

DOCUMENT TRANSMITTAL FORM 89978
FOR DOCUMENTS TRANSMITTED TO DC DESK(NRC)*

DATE: 20 Apr 1993
BATCH: 100

DOCUMENT NUMBER -----	SHEET NUMBER -----	REVISION NUMBER -----	COPY NUMBER -----
AP 770		18	7
AP 790		07	7

INSTRUCTIONS TO THE ADDRESSEE

COMPLETE EACH OF THE INSTRUCTIONS BELOW WHICH ARE MARKED WITH AN " X "

- ☒ (1) VERIFY THE DOCUMENTS RECEIVED AGREE WITH THE ABOVE DESCRIPTION
- ☒ (2) INCORPORATE THE TRANSMITTED DOCUMENTS INTO YOUR FILES
- ☒ (3) DESTROY DOCUMENTS OR PORTIONS OF DOCUMENTS SUPERSEDED BY THE ABOVE
- ☒ (4) SIGN AND DATE IN THE SPACES BELOW INDICATING THAT YOU COMPLETED THESE INSTRUCTIONS.
- ☐ (5) SIGN BELOW INDICATING THAT YOU HAVE READ AND UNDERSTOOD THE CHANGES AS IDENTIFIED
- ☒ (6) RETURN TO DOCUMENT CONTROL, CRYSTAL RIVER UNIT 3, MAC# NA1C _____
NR2A _____ SA1G _____ FLORIDA POWER CORP., P.O. BOX 219
CRYSTAL RIVER FLA. 32623
- ☐ (7) QUALITY PROGRAMS PERSONNEL HAVE READ AND UNDERSTOOD THE CHANGES TO THE AFFECTED QAF'S

SIGNATURE OF ADDRESSEE _____

DATE _____

INDEPENDENT VERIFICATION _____

DATE _____

(OPS)

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AD45 9/1

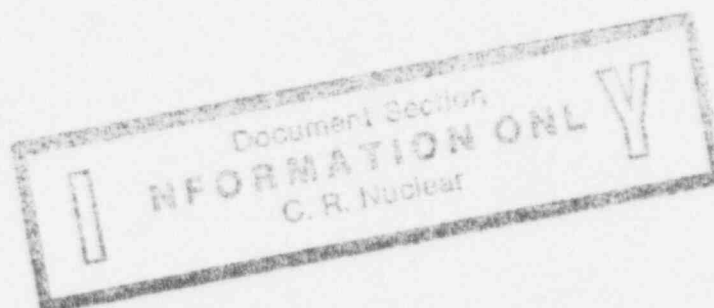
EDGA	REV 18	DATE 04/15/93	AP-770
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EMERGENCY DIESEL GENERATOR ACTUATION

1.0 ENTRY CONDITIONS

IF 4160V ES Bus undervoltage occurs,

THEN use this procedure.



This Procedure Addresses Safety Related Components		
Approved by MNPO <i>RD Tyrie for W.M.M.</i> Date <i>4-16-93</i>		
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2.0 IMMEDIATE ACTIONS

ACTIONS

DETAILS

Note

There are no Immediate Actions for this procedure.

Table 1: EDG Rating.

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

3.0 FOLLOW-UP ACTIONS

ACTIONS

- 3.1 — Ensure EDGs start and energize affected ES 4160V bus.

IF an EDG fails to energize its respective bus,
THEN energize affected bus from any available power source.

DETAILS

- 1 — Ensure all feeder Bkrs to affected bus are open.

Feeder	A BUS	B BUS
BEST	__3205	__3206
Offsite	__3211	__3212
AUX	__3207	__3208
EDG	__3209	__3210

- 2 — IF EDG tripped after energizing the bus,
THEN defeat the "4160V ES BUS ES/UV BLOCK LOCK OUT" for the affected bus:

- o Open knife switch "AY" in the dummy cubicle for the affected ES 4160V Bus.
- o Reset UV lockout by depressing the reset P/B for the affected bus.

- 3 — Close feeder Bkr from the available power source by holding in "CLOSE" position for \approx 10 sec:

FEEDER	A BUS	B BUS
BEST	__3205	__3206
Offsite	__3211	__3212
AUX	__3207	__3208

- 4 — IF knife switch "AY" was opened per detail step 2,
THEN close knife switch "AY".

Table 1: EDG Rating.

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

3.0 FOLLOW-UP ACTIONS

<u>ACTIONS</u>	<u>DETAILS</u>
3.2 — Notify personnel of plant conditions as required.	o — SOTA o — Plant Operators o — SSOD to evaluate plant conditions for potential entry into the Emergency Plan.
3.3 — CONCURRENTLY PERFORM VP-580, Plant Safety Verification Procedure, beginning with Step 1.1.	
3.4 — IF Loss of letdown flow has occurred, THEN restore letdown, OR isolate letdown.	o — Restore letdown flowpath, OR o — Close MUV-49 IF MUV-49 will NOT close, THEN Close: o — MUV-50, Block Orifice Iso AND o — MUV-51, Block Orifice Bypass

Table 1: EDG Rating.

Time	Maximum Load Range in KW
30 min	> 3250 to ≤ 3500
200 hr	> 3000 to ≤ 3250
2000 hr	> 2850 to ≤ 3000
Continuous	≤ 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

- 3.5 — IF the affected Bus has NOT been energized, AND a tripped EDG exists, THEN correct the cause of the trip and energize the affected Bus.

Tripped EDG recovery:

- 1 — Block the EDG start command by selecting the "NORMAL/AT ENGINE" switch to "AT ENGINE" on the tripped EDG's gauge board.
- 2 — Ensure condition causing trip is corrected.
- 3 — Depress the "RESET" P/B on the EDG gauge board.
- 4 — Wait at least 2 minutes to allow the shutdown relays to reset.
- 5 — Select the "NORMAL/AT ENGINE" switch to "NORMAL" on the EDG gauge board.

The EDG should start and energize the bus if an undervoltage condition exists.

- 3.6 — IF ES 480V undervoltage lockout has actuated, THEN reset ES 480V lockout.

1. — Bypass or Reset ES actuation.
2. — Reset ES 480V lockouts located behind the MCB.

ES 480V U/V Lockouts:

A	B
__ 8627/ESA	__ 8627ESB
__ 86X27/ESA	N/A

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS	DETAILS
3.7 — IF either ES 480V Bus is <u>NOT</u> energized, <u>THEN</u> ensure ES MCC-3AB is aligned to energized ES 480V Bus	<ol style="list-style-type: none">1. — Ensure EDG has enough capacity to supply desired loads, if operating, see Tables 1, 2, and 3.2. — Depress transfer pushbuttons for the ES-MCC-3AB to the energized ES 480V Bus.
3.8 — IF MUP restart is required, <u>THEN</u> start MUP, <u>AND</u> establish RCP seal injection.	<ol style="list-style-type: none">1. — Close MUV-16, Seal Injection Control Valve.2. — Close MUV-31 PZR Level Control Valve.3. — Establish MUP cooling.4. — Establish MUP recirc flow path.5. — Start Lube and Gear oil pumps.6. — Start ES selected MUP.7. — Throttle open, MUV-16, to obtain 2 gpm/RCP.8. — Place MUV-31 in AUTO at desired setpoint9. — Throttle open, MUV-16, over a 30 min. period, to establish ≈ 10 gpm/RCP.
3.9 — IF an additional MUP is required to be started, <u>THEN</u> ensure EGDG capacity for 693 KW additional load exists prior to starting.	<ol style="list-style-type: none">o See Table 1 of EDG rating

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
3.10 — <u>IF</u> RCS was on Decay Heat Removal, <u>AND</u> DHP restart is required, <u>THEN</u> verify prerequisite conditions as directed by SSOD.	Refer to OP-404, Decay Heat Removal System, Section 4.5.
3.11 — <u>IF</u> SW Raw Water PRESS has <u>NOT</u> recovered, <u>THEN</u> start RWP-2A or RWP-2B	To start RWP-2B: 1. Select RWP-2B control switch to the "STOP" position to reset the anti-pump device. 2. Select RWP-2B control switch to the "START" position.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.12 — IF all of the following conditions are met:

- o PZR htrs are required,
- o PZR htr normal power supply is NOT available,
- o PZR heater MCC-3A is available,

THEN ensure EDG-1A capacity for 126 KW load
AND energize 1 htr group from 4160V ES Bus 3A.

- o See Table 1 for EDG rating.
- o Perform Enclosure 1 to energize htr group.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.13 — IF all of the following conditions are met:

- o PZR htrs are required,
- o PZR htr normal power supply is NOT available,
- o PZR heater MCC-3A is NOT available,

THEN ensure EDG-1B capacity for 126 KW load
AND energize 1 htr group from 4160V ES Bus 3B.

- o See Table 1 for EDG rating.
- o Perform Enclosure 2 to energize htr group.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

- 3.14 — IF an outside air
compressor is available,
THEN notify TB Operator to
start SAP-1C or SAP-1D.
-

- 3.15 — IF SAP-1C and SAP-1D are
NOT available,
THEN start diesel air
compressor, if available.
-

- 3.16 — IF all outside air
compressors are NOT
available,
THEN energize and
Start IAP-1A
OR
Start IAP-1B.

Refer to Enclosure 1 for IAP-1A

Refer to Enclosure 2 for IAP-1B

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.17 — Start control complex ventilation.

1. — Ensure EDG has enough capacity to supply desired loads, see Tables 1, 2, and 3.
2. — Start normal control complex ventilation. Refer to OP-409, Plant Ventilation, Section 4.2.
3. — Start control complex chiller. Refer to OP-409, Plant Ventilation, Section 4.10.
IF control complex chillers are NOT available,
THEN refer to OP-409, Plant Ventilation, Section 4.3 for Appendix R chillers,
OR refer to MP-193, Temporary Cooling to Control Complex.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.18 IF DPBA-1C battery charge is desired,
AND EDG capacity exists,
THEN charge DPBA-1C from energized 4160V ES Bus

- o Refer to Enclosure 1 for battery charge from 4160V ES A
- o Refer to Enclosure 2 for battery charge from 4160V ES B

3.19 IF EDG capacity exists
AND heat tracing is desired,
THEN RESTORE heat tracing.

1. — Ensure EDG has enough capacity to supply heat tracing loads, if operating, see Tables 1, 2, and 3.
2. — IF heat tracing is desired,
THEN reset heat tracing at:
 - o HTCP-2, "A" heat trace panel near ES MCC-3A2, 119' Aux Bld.
 - o HTCP-5, "B" heat trace panel near Elevator, 95' Aux Bld.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION:

When operating an EDG in parallel with Unit 3 Startup Transformer, avoid unnecessary loading of the transformer in order to prevent voltage fluctuations which could cause tripping of the EDG output bkr and loss of bus voltage.

Note

Plant should be in a stable condition prior to paralleling to EDG.

3.20 — WHEN alternate power is available to ES 4160V busses,
THEN sync in alternate power supply,
AND unload EDG.

1. — Ensure HPI is bypassed or reset.
— Depress the "4160V ES A or B UV RESET" pushbutton.
2. — Select EDG speed droop to 60 in increments of 10.
— Select EDG Unit/Parallel switch to "PARALLEL".
— Select synchroscope for Bkr to be paralleled to "ON".
3. — Select "EXC VOLT ADJ SELECT" switch to "CONT RM".
4. — Match voltages using "EXC VOLT ADJ DIESEL GEN".
— Adjust Gen speed to establish synchroscope moving slowly in the "SLOW" direction, Counter- clockwise.
5. — Close oncoming Bkr at \approx 1 o'clock.
6. — Refer to OP-707, Operation of the ES Emergency Diesel Generators, Section 4.13, for ES restoration.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Table 3: ES 480V Loads and Ratings

LOADS	KW
ES-MCC-3AB With AHF-1C	91
"A" or "B" Heat Tracing	41
EFIC Room Fans	13
AHF-19A or 19B	17
AHF-17A/B or AHF-18A/B	50
Chilled Water Pumps	17
Chiller	193
Spent Fuel Pumps	41

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.21 — GO TO applicable operating
procedures
AND exit this procedure.

DETAILS

Applicable operating procedures to
be determined by plant conditions
and SSOD.

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Enclosure 1

Energizing Pressurizer Heaters, IAP-1A, DPBC-1G and DPBC-1I from
4160V ES A

- 1.0 ☐ Ensure 480V Reactor Aux Bus 3A feeder breakers are open. Ensure open:
- o Bkr 3305
 - o Bkr 3395
-

- 2.0 ☐ Notify TB Operator to ensure open all breakers on:
- ☐ 480V Rx Aux Bus 3A
 - ☐ PZR Htr MCC-3A
-

- 3.0 ☐ Place IAP-1A c/s in Pull-to-Lock.
-

- 4.0 ☐ Energize 480V Rx Aux Bus 3A. Close the following breakers:
- o Bkr 3321
 - o Bkr 3395
-

- 5.0 ☐ Energize PZR Htr MCC-3A Notify TB Operator to close Unit 1C, Bkr 3355, at Rx Aux Bus 3A, PZR Htr MCC-3A feeder.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Enclosure 1 (Cont'd)

Energizing Pressurizer Heaters, IAP-1A, DPBC-1G and DPBC-1I from
4160V ES A

- 6.0 — IF Pressurizer heaters are required,
Energize PZR control power,
THEN Energize 1 group of heaters.
1. — Ensure EGDG-1A capacity is available for 126 KW, see Table 1 for EDG rating.
 2. — Notify TB Operator to close the following Bkrs at PZR Htr MCC-3A:
 - o Unit 1A, PZR Control A-1
 - o Unit 2A, PZR Control A-2
 3. — Notify TB Operator to close 1 of the following Bkrs at PZR Htr MCC 3A:
 - o Unit 1C, PZR Htr Grp 7
 - OR
 - o Unit 2C, PZR Htr Grp 8
 - OR
 - o Unit 3C, PZR Htr Grp 9
-
- 7.0 — IF IAP-1A is required,
Establish IAP-1A cooling from SW system,
THEN start IAP-1A.
1. — Ensure EGDG-1A capacity is available for 75 KW, see Table 1 for EDG rating.
 2. — Notify TB Operator to line up SW cooling for IAP-1A,
 - o Refer to OP-408, Nuclear Services Cooling System, Section 4.6.
 3. — Start IAP-1A.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Enclosure 1 (Cont'd)

Energizing Pressurizer Heaters, IAP-1A, DPBC-1G and DPBC-1I from
4160V ES A

- 8.0 — IF DPBC-1C Battery recharge is required,
Place DPBA-1C on charge.
1. — Ensure EGDG-1A capacity is available for 160 KW, see Table 1 for rating.
 2. — Notify TB Operator to Ensure open DPDP-1C Switch #13
 3. — Notify TB Operator to Close the following Switches:
 - o DPDP-1C Switch #4
 - o DPDP-1C Switch #14
 4. — Notify TB Operator to select DPXS-1C to the "PZR Htr MCC-3A" feed, "UP", position.
 5. — Notify TB Operator to Close PZR Htr MCC-3A Bkrs:
 - o Unit 3A, DPBC-1G supply
 - o Unit 3B, DPXS-1C supply

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Enclosure 2

Energizing Pressurizer Heaters, IAP-1B, DPBC-1H and DPBC-1I from
4160V ES B

1.0 — Ensure the following 480V
feeder and tie breakers are
open.

1. — Ensure open:

- o Bkr 3392, Plant Aux Tie
- o Bkr 3312, Plant Aux Feeder
- o Bkr 3306, Rx Aux 3B Feeder
- o Bkr 3396, Rx Aux 3B Tie
- o Bkr 3393, Turb Aux 3A Tie
- o Bkr 3394, Turb Aux 3B Tie
- o Bkr 3399, Heating Aux Tie

2.0 — Notify TB Operator to
ensure open all breakers
on:

- 480V Plant Aux Bus
- 480V Rx Aux Bus 3B
- PZR Htr MCC-3B

3.0 — Place IAP-1B c/s in Pull-
to-Lock.

4.0 — Energize 480V Plant Aux
Bus.

Close the following breakers:

- o Bkr 3222
- o Bkr 3312

5.0 — Energize 480V Rx Aux Bus
3B.

Close the following breakers:

- o Bkr 3392
- o Bkr 3396

6.0 — Energize PZR Htr MCC-3B.

Notify TB Operator to close Unit
1C, Bkr 3356, at Rx Aux Bus 3B, PZR
Htr MCC-3B feeder.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Enclosure 2 (Cont'd)

Energizing Pressurizer Heaters, IAP-1B, DPBC-1H and DPBC-1I from
4160V ES B

- 7.0 — IF Pressurizer heaters are required,
Energize PZR control power,
THEN Energize 1 group of heaters.
1. — Ensure EGDG-1B capacity is available for 126 KW, see Table 1 for EDG rating.
 2. — Notify TB Operator to close the following Bkrs at PZR Htr MCC-3B:
 - o Unit 1A, PZR Control B-1
 - o Unit 1B, PZR Control B-2
 3. — Notify TB Operator to close 1 of the following Bkrs at PZR Htr MCC-3B:
 - o Unit 2A, PZR Htr Grp 2
 - OR
 - o Unit 3A, PZR Htr Grp 5
 - OR
 - o Unit 4A, PZR Htr Grp 6
 - OR
 - o Unit 1D, PZR Htr Grp 10
 - OR
 - o Unit 2C, PZR Htr Grp 11
 - OR
 - o Unit 3C, PZR Htr Grp 12
 - OR
 - o Unit 4C, PZR Htr Grp 13

-
- 8.0 — IF IAP-1B is required,
Establish IAP-1B cooling from SW system,
THEN start IAP-1B
1. — Ensure EGDG-1B capacity is available for 75 KW, see Table 1 for EDG rating.
 2. — Notify TB Operator to line up SW cooling for IAP-1B,
 - o Refer to OP-408, Nuclear Services Cooling System, Section 4.6.
 3. — Start IAP-1B.

Table 1: EDG Rating

Time	Maximum Load Range in KW
30 min	> 3250 to \leq 3500
200 hr	> 3000 to \leq 3250
2000 hr	> 2850 to \leq 3000
Continuous	\leq 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFP-1	528
SWP-1A or SWP-1B	486
RWP-2A or RWP-2B	538
AHF-1A or AHF-1B or AHF-1C	61

Enclosure 2 (Cont'd)

Energizing Pressurizer Heaters, IAP-1B, DPBC-1H and DPBC-1I from
4160V ES B

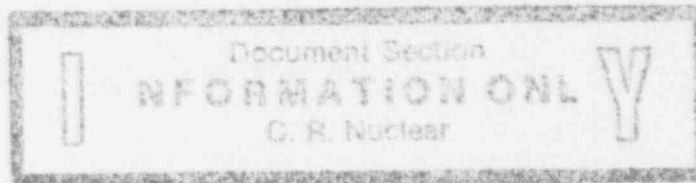
- 9.0 — IF DPBC-1C Battery recharge is required,
Place DPBA-1C on charge.
1. — Ensure EGDG-1B capacity is available for 160 KW, see Table 1 for rating.
 2. — Notify TB Operator to Ensure open DPDP-1C Switch #14
 3. — Notify TB Operator to Close the following Switches:
 - o DPDP-1C Switch #5
 - o DPDP-1C Switch #13
 4. — Notify TB Operator to select DPXS-1C to the "PZR Htr MCC-3B" feed, "DOWN" position.
 5. — Notify TB Operator to Close PZR Htr MCC-3B Bkrs:
 - o Unit 3BL, DPBC-1G supply
 - o Unit 3BR, DPXS-1C supply

SBO	REV 07	DATE 04/17/93	AP-790
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STATION BLACKOUT

1.0 ENTRY CONDITIONS

IF a loss of off-site power occurs during Modes 1 thru 4
AND neither 4160V ES buses can be energized.
THEN use this procedure.



This Procedure Addresses Safety Related Components		
Approved by MNPO	<i>[Signature]</i> Wmm	Date 4-12-23
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2.0 IMMEDIATE ACTIONS

ACTIONS

DETAILS

Note

There are no Immediate Actions in this procedure.

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3.0 FOLLOW-UP ACTIONS

<u>ACTIONS</u>	<u>DETAILS</u>
3.1 — Minimize RCS inventory loss.	<ul style="list-style-type: none">o Close MUV-49. Valve position indication is available at the ES-B panel.o Close MUV-253o Contact Chemistry and ensure all sampling of the primary system is stopped.
3.2 — Ensure core cooling.	<ul style="list-style-type: none">o EFP-2 startedo EFIC OTSG level control is selected to 65%o EFW flow exists to both OTSGs.
<hr/> <u>Note</u> <hr/>	
Neutron flux recorders will not be operable. Use edgewise meters for monitoring neutron flux levels. <hr/>	
3.3 — Verify the reactor is shutdown.	<ul style="list-style-type: none">o IR flux decreasing.o SR flux decreasing.o SR flux at shutdown level and not increasing.
3.4 — Secure DC motors at the Main Control Board that are not needed by placing their control switches in Pull-to-lock.	<ul style="list-style-type: none">— MUP-3A, MUP A B/U LUBE OIL PP— MUP-3B, MUP B B/U LUBE OIL PP— MUP-3C, MUP C B/U LUBE OIL PP— RCP-3A, RCP A DC OIL LIFT PP— RCP-3B, RCP B DC OIL LIFT PP— RCP-3C, RCP C DC OIL LIFT PP— RCP-3D, RCP D DC OIL LIFT PP

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3.0 FOLLOW-UP ACTIONS (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
3.5 — Actuate MS line isolation on both OTSGs.	<ul style="list-style-type: none">o Depress "SG MAIN STM ISOLATION" pushbuttons.o Verify all 4 MSIVs closed by observing status lights on PSA panel.
<hr/> <div data-bbox="781 629 850 661"><u>Note</u></div> <div data-bbox="264 693 1360 757">In-plant communications should be made with the hand-held radios, on Channel 11 during the performance of this procedure.</div> <hr/>	
3.6 — Notify personnel of plant conditions as required.	<ul style="list-style-type: none">— SOTA,— Plant Operators,— SSOD to evaluate plant conditions for potential entry into the Emergency Plan.
3.7 — Notify available operator to observe EFP-2.	Locally observe EFP-2 performance and report indications of abnormal pump/turbine operation.
3.8 — Continue attempts to restore AC power to the 4160 ES buses.	<ul style="list-style-type: none">o Attempt to restore EDG operation.o Determine status of 230KV Switchyard<ul style="list-style-type: none">o Off-Site Power Source Xfmro Backup ES Transformero Determine status of 500KV switchyard to establish backfeed.

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3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.9 — IF a tripped EDG exists,
THEN correct the cause of
the trip and energize the
affected Bus.

DETAILS

Tripped EDG recovery:

- 1 — Block the EDG start command
by selecting the "NORMAL/AT
ENGINE" switch to "AT
ENGINE" on the tripped
EDG's gauge board.
- 2 — Ensure condition causing
trip is corrected.
- 3 — Depress the "RESET" P/B on
the EDG gauge board.
- 4 — Wait at least 2 minutes to
allow the shutdown relays
to reset.
- 5 — Select the "NORMAL/AT
ENGINE" switch to "NORMAL"
on the EDG gauge board.

The EDG should start and energize
the bus if an undervoltage condition
exists.

-
- 3.10 — IF, at any time while
performing this procedure,
4160V ES bus power is
available,
THEN GO TO Step 3.24 in this
procedure.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.10 IF 4160V ES bus power is available,
THEN GO TO Step 3.24 in this procedure.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.11 — IF, at any time while performing this procedure, adequate subcooling margin does NOT exist, THEN:

- o Raise OTSG levels to 95% using EFW.
- o Immediately begin a cooldown at the maximum achievable rate.

- o See Table 1 for adequate subcooling margins.
- o Depress "95%" level select pushbutton on both OTSGs.
- o Open MSV-25 and MSV-26 fully.
- o There are no applicable cooldown rate limits for this cooldown.

NOTE

The PORV and the High Point Vents should remain closed during performance of this procedure unless specifically directed otherwise.

3.12 — Select PORV, RCV-10, to CLOSE.

ICS panel control switch.

3.13 — IF, at any time while performing this procedure, RCS PRESS increases to ≈ 2400 psig. THEN manually operate the PORV to reduce RCS PRESS based on subcooling.

IF the PORV is NOT available, THEN allow RCS PRESS to increase to the PZR Safety Valve setpoint of 2500 psig.

o IF adequate subcooling margin does NOT exist, THEN reduce RCS PRESS until $T_{\text{incore}} \approx 50^{\circ}\text{F} > T_{\text{sat}}$ of the OTSG.

o IF adequate subcooling margin exists, THEN reduce RCS PRESS until:

- o RCS PRESS ≈ 100 psig above the adequate subcooling margin curve

OR

- o RCS PRESS ≈ 1600 psig

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.10 IF 4160V ES bus power is available,
THEN GO TO Step 3.24 in this procedure.

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.14 — Vent main generator H² pressure to \approx 0 psig.
Venting will take \approx 20 minutes to complete.
Continue on in this procedure.

DETAILS

Notify available operator to perform the following:

1 Close H² isolation valves:

- HYV-28
- GGV-213
- GGV-220

2 — Open H² vent valves:

- o GGV-232
- o GGV-274

Valves are located on 95' TB at H² manifold area.

-
- 3.15 — Control EFW flow to maintain RCS TEMP and minimize PZR outsurge.
-

- 3.16 — Provide cooling to the electrical equipment in the Control Complex

Ensure the following doors are open and remain open until Control Complex ventilation is restored.

- o All Annunciator cabinet doors
- o All ICS cabinet doors
- o All NNI cabinet doors
- o All EFIC cabinet doors
- o All doors on the 145 ft. elevation leading from the Control Room to the Turbine Building.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.10 IF 4160V ES bus power is available,
THEN GO TO Step 3.24 in this procedure.

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.0 FOLLOW-UP ACTIONS (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
3.17 — IF, at any time, while performing this procedure, OTSG PRESS decreases to ≤ 100 psig AND Units 1/2 steam is available, THEN supply EFP-2 from Units 1/2 steam.	Perform Enclosure 1 to supply EFP-2 from Units 1/2 steam.
3.18 — IF instrument air is not available. THEN align N ₂ to the ADVs	o Close N ₂ vent valve NGV-324. o Open N ₂ supply valve NGV-312.
3.19 — Control OTSG PRESS to prevent cooldown of the RCS.	
<u>Note</u>	
FWP-5A and FWP-5B should be operated for 30 minutes following event initiation.	
3.20 — IF power restoration has not occurred, THEN stop FWP lube oil pumps.	1 — Place FWP-5A in Pull-to-lock. 2 — Place FWP-5B in Pull-to-lock.
3.21 — De-energize plant computer Inverter VBIT-1E.	1 — Open Inverter "AC Input" Bkr. 2 — Open Inverter "AC Output" Bkr. 3 — Open Inverter "Battery Input" Bkr.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.10 IF 4160V ES bus power is available,
THEN GO TO Step 3.24 in this procedure.

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.22 — WHEN main generator pressure has decreased to ≈ 0 psig,
THEN purge the generator using N^2 for 1.5 hours,
OR until a total of 20" N^2 has been used.

Continue on in this procedure.

DETAILS

- o Use local H^2 pressure indication, TB-156-PI, 95' TB.

Notify available operator to perform the following:

- 1 — Open generator purge valves, 95' TB by H^2 header:

- o GGV-233
- o GGV-234

- 2 — Open N^2 purge supply valves, 119' TB West of Cardox tank:

- o NGV-325
- o NGV-326

- 3 — Ensure open, both N^2 tank outlet valves:

- o NGV-260
- o NGV-261

- 4 Record data:

North N^2 tank level _____ inches
South N^2 tank level _____ inches
Time of purge start _____ hours

- 5 WHEN either 1.5 hours has elapsed
OR a total of 20" N^2 has been used,
THEN isolate the purge lineup by closing:

- NGV-325
- NGV-326
- GGV-233
- GGV-234
- GGV-232

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.10 IF 4160V ES bus power is available,
THEN GO TO Step 3.24 in this procedure.

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS	DETAILS
3.23 — <u>WHEN</u> main generator has been purged with N ₂ , <u>THEN</u> stop TBP-3 and TBP-10 <u>AND</u> open DPDP switches for these pumps. Continue on in this procedure.	1 — Place TBP-3 control switch in Pull-to-lock. 2 — Open DPDP 1C, switches 2 and 16. 3 — Open DPDP 3B, switches 17 and 13.

3.24 — Place EFP-1 control switch in Pull-to-lock.	Provides for controlled start-up following power restoration.
--	---

Note

Opening HPI pump Bkrs provides for controlled start-up following power restoration.

3.25 — <u>IF</u> an ES actuation has occurred prior to energizing the 4160V ES buses. <u>THEN</u> ensure ES is bypassed or reset <u>AND</u> ensure HPI pump Bkrs are open	1 — Ensure ES is bypassed or reset — HPI bypassed or reset — LPI bypassed or reset — RBIC bypassed or reset 2 — Position the following control switches to "STOP" then "NORM-AFT-STOP" — MUP-1A — MUP-1B — MUP-1C
---	--

3.26 — <u>WHEN</u> ES 4160V power is available, <u>THEN</u> continue this procedure.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

If the A ES 4160V ES/UV Undervoltage Lockout has actuated, it will be necessary to defeat this lockout by opening Switch AY, located in ES 4160V Bus A Cubicle 3A13, Dummy Bkr, and reset the Undervoltage Lockout.

3.27 — Restore power to ES 4160V
A Bus.

1 — Ensure switchgear room is
cleared prior to energizing the
bus.

2 — Close one of the following
feeders by selecting CLOSE
position for ≈ 10 seconds:

o 3211, Unit 3 Offsite Power
Transformer,

OR

o 3205, Unit 3 Backup ES
Transformer,

OR

o 3209, If EDG-1A is operating
at rated voltage and speed.

3 — IF Switch AY in Cubicle
3A13, Dummy Bkr, is open,
THEN close the switch.

4 — IF EDG is supplying the bus,
THEN CONCURRENTLY PERFORM
AP-770, Emergency Diesel
Generator Actuation, beginning
with Step 3.8.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

If the B ES 4160V ES/UV Undervoltage Lockout has actuated, it will be necessary to defeat this lockout by opening Switch AY, located in ES 4160V Bus B Cubicle 3B2, Dummy Bkr, and reset the Undervoltage Lockout.

3.28 — Restore power to ES 4160V
B Bus.

1 — Ensure switchgear room is
cleared prior to energizing the
bus.

2 — Close one of the following
feeders by selecting CLOSE
position for ≈ 10 seconds:

o 3212, Unit 3 Offsite Power
Transformer,

OR

o 3206, Unit 3 Backup ES
Transformer,

OR

o 3210, If EDG-1B is operating
at rated voltage and speed.

3 — IF Switch AY in Cubicle 3B2,
Dummy Bkr, is open,
THEN close the switch.

4 — IF EDG is supplying the bus,
THEN CONCURRENTLY PERFORM-
AP-770, Emergency Diesel
Generator Actuation, beginning
with Step 3.8.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.29 ____ IF any ES 480V bus is de-energized, THEN energize the de-energized bus or busses.

o ES 480V Bus 3A:

1 IF UV lockout relays are tripped, THEN reset the lockout relays located behind the MCB.

1 ____ 8627/ESA
2 ____ 86X27/ESA

2 ____ Close Bkr 3221.

3 ____ Close Bkr 3311.

o ES 480V Bus 3B:

1 ____ IF UV lockout relay is tripped, THEN reset the lockout relay located behind the MCB.

o ____ 8627/ESB

2 ____ Close Bkr 3220.

3 ____ Close Bkr 3310.

3.30 ____ Ensure all ES 480V MCCs are energized.

____ ES MCC 3A1
____ ES MCC 3A2
____ ES MCC 3A3
____ ES MCC 3B1
____ ES MCC 3B2
____ ES MCC 3B3
____ ES MCC 3AB

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.31 — Ensure SW and RW cooling
water systems are operating.

- o — SWP-1A or SWP-1B
 - o — RWP-2A or RWP-2B
-

3.32 — IF EFW is required,
THEN start EFP-1
AND CONCURRENTLY PERFORM
AP-450, Emergency Feedwater
Actuation, beginning with
Step 3.9.

- o — Start EFP-1 from the Main
Control Room.
-

3.33 — IF EFP-2 is NOT required,
THEN stop EFP-2.

Close ASV-5 and ASV-204.

3.34 — IF adequate subcooling
margin exists,
THEN GO TO Step 3.37 in
this procedure.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.35 — Establish HPI flow.

- 1 — Ensure MUV-16, Seal Injection Control Valve is closed.
- 2 — Verify "SWGR TRANSF PERMIT" light is lit.
- 3 — Ensure MUP control switch is selected to NORM-AFT-STOP.
- 4 — Ensure BWST suction is open.
 - o MUV-73 o MUV-58
- 5 — Ensure MUP recirc valves are open:
 - o MUV-53 o MUV-257
- 6 — Ensure Main Lube Oil Pump is operating.
- 7 — Ensure Main Gear Oil Pump is operating.
- 8 — Start MUP.
- 9 — Establish HPI using all 4 injection lines.

3.36 — GO TO 1 of the following procedures based on T_{incore}

T_{incore}	Procedure
< Adequate Subcooling Margin	AP-380, ESA beginning with Step 3.5
Superheated	EP-290, ICC beginning with Step 3.1

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

- 3.37 — IF adequate subcooling margin exists,
THEN CONCURRENTLY PERFORM AP-530, Natural Circulation, beginning with Step 3.4.

See Table 1 for adequate sub-cooling margins.

CAUTION

Ensure cooling water is supplied to MUP prior to starting.

- 3.38 — IF MUP is required
THEN start 1 MUP
AND establish RCP Seal Injection and Make-up.

- 1 — Ensure closed MUV-16, Seal Injection Control Valve.
- 2 — Ensure closed MUV-31, PZR Level Control Valve.
- 3 — Verify "SWGR TRANSF PERMIT" light is lit for desired MUP to be started.
- 4 — Ensure MUP Main Lube Oil Pump running.
- 5 — Start MUP Main Gear Oil Pump.
- 6 — Ensure respective suction valves are opened.
- 7 — Ensure recirc flow path exists.
- 8 — Start desired MUP.
- 9 — Ensure open MUV-18, Seal Injection Block Valve.
- 10 — Throttle open MUV-16 to obtain 2 gpm/RCP.
- 11 — Ensure open MUV-253, RCPs Controlled Bleed-off MOV.
- 12 — Throttle open MUV-16 over a 30 min period to establish \approx 10 gpm/RCP.
- 13 — Operate MUV-31 to obtain desired PZR level.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS	DETAILS
3.39 IF RCS make-up is established, AND RCS letdown is desired, THEN restore RCS letdown.	<ol style="list-style-type: none">1 Ensure the following valves are closed:<ol style="list-style-type: none">o MUV-49o MUV-50o MUV-512 Place desired letdown coolers in service:<ol style="list-style-type: none">1 Ensure SW cooling2 Ensure MU inlet and outlet valves are open3 Restore letdown flow:<ol style="list-style-type: none">1 Open MUV-492 Throttle Open MUV-51 to establish \approx 2.5 gpm each minute for 20 minutes3 Allow letdown temperature to stabilize for \approx 10 minutes4 Open MUV-505 Throttle MUV-51 to establish desired letdown flow.
3.40 Energize plant computer Invertor VBIT-1E.	<ol style="list-style-type: none">1 Close Invertor "Battery Input" Bkr.2 Close Invertor "AC Output" Bkr.3 Close Invertor "AC Input" Bkr.4 Verify normal Invertor AC output voltage of approximately 120V.

Table 1: Tsat Monitor Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

3.11 IF adequate subcooling margin does NOT exist,
THEN raise OTSG levels to 95% with EFW.
AND begin a cooldown at maximum rate.

3.13 IF RCS PRESS increases to ≈ 2400 psig,
THEN manually open the PORV to reduce RCS PRESS based on subcooling.

3.17 IF OTSG PRESS decreases to ≤ 100 psig
AND Units 1/2 steam is available,
THEN supply EFP-2 from Units 1/2 steam.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.41 — Determine the operability
of balance of plant
equipment and restore plant
systems as required.

GO TO appropriate OPs for plant
systems operational guidance.

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Enclosure 1

Supplying EFP-2 From Units 1/2 Steam

1. — Perform valve alignment
for ASDT 1 & 2.

- o ASDT-1 valve alignment:

— Open ASV-93, Root Isol.
— Open ASV-118, Inlet.
— Close ASV-117, Outlet.
— Fully open ASV-109 and
blowdown through orificed
cap as required.
— Close ASV-101, Bypass.

- o ASDT-2 valve alignment:

— Open ASV-94, Root Isol.
— Open ASV-120, Inlet.
— Close ASV-119, Outlet.
— Fully open ASV-110 and
blowdown through orificed
cap as required.
— Close ASV-102, Bypass.

-
2. — IF steam line up to ASV-18
is NOT warmed,
THEN notify Unit 1/2
Control Room to start
warmup & pressurization
of steam line up to
ASV-18.

Ensure Auxiliary Steam Tie-line
is drained of condensate prior
to opening ASV-18.

-
3. — Perform warmup & pressurization
between ASV-18 and ASV-16

- 1 — Close the following ASV
isolation valves:

— ASV-15
— ASV-183
— ASV-16

- 2 — Throttle open ASV-18 one turn
off closed seat.

- 3 — Ensure condensate removal via
ASDT-1.

- 4 — WHEN steam PRESS is equalized
around ASV-18,
THEN open ASV-18.

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Enclosure 1 (CONT'D)

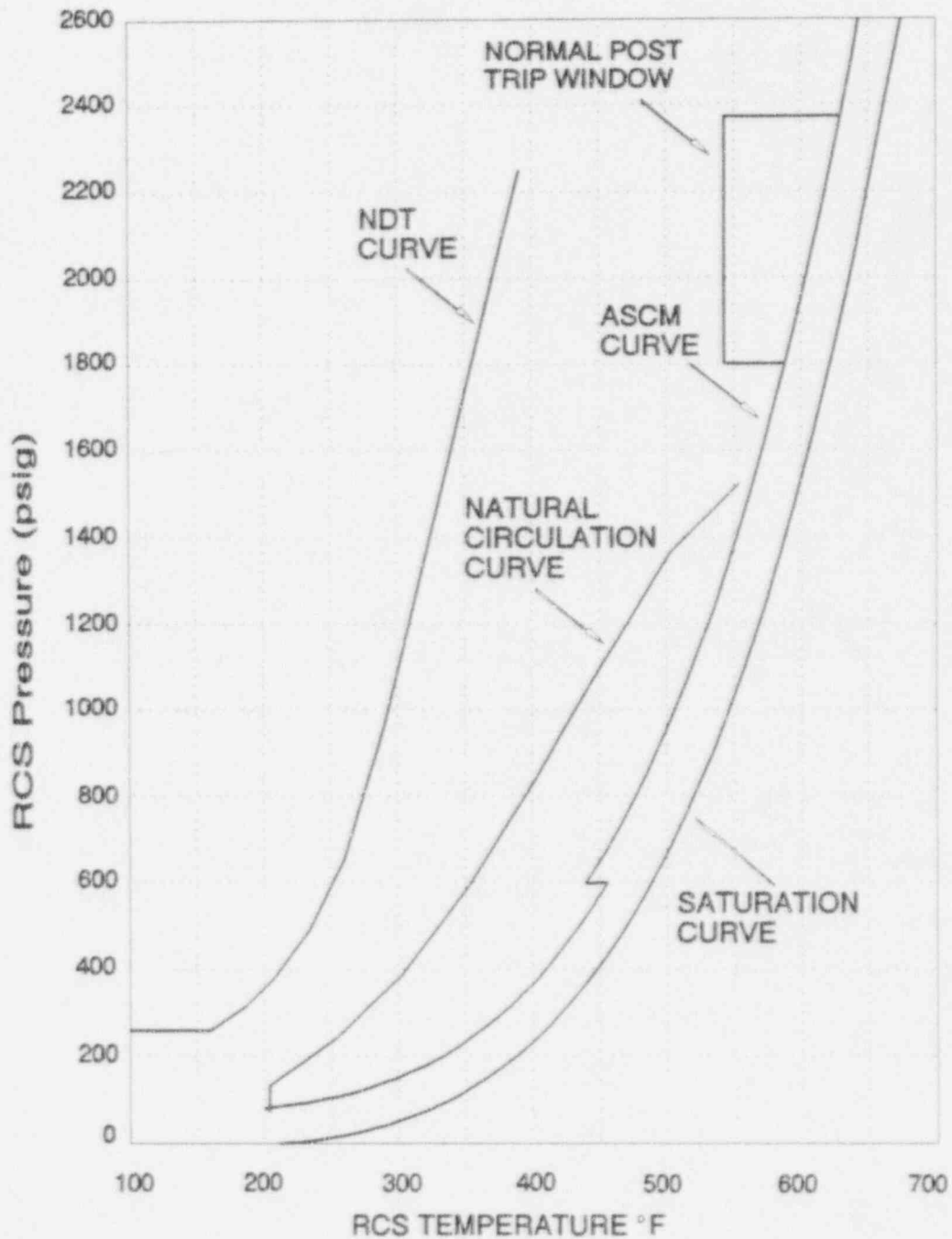
Supplying EFP-2 From Units 1/2 Steam

4. ☐ Perform warmup & pressurization
of Auxiliary Steam
Line to EFP-2.
 - 1 ☐ Ensure closed ASV-33.
 - 2 ☐ Open ASV-23.
 - 3 ☐ Throttle open ASV-15 one
turn off closed seat.
 - 4 ☐ WHEN steam PRESS is
equalized around ASV-15,
THEN open ASV-15.

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Enclosure 2

Cooldown Curve for Natural Circulation and Forced Flow



Acceptable region is:

- o below and to the right of the NDT curve
- o above and to the left of the ASCM curve
- o above and to the left of the Natural Circulation curve if RCPs are off and cooldown rate $\geq 10^{\circ}\text{F/hr}$