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

April 12, 1991

Docket Nos.: 50-277/278

LICENSEE: Philadelphia Electric Company, et. al.

FACILITY: Peach Bottom Atomic Power Station, Units 2 and 3

SUBJECT: SUMMARY OF APRIL 5, 1991 MEETING ON STATION BLACKOUT (TAC NOS. 68582 AND 68583)

On April 5, 1991, the NRC staff met with Philadelphia Electric Company representatives at the NRC offices in Rockville, MD, to discuss the licensee's revised station blackout analysis and to discuss staff positions presented in the staff's February 7, 1991 response to the licensee's January 8, 1991 backfit claim on station blackout issues. (In the 2-7-91 letter, the NRC staff concluded that its positions were consistent with the station blackout rule and relevant NRC guidance, and determined that the staff's positions did not constitute backfits.) The revised analysis reflected new information and licensee commitments which resulted from a March 12, 1991 meeting on emergency diesel generator (EDG) ratings. Specifically, the licensee had committed to maintain EDG loads within the 2000-hr EDG rating of 3000 kW. Enclosure 1 provides a list of the meeting participants. Enclosure 2 provides a copy of the licensee's meeting handouts. Meeting highlights are described in the following.

The licensee presented a summary of its revised station blackout analysis which indicates that any two of the four shared EDGs at the station can support safe shutdown loads for both units during a loss of offsite power (LOOP) event. Various operator actions such as backfeeding 4.16 kV safety buses and limited load management (load shedding) actions were assumed in the analysis. In addition, during the station blackout scenario, one of the four EDGs would be available as an alternate ac power source to support operator actions in coping with the postulated 8-hour station blackout duration, and the suppression pools of both units would be allowed to heat up with no active cooling. The licensee's analysis indicates that containment integrity and net positive suction head requirements for subsequent recovery activities would be met. The licensee's presentation also included a discussion of the offsite electrical distribution system which is interconnected with the PJM 500-kV grid system.

The staff indicated that there did not appear to be any fundamental flaws in the licensee's analytical approach. However, the staff requested detailed information (including the revised station blackout analysis) to allow staff review and evaluation of the various technical issues, in areas such as transformer losses, the minimum required loads for LOOP and station blackout, the analysis of suppression pool temperatures and pressures, and operator actions required for responding to a LOOP event. In addition, NRC staff and contractor personnel raised various technical questions during the course of the licensee's presentation which will need to be considered during the staff's review of the revised station blackout analysis. These questions dealt with issues such as the adequacy of the condensate storage tank inventory, LOOP safe shutdown loads, instrument air capabilities, and the analytical assumptions for recirculation pump seal leakage.

The licensee committed to provide its schedule for submitting a revised station blackout response by April 8. The licensee indicated that it plans to submit the revised station blackout response in late April. On a separate but related item, the licensee stated that it will submit a letter by April 15 documenting its revised design basis EDG loading profiles and commitments related to diesel generator ratings as discussed in a March 12, 1991 meeting with the staff. (The licensee's commitments are documented in a March 25, 1991 Meeting Summary.)

/S/

Gene Y. Suh, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II

Enclosures:
1. List of Participants
2. Meeting Handouts

cc w/enclosures:
See next page

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GHolahan, E-2
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AToalston, 7E-4
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ACRS (10)
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KBrockman, 17G21

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Project Directorate I-2
Division of Reactor Projects - I/II

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Philadelphia Electric Company

cc:

J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Philadelphia Electric Company
ATTN: Mr. D. B. Miller, Vice President
Peach Bottom Atomic Power Station
Route 1, Box 208
Delta, Pennsylvania 17314

Philadelphia Electric Company
ATTN: Regulatory Engineer, A1-2S
Peach Bottom Atomic Power Station
Route 1, Box 208
Delta, Pennsylvania 17314

Resident Inspector
U.S. Nuclear Regulatory Commission
Peach Bottom Atomic Power Station
P.O. Box 399
Delta, Pennsylvania 17314

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Mr. Roland Fletcher
Department of Environment
201 West Preston Street
Baltimore, Maryland 21201

Single Point of Contact
P. O. Box 11880
Harrisburg, Pennsylvania 17108-1880

Mr. Thomas M. Gerusky, Director
Bureau of Radiation Protection
Pennsylvania Department of
Environmental Resources
P. O. Box 2063
Harrisburg, Pennsylvania 17120

Board of Supervisors
Peach Bottom Township
R. D. #1
Delta, Pennsylvania 17314

Public Service Commission of Maryland
Engineering Division
ATTN: Chief Engineer
231 E. Baltimore Street
Baltimore, MD 21202-3486

Mr. Richard McLean
Power Plant and Environmental
Review Division
Department of Natural Resources
B-3, Tawes State Office Building
Annapolis, Maryland 21401

Mr. George J. Beck
Manager-Licensing, MC 5-2A-5
Philadelphia Electric Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, Pennsylvania 19087-0195

ENCLOSURE 1

NRC/PECo APRIL 5, 1991 MEETING ON
STATION BLACKOUT

NAME	ORGANIZATION
A. Thadani	NRC/NRR/DST
G. Holahan	NRC/NRR/DST
J. Calvo	NRC/NRR/DRPE
W. Butler	NRC/NRR/DRPE
F. Rosa	NRC/NRR/DST
J. Knight	NRC/NRR/DST
P. Gill	NRC/NRR/DST
R. Karimi	SAIC
A. Toalston	NRC/NRR/DST
G. Suh	NRC/NRR/DRPE
D. Helwig	PECo
M. Gallagher	PECo
M. Kray	PECo/Licensing
R. Krich	PECo/Licensing
W. Mindick	PECo/NED
G. Gellrich	PECo/Peach Bottom
J. Basilio	PECo/Licensing
J. Coyle	PECo/Peach Bottom
G. Cranston	PECo/NED
S. Maingi	Commonwealth of Pennsylvania

ENCLOSURE 2

PEACH BOTTOM ATOMIC POWER STATION

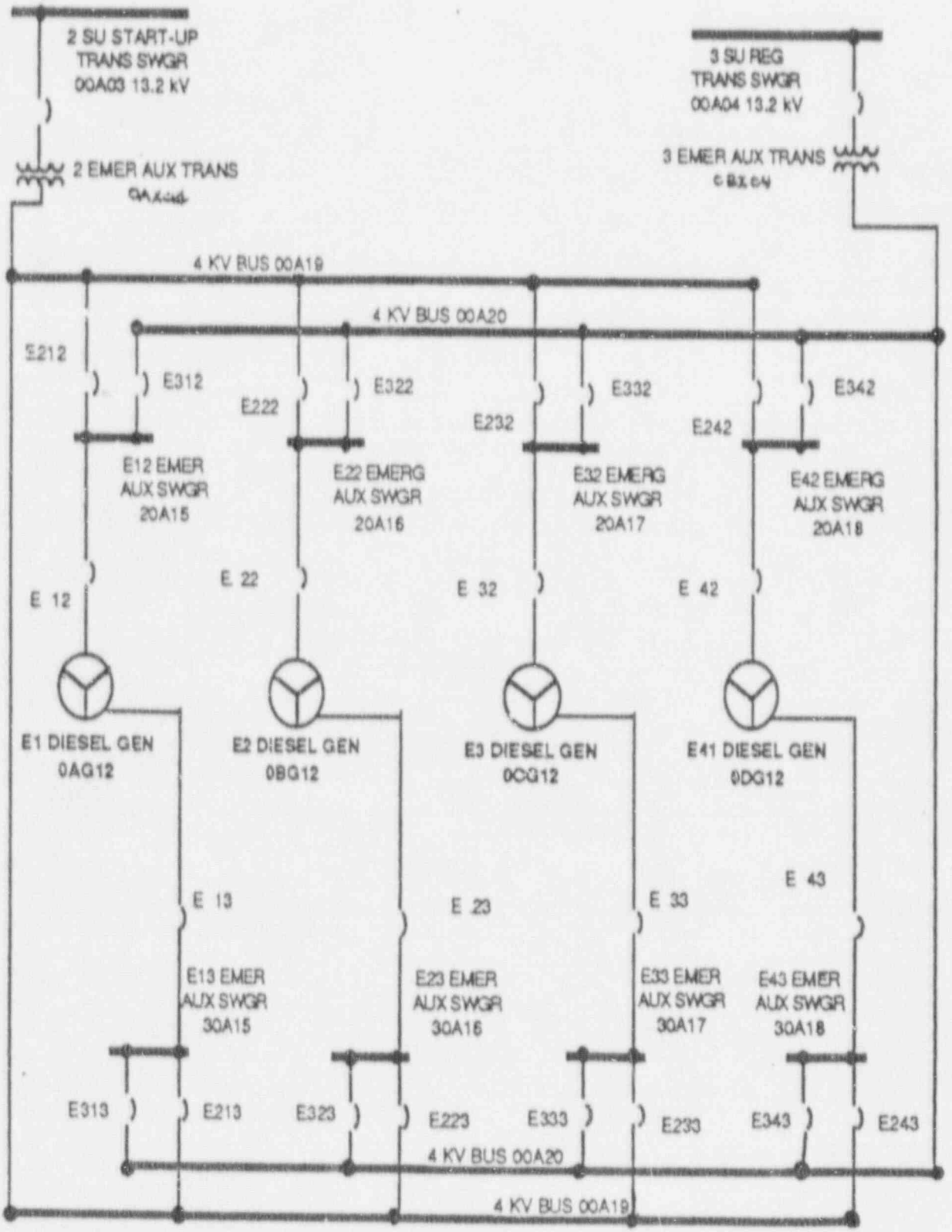
STATION BLACKOUT PRESENTATION

PHILADELPHIA ELECTRIC CO.
APRIL 5, 1991

AGENDA

TOPIC	PRESENTER
INTRODUCTION	D. R. HELWIG
ELECTRICAL SYSTEM	W. J. MINDICK
EAC DETERMINATION	M. P. GALLAGHER
SBO CONFIGURATION	M. P. GALLAGHER
SUMMARY	D. R. HELWIG

STATION ONE-LINE DIAGRAM



ELECTRICAL DISTRIBUTION SYSTEM

TWO OFFSITE SOURCES
- 220kV GRACETON-NOTTINGHAM
- 500/220kV NORTH & SOUTH SUBS
  - SALEM, HOPE CREEK,
  - LIMERICK, TMI,
  - KEYSTONE, CONAMAUGH,
  - NEWLINVILLE SUB,
  - MUDDY RUN
- IMMEDIATE ACCESS
- COMMON TO BOTH UNITS
- AUTO-TRANSFER

DG - SHARED BETWEEN UNITS

- NEITHER UNIT LOSES OFFSITE UNLESS BOTH SOURCES ARE LOST
- LOSS OF ONE OFFSITE SOURCE IS INCONSEQUENTIAL
- BOTH OFFSITE SOURCES NEED TO BE LOST TO CAUSE A LOOP
- LOOP EFFECTS BOTH UNITS
- LOSS OF EDG RESULTS IN LOSS OF BUS IN BOTH UNITS

DETERMINE # OF EDG'S REQUIRED FOR EAC

REG GUIDE 1.155 TABLE 3

"THE NUMBER OF EAC POWER SOURCES REQUIRED IS BASED ON ALL THE AC LOADS REQUIRED TO REMOVE DECAY HEAT (INCLUDING AC- POWERED DECAY HEAT REMOVAL SYSTEMS) TO ACHIEVE AND MAINTAIN SAFE SHUTDOWN AT ALL UNITS AT THE SITE WITH OFFSITE POWER UNAVAILABLE."

DETERMINE # OF EDG'S REQUIRED FOR EAC

NUMARC 87-00 p 3-15

"THE NUMBER OF EAC STANDBY POWER SOURCES NECESSARY TO OPERATE SAFE SHUTDOWN EQUIPMENT MAY BE LESS THAN THAT REQUIRED FOR LOCA LOADS."

"THE NUMBER OF NECESSARY EAC STANDBY POWER SOURCES SHOULD BE DETERMINED BY ACCOUNTING FOR THE INDIVIDUAL SAFE SHUTDOWN LOADS, OR INFERRED FROM THE SITE'S DESIGN BASIS FOR OPERATING CLASS 1E AC EQUIPMENT WITHOUT OFFSITE AC POWER."

REQUIRED LOOP LOADS

- RHR & HPSW - 1 PER UNIT
- ESW
- EMERGENCY LIGHTING
- EDG FUEL OIL XFER PUMP - 1 PER EDG
- BATTERY CHARGING
- INSTRUMENT AC
- ESSENTIAL HVAC

2 EDG'S NECESSARY FOR SAFE SHUTDOWN FOR BOTH UNITS

- ALL SIX CASES ANALYZED
  LIMITING CASE: E1 - 2722 kW
  E3 - 2995 kW

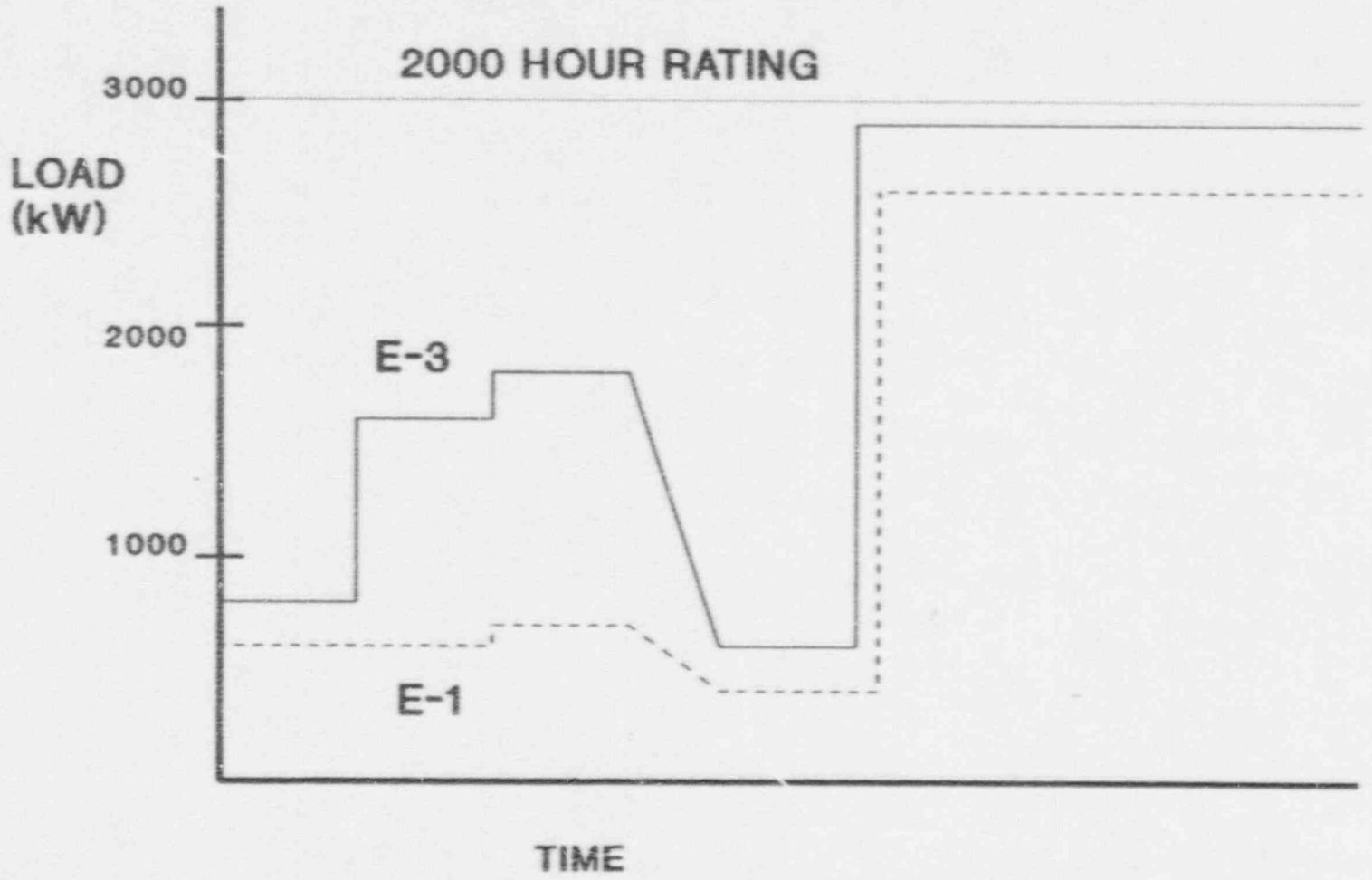
- ALL CASES WITHIN 2000 HR RATING
  (~~300~~ 3000 kW) OF EDG

- MODEST NUMBER OF OPERATOR ACTIONS

OPERATOR ACTIONS

ACTION	LOCATION	TIMING
•BACKFEED SELECTED 4kV BUSES	CONTROL ROOM/ SWGR ROOM	WITHIN 1 HOUR
•BATTERY CHARGER XFER SWITCHES	SWGR ROOM	
•LOAD MANAGEMENT		
SELECTED MCC'S	LOAD CENTERS(2 OR 3)	BEFORE STARTING RHR
RBCCW PUMPS	CONTROL ROOM	
D/W COOLER FANS	•	
SGTS	•	
INST AIR COMP	•	
MAIN TURB. AUX.	•	
STACK DIL FANS	•	
•START RHR & HPSW	CONTROL ROOM	BEFORE 8 HRS

E1 & E3 LOOP LOAD PROFILES



EAC CONCLUSIONS

- 2 EDG'S ARE REQUIRED TO MAINTAIN LONG TERM SAFE SHUTDOWN FOR BOTH UNITS
- 3 EDG'S PROVIDE THE REQUIRED REDUNDANCY
- DEMONSTRATED THAT A MODEST NUMBER OF OPERATOR ACTIONS ARE NEEDED

THEREFORE,

- PBAPS BLACKOUT DURATION IS 8 HOURS
- ANY 1 EDG IS THE AAC

SBO CONFIGURATION

- 1 EDG IS THE AAC / SATISFIES NUMARC 87-00
- SBO LOADS ARE LESS THAN THE 2000 HR EDG RATING (3000 kW)
- NO RHR/HPSW NEEDED
  ALL CONTAINMENT PARAMETERS ARE WITHIN DESIGN FOR THE 8 HR COPING PERIOD AND RECOVERY
- MINIMAL OPERATOR ACTIONS
  BACKFEED ALL 4 KV BUSES
  NO LOAD MANAGEMENT REQUIRED