



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

June 26, 1991

Docket Nos. 50-325
and 50-324

LICENSEE: Carolina Power & Light Company
FACILITY: Brunswick Steam Electric Plant, Units 1 and 2
SUBJECT: SUMMARY OF JUNE 18, 1991, MEETING TO DISCUSS THE ELECTRICAL
DISTRIBUTION SYSTEMS AND PLANS TO IMPROVE OFF-SITE POWER
RELIABILITY - BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

On June 18, 1991, the NRC staff met with the licensee (Carolina Power & Light Company) to discuss electrical power supply systems at the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. The meeting attendees are listed in Enclosure 1, and the handout used during the meeting is included as Enclosure 2.

The licensee provided an overview of the current (as-built) configuration for the BSEP, Units 1 and 2, off-site and on-site power supply systems and discussed their plan for improving system reliability.

Several options to improve both on- and off-site power supplies were discussed which included: (1) installation of a new motorized main generator disconnect device to improve the availability of the delayed access power source as required by General Design Criterion-17 (GDC-17), (2) additional emergency bus transformers (e.g., additional startup transformer) with on-line tap changer, and (3) an additional alternate on-site power supply source (either a large-size, non-1E gas turbine with peaking ability or a fifth, class 1E or non-class 1E diesel generator).

The licensee represented that options (1) and (2) will enhance the off-site power availability and respond to staff concerns on GDC-17 issues, while option (3) will reduce plant risk under design basis events, as well as provide relief for the Technical Specification out-of-service time for emergency diesel generator maintenance.

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June 26, 1991

Further analyses for refining these options are being performed, and the licensee will notify the staff of their selection of one or a combination of the options discussed above by end of 1991. In either case, the licensee stated during the meeting that they intend to meet the current GDC-17 requirements.

Original Signed By

Ngoc B. Le, Project Manager
Project Directorate II-1
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc: w/enclosures
See next page

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DATE	: 7/17/91	: 7/25/91	: 7/26/91	:	:

OFFICIAL RECORD COPY
Document Name: MEETING SUMMARY BSEP

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Carolina Power & Light Company

Brunswick Steam Electric Plant
Units 1 and 2

cc:

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DISTRIBUTION

Docket File
NRC & Local PDR's
F. Miraglia
J. Partlow
S. Varga
G. Lainas
N. Le
OGC
A. Thadani 8-E-2
P. Gill 7-E-4
C. Grimes 9-A-2
S. Flanders
C. Schuler
P. Kang 7-E-4
M. Shymlock, RII
S. Richards
J. Knight 7-E-4
M. Markley 10-H-11
R. Architzel 8-D-1
W. Levis RII
D. Verrelli RII
C. Christensen RII
E. Jordan
ACRS (10)
J. Wechselberger RII
Brunswick Plant File

cc: Licensee & Service List

CP&L/NRC MEETING

June 18, 1991

Names

Tommy Le
Stephen D. Floyd
J. Morris Brown
Ken Karr
Russ Starkey, Jr.
R. A. Watson
Ashok Thadani
Gus Lainas
Paul Gill
Anthony Mendiola
C. I. Grimes
Scott Flanders
Carl Schulten
Peter Kang
W. Levis
Mike Jackson
Milton Shymlock
Stuart Richards
Jim Knight
Michael Markley
Ralph Architzel
Gerald Vaughn

Organizations

NRC
CP&L
CP&L
CP&L
CP&L
CP&L
NRR
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CAROLINA POWER & LIGHT COMPANY

BRUNSWICK ELECTRICAL DISTRIBUTION SYSTEM

PRESENTATION TO

NUCLEAR REGULATORY COMMISSION

JUNE 18, 1991

BRUNSWICK ELECTRICAL DISTRIBUTION SYSTEM

AGENDA

- I. MEETING OBJECTIVES

- II. BRUNSWICK ELECTRICAL DISTRIBUTION SYSTEM CONFIGURATION
 - A. OFF-SITE POWER DISTRIBUTION
 - B. ON-SITE POWER DISTRIBUTION

- III. OFF-SITE POWER RELIABILITY
 - A. HISTORICAL PERSPECTIVE
 - B. CANDIDATE ENHANCEMENTS
 - C. ACTION PLAN

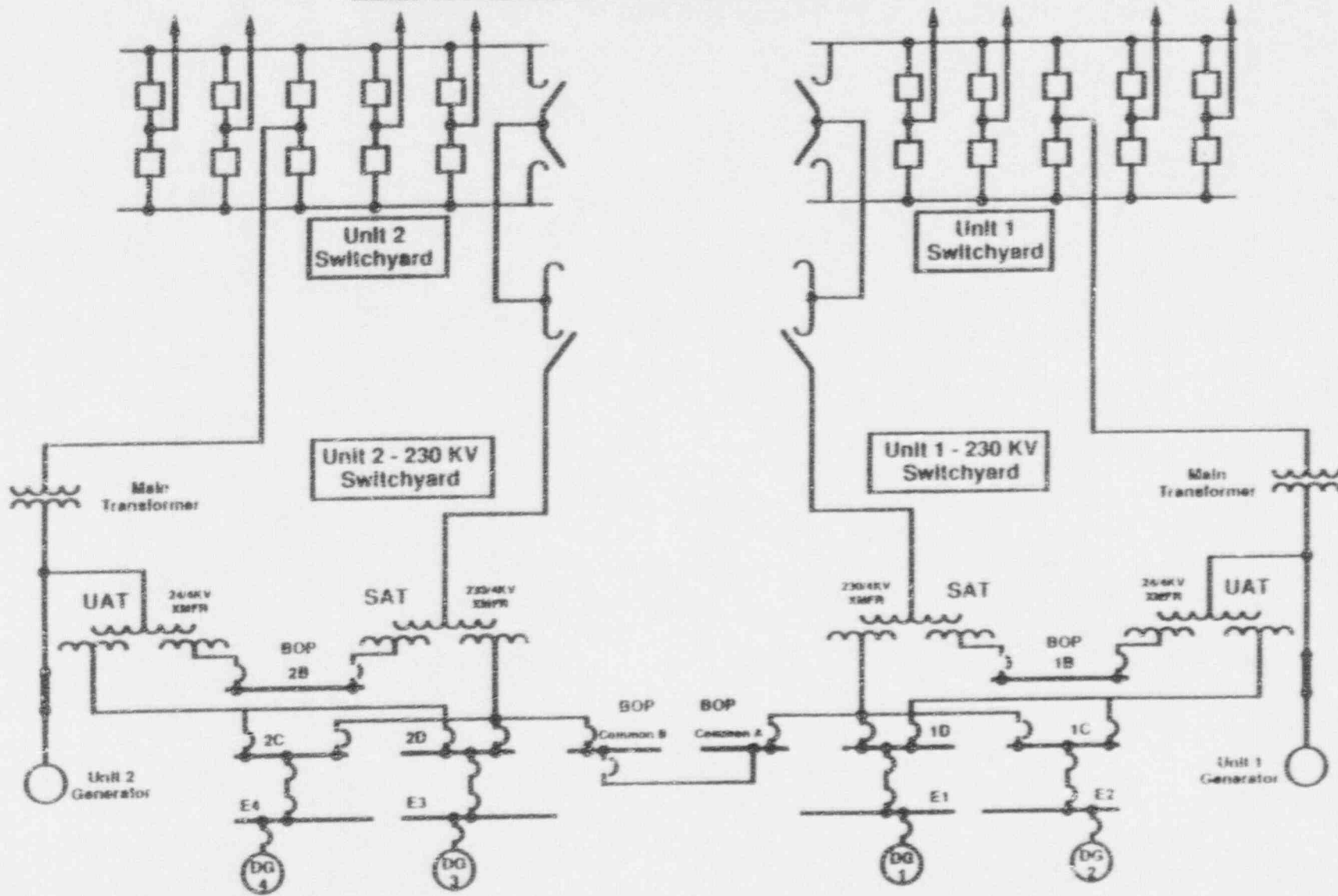
- IV. SUMMARY

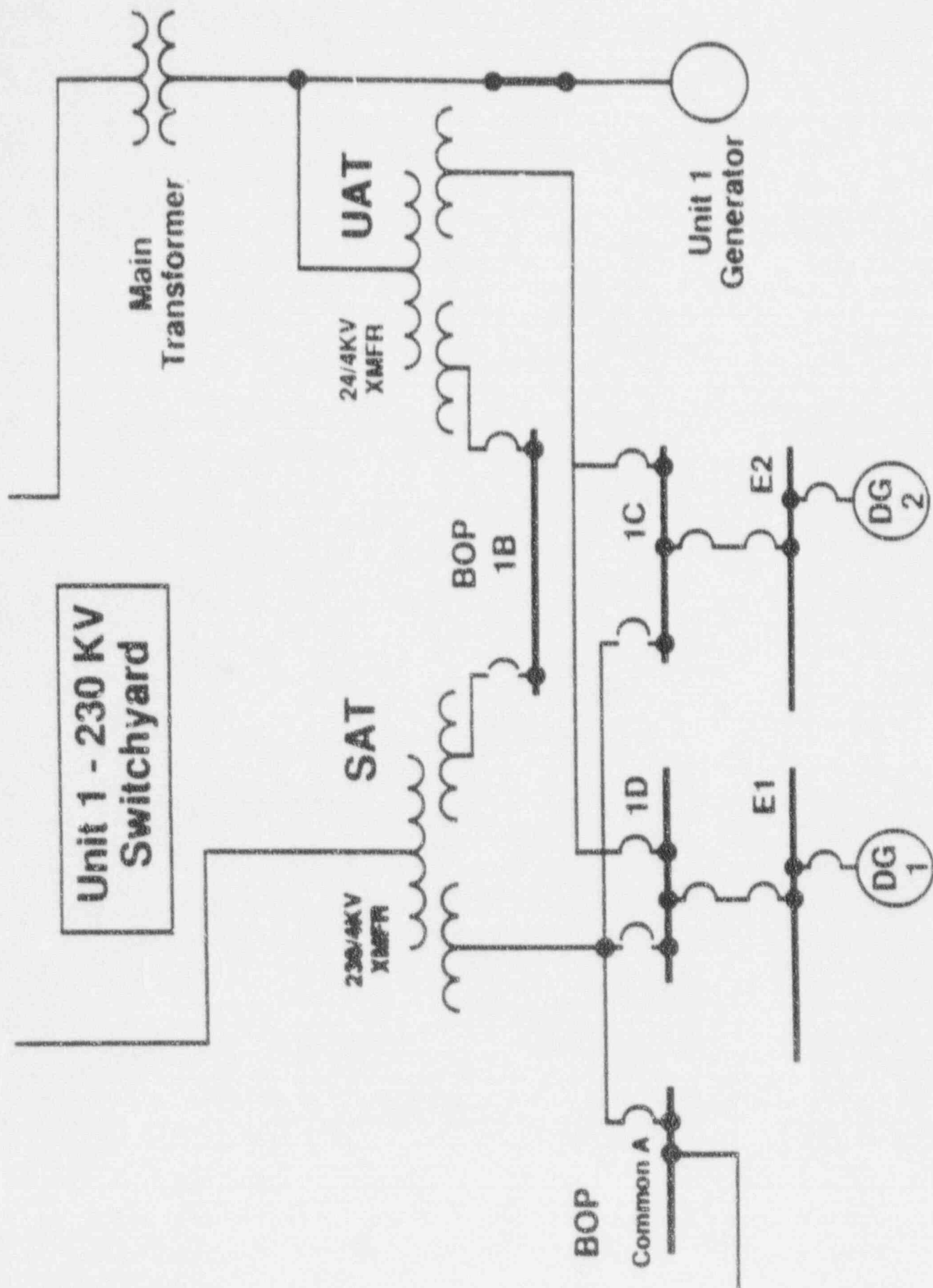
MEETING OBJECTIVES

- A. PROVIDE OVERVIEW OF THE BRUNSWICK OFF-SITE AND ON-SITE ELECTRICAL DISTRIBUTION SYSTEMS.

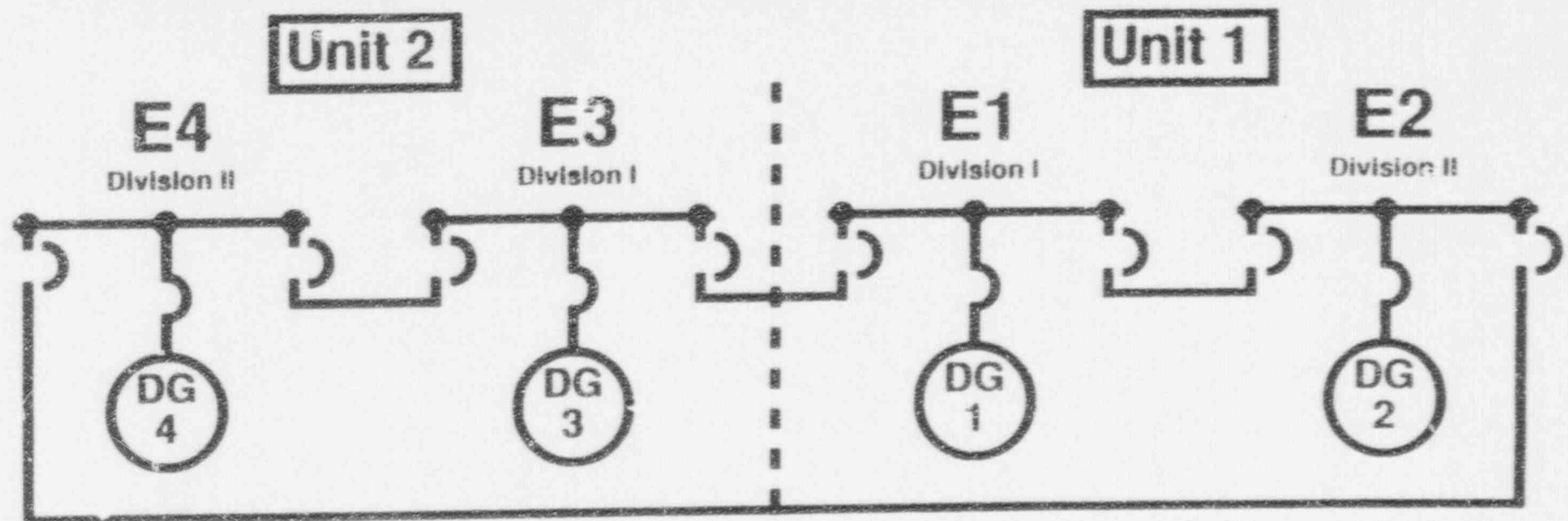
- B. DISCUSS CP&L'S PLANS TO IMPROVE OFF-SITE POWER RELIABILITY.

Electrical Distribution System





Diesel Generator Emergency Power System



E4 Equipment

NSW Pump 2B Motor
RHR Pump 2B Motor
CS Pump 2B Motor
Fire Pump Motor

RHR Pump 1B Motor

CSW Pump 2B Motor
RHR SW Pump 2B Motor
RHR SW Pump 1B Motor
CSW Pump 1A Motor

E3 Equipment

NSW Pump 2A Motor
RHR Pump 2A Motor
CS Pump 2A Motor

RHR Pump 1A Motor

CSW Pump 2A Motor
RHR SW Pump 2A Motor
RHR SW Pump 1A Motor

E1 Equipment

NSW Pump 1A Motor
RHR Pump 1C Motor
CS Pump 1A Motor

RHR Pump 2C Motor

CSW Pump 1B Motor
RHR SW Pump 1C Motor
RHR SW Pump 2C Motor
CSW Pump 2C Motor

E2 Equipment

NSW Pump 1B Motor
RHR Pump 1D Motor
CS Pump 1B Motor
Fire Pump Motor

RHR Pump 2D Motor

CSW Pump 1C Motor
RHR SW Pump 1D Motor
RHR SW Pump 2D Motor

Diesel Generator Capacity

Continuous Rating

3,500 KW

2,000 Hour/Year Rating

3,850 KW

Worst Case Loading

3,428 KW

% of Continuous Rating

98%

% of 2,000 Hour/Year Rating

89%

Electrical Distribution Concerns

- **Non-Segregated Bus Duct Loading**
- **Switchyard Voltage**
- **Timely UAT Backfeed**

OFF-SITE POWER RELIABILITY

A. HISTORICAL PERSPECTIVE

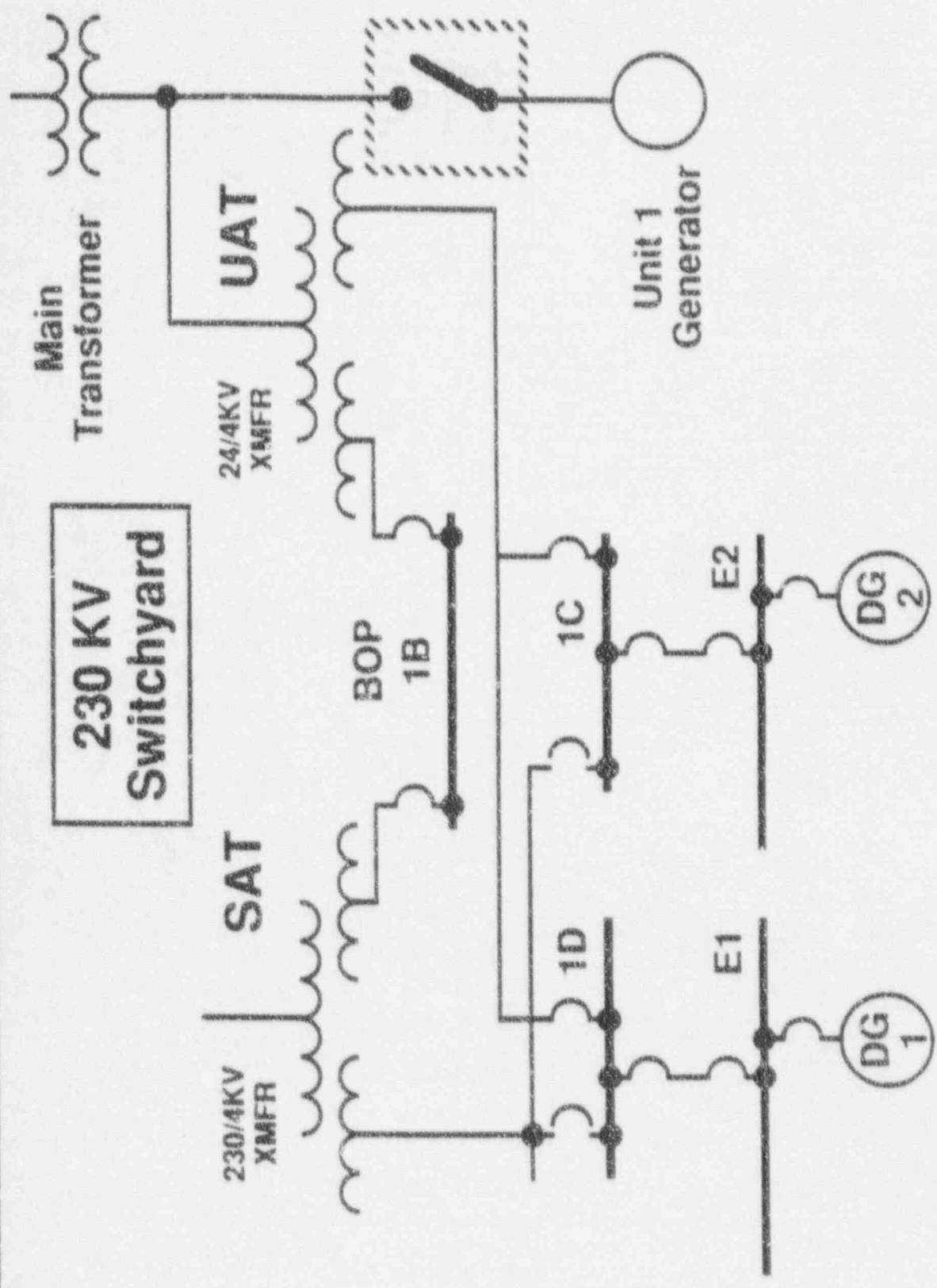
1. FOCUS OF GDC-17 AT TIME OF BRUNSWICK LICENSE WAS ON TRANSMISSION LINES (NUMBER, SEPARATION, INDEPENDENCE, ETC.).
2. PLANT DESIGNED TO MEET IEEE 308-1971, WHICH REQUIRED SECOND OFF-SITE CIRCUIT TO BE AVAILABLE WITHIN EIGHT HOURS.

B. CANDIDATE ENHANCEMENTS

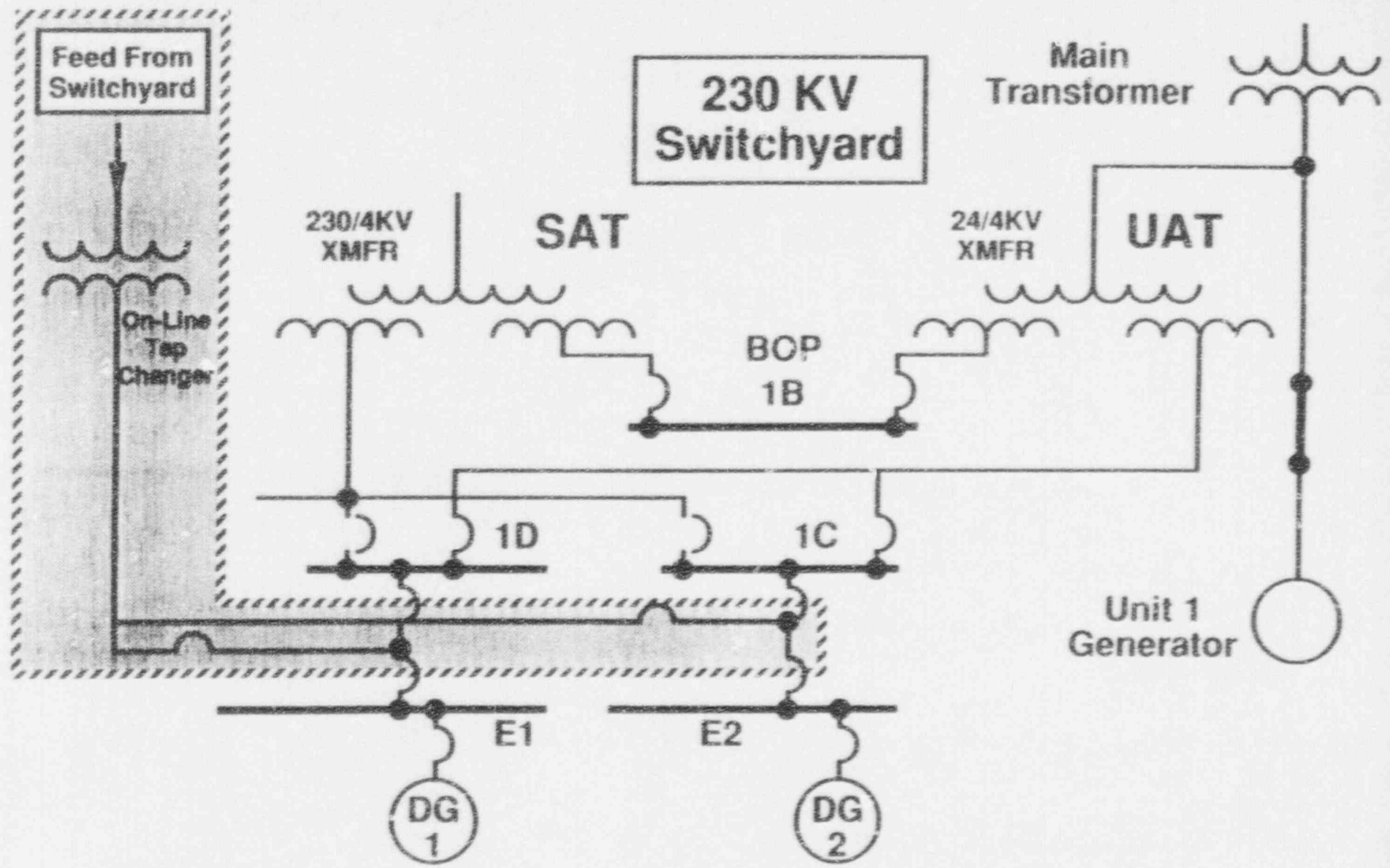
1. CP&L ASSEMBLED TASK FORCE TO EXPLORE POTENTIAL OFF-SITE POWER RELIABILITY ENHANCEMENTS.
 - FOCUS ON TIMELINESS OF AVAILABILITY OF SECOND CIRCUIT
 - MINIMIZE COMPLEXITY OF ENHANCEMENT
2. TASK FORCE RESULTS.

	ENHANCES OFF-SITE POWER RELIABILITY	COST RANGE
1. MAIN GENERATOR DISCONNECT LINKS	YES	\$8-10M
2. ADDITIONAL SATs	YES	\$15-30M
3. NON-1E IC TURBINE	NO	\$30-40M
4. NON-1E DIESEL	NO	\$13-15M
5. CLASS 1E DIESEL	NO	\$80-100M

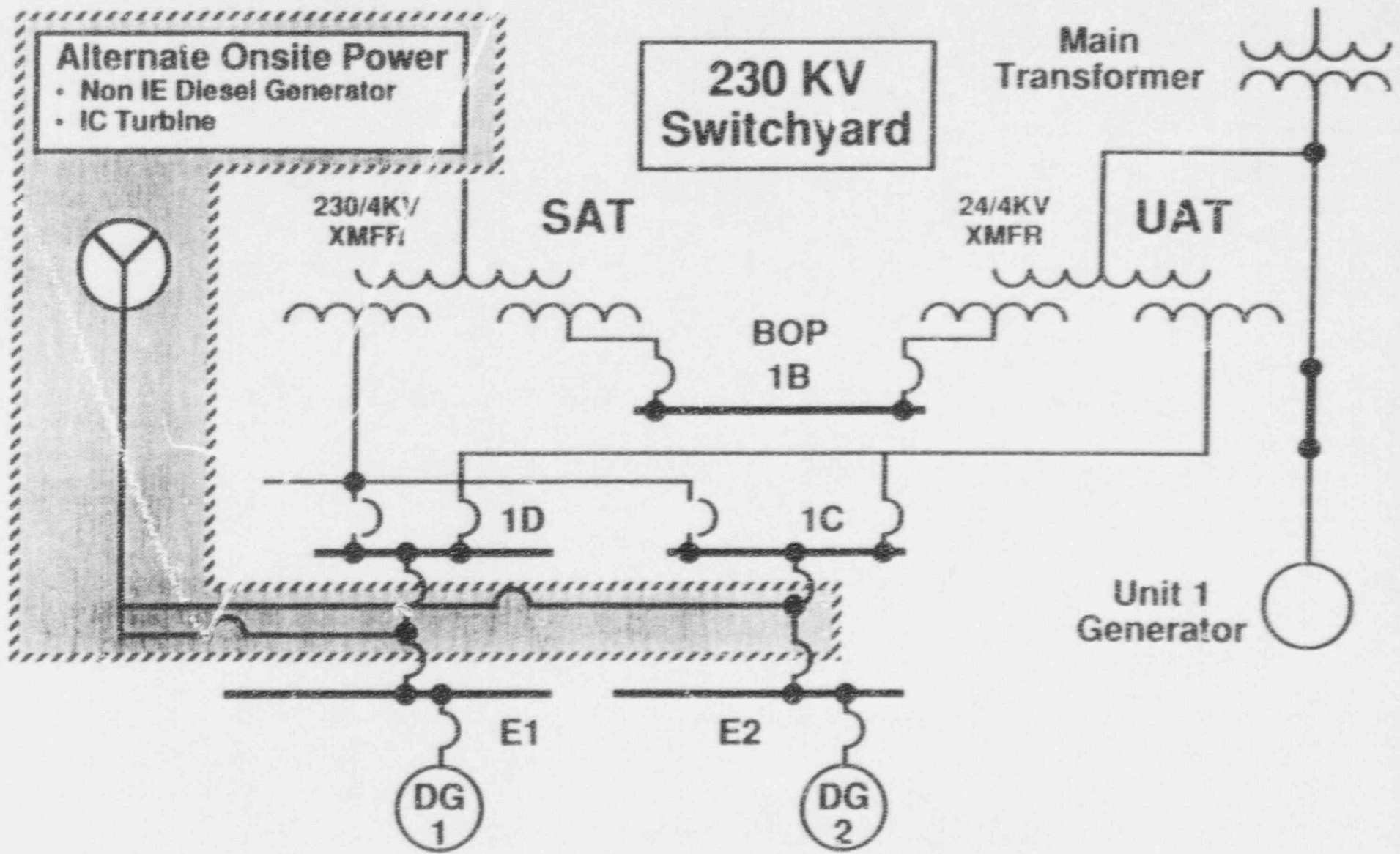
Option 1 - Motorized Disconnect Device



Option 2 - Additional Emergency Bus Transformer



Option 3 - Additional Power Source

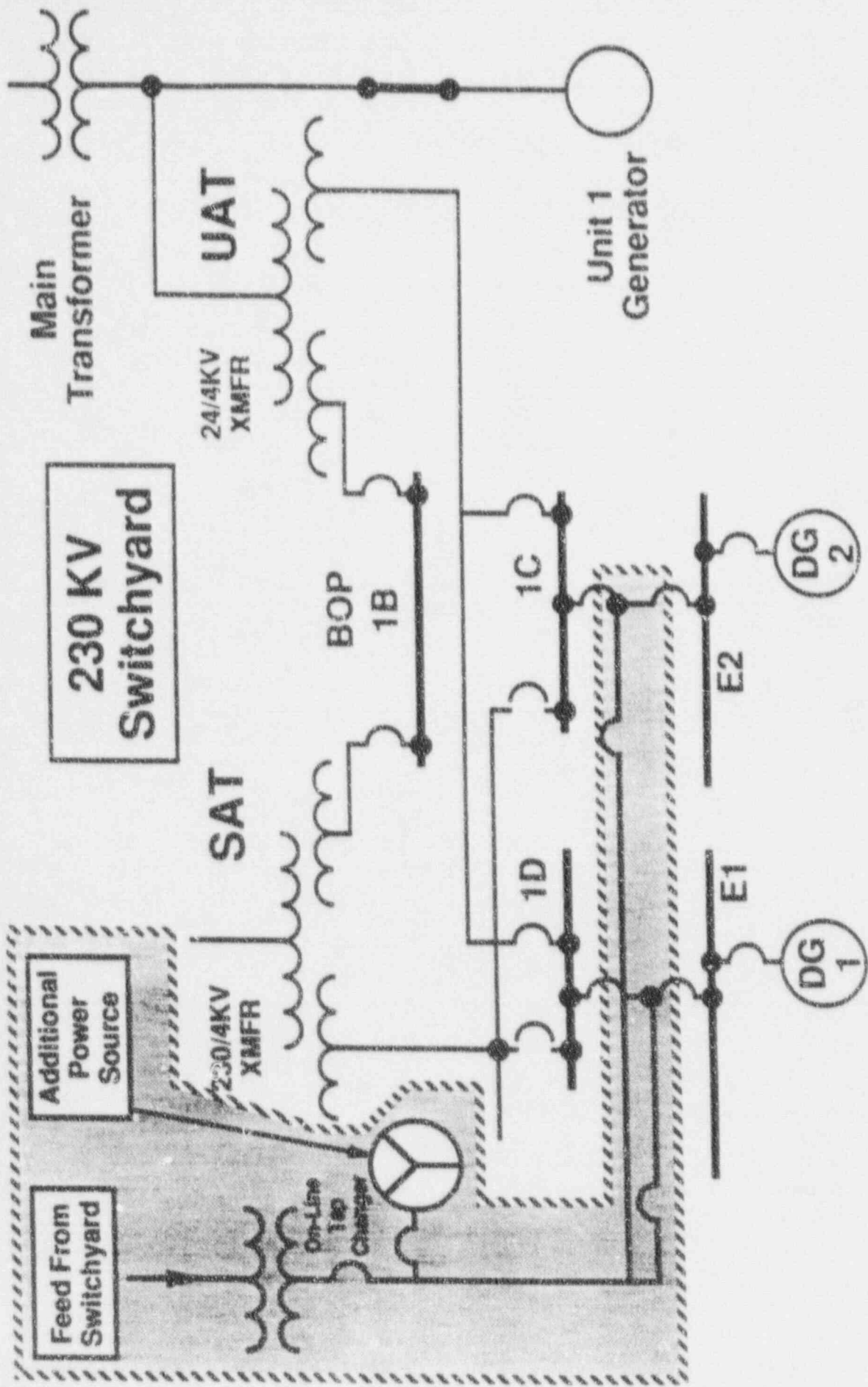


OFF-SITE POWER RELIABILITY (CONTINUED)

C. ACTION PLAN

1. FURTHER ANALYSES NEEDED TO REFINE OPTIONS.
 - ENGINEERING
 - TECHNICAL FEASIBILITY
 - MINIMIZE IMPACT ON EXISTING SYSTEM
 - PROACTIVELY ADDRESS KNOWN AND FUTURE ELECTRICAL ISSUES (GRID VOLTAGE, NONSEGREGATED BUS DUCT, FUTURE TRANSMISSION NEEDS)
 - RISK MANAGEMENT
 - EVALUATE BENEFITS OF OPTIONS
 - EVALUATE OPPORTUNITIES TO EXTEND EDG MAINTENANCE DURING OUTAGES
2. CP&L WILL IMPLEMENT AN OPTION THAT ENHANCES OFF-SITE POWER CONFIGURATION.
3. SELECTED OPTION TO BE IDENTIFIED BY END OF 1991.
 - NRC NOTIFIED OF SELECTION
 - SCHEDULE FOR MODIFICATION

Option 4 - Combination Offsite / Onsite



ADDITIONAL ON-SITE AC POWER SOURCE

ADVANTAGES

1. PROVIDES BACK-UP SOURCE OF POWER TO AN INOPERABLE EDG
2. REDUCES RISK
 - SHUTDOWN RISK
 - IMPROVES OPERATOR RESPONSE TO APPENDIX R AND STATION BLACKOUT SCENARIOS
 - ENHANCES ACCIDENT MANAGEMENT CAPABILITY
3. LARGE CAPACITY SOURCE CAN POWER BOP AND E-BUS LOADS - PROVIDES OPERATOR SHUTDOWN FLEXIBILITY

DISADVANTAGES

1. ADDITIONAL MAINTENANCE REQUIREMENTS
2. NEW PROCEDURE AND TRAINING FOR OPERATORS
3. REGULATORY CREDIT FOR NON-1E SOURCE UNCERTAIN
4. EXPENSIVE