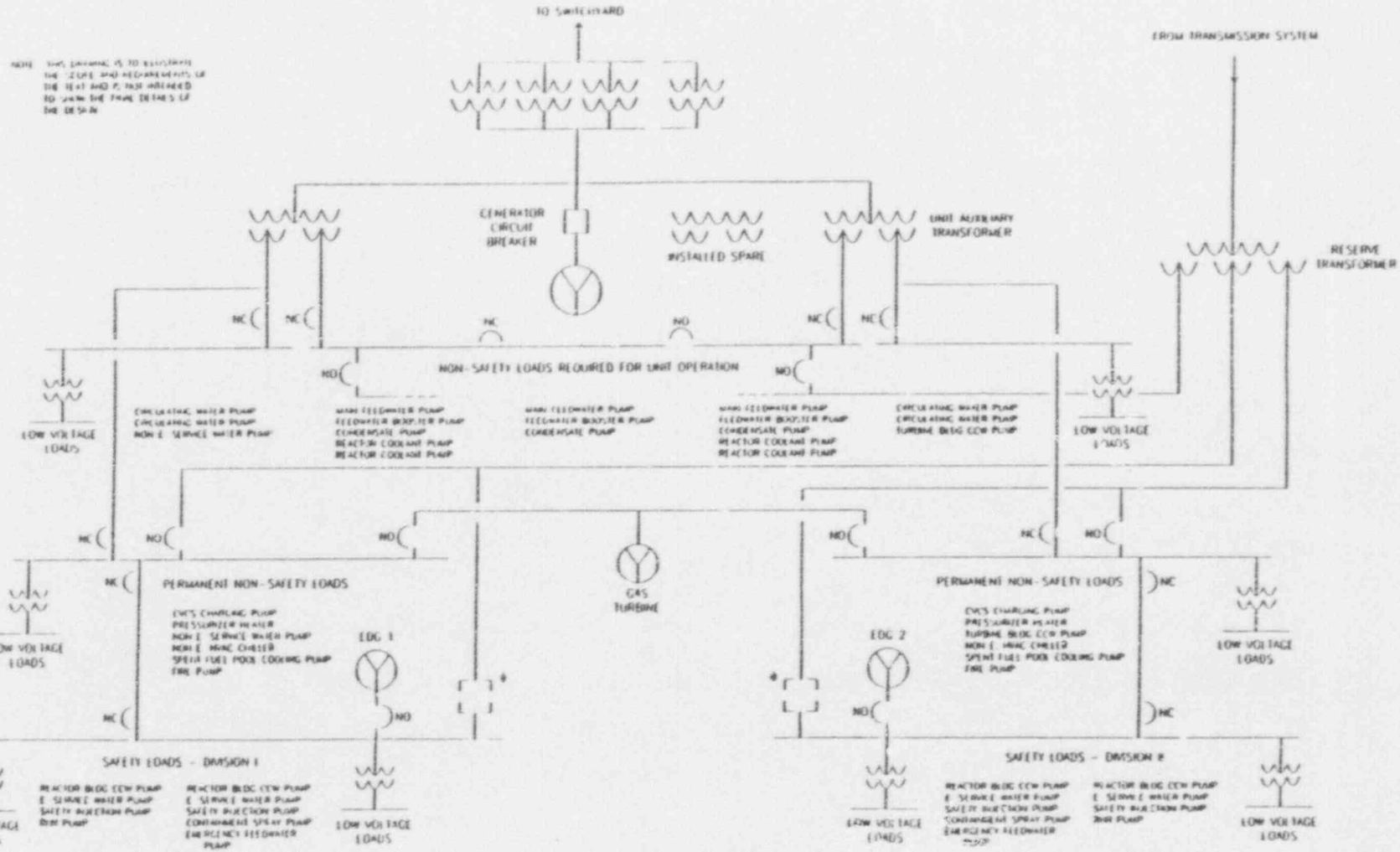
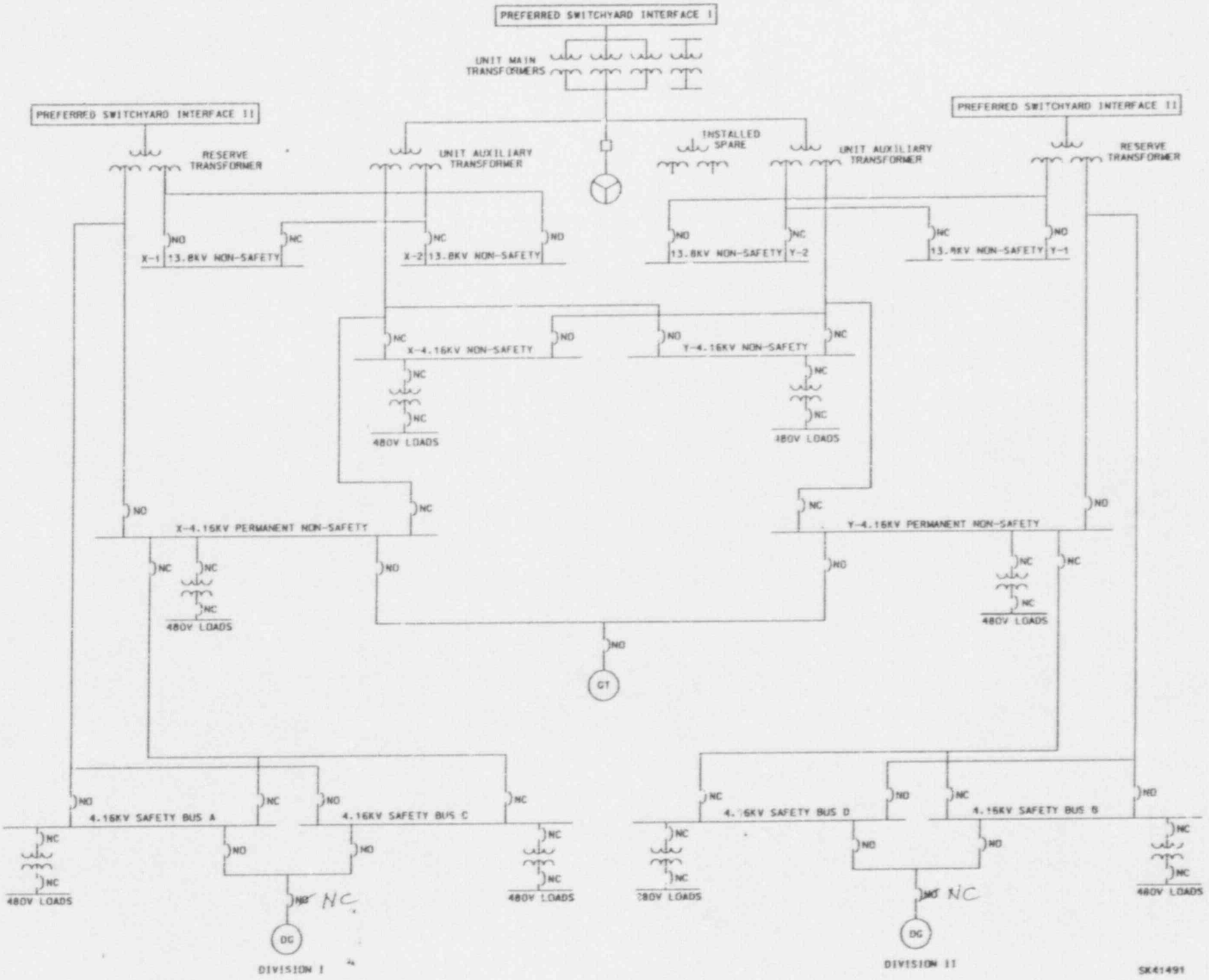


Figure 11.2-1 PWR Electrical System Configuration


PREFERRED SWITCHYARD INTERFACE I
UNIT MAIN TRANSFORMERS
PREFERRED SWITCHYARD INTERFACE II
RESERVE TRANSFORMER
UNIT AUXILIARY TRANSFORMER
INSTALLED SPARE
UNIT AUXILIARY TRANSFORMER
PREFERRED SWITCHYARD INTERFACE II
RESERVE TRANSFORMER
X-1 13.8KV NON-SAFETY
X-2 13.8KV NON-SAFETY
13.8KV NON-SAFETY Y-2
13.8KV NON-SAFETY Y-1
X-4.16KV NON-SAFETY
Y-4.16KV NON-SAFETY
480V LOADS
480V LOADS
X-4.16KV PERMANENT NON-SAFETY
Y-4.16KV PERMANENT NON-SAFETY
480V LOADS
480V LOADS
GT
4.16KV SAFETY BUS A
4.16KV SAFETY BUS C
4.16KV SAFETY BUS D
4.16KV SAFETY BUS B
480V LOADS
480V LOADS
480V LOADS
480V LOADS
NC
NC
DG
DG
DIVISION I
DIVISION II
SK41491

ELECTRICAL DISTRIBUTION SYSTEM BASES

ONE GENERATOR CIRCUIT BREAKER

THREE UNIT MAIN STEPUP TRANSFORMERS WITH ONE INSTALLED SPARE TRANSFORMER

TWO UNIT AUXILIARY TRANSFORMERS WITH ONE INSTALLED SPARE TRANSFORMER

TWO RESERVE TRANSFORMERS, EACH WITH MINIMUM CAPABILITY TO SUPPLY:

A) THE MOST CONSERVATIVE POWER REQUIREMENTS OF ITS ASSOCIATED CLASS 1E BUSES, AND

B) THE MOST CONSERVATIVE POWER REQUIREMENTS OF ITS ASSOCIATED PERMANENT NONSAFETY BUS, AND

C) POWER REQUIREMENTS FOR AT LEAST ONE REACTOR COOLANT PUMP AND ITS SUPPORT LOADS.

4.16 KV PERMANENT NONSAFETY AND 4.16 KV SAFETY BUSES RECEIVE NORMAL POWER FROM THE UNIT AUXILIARY TRANSFORMERS. PER EPRI GUIDANCE (VOLUME II, CHAPTER 11, SECTION 4.2.2), ON LOSS OF UNIT AUXILIARY TRANSFORMER FAST TRANSFER TO RESERVE TRANSFORMER OCCURS. FAST TRANSFER WILL NOT OCCUR ON LOCA/LOOP. MANUAL TRANSFER OF 4.16 KV SAFETY BUSES TO RESERVE TRANSFORMERS IS AN OPTION, SHOULD FAILURE OCCUR IN PERMANENT NONSAFETY BUS.