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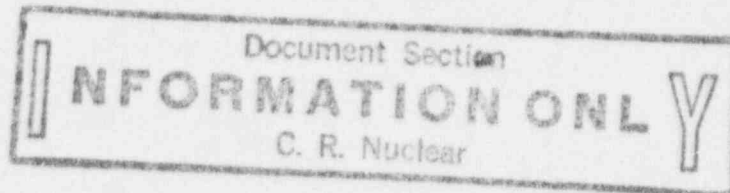
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EMERGENCY DIESEL GENERATOR ACTUATION

1.0 ENTRY CONDITIONS

IF ES 4160V Bus UV occurs,
THEN use this procedure.

2.0 IMMEDIATE ACTIONSNote

There are no immediate actions for this procedure.

This Procedure Addresses Safety Related Components

Approved by MNPO


(SIGNATURE ON FILE)

Date

11/1/96

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3.0 FOLLOW-UP ACTIONS

ACTIONS

DETAILS

3.1 — Notify personnel of plant conditions as required.

- o — STA
- o — Plant operators
- o — SSOD to evaluate plant conditions for potential entry into the Emergency Plan

3.2 — IF both ES 4160V buses are energized,
THEN GO TO Step 3.7 in this procedure.

3.3 — IF at any time while performing this procedure, an EDG fails to energize its respective bus,
THEN check the bus overcurrent lockouts before attempting to re-energize.

- 1 Check overcurrent lockouts on the SSR section of the MCB for the affected bus.

ES 4160V Overcurrent Lockouts:

ES Bus 3A	ES Bus 3B
___86B-3205	___86B-3206
___86B-3207	___86B-3208
___86B-3211	___86B-3212

- 2 — IF no overcurrent lockouts are actuated,
THEN efforts should be made to energize the bus.
- 3 — IF any overcurrent lockout is found actuated,
THEN do not attempt to energize the bus until the fault has been determined and corrected.

Applicable Carry-over steps:

3.3 IF at any time, an EDG fails...

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Do not attempt to energize a bus that has actuated overcurrent lockouts.

3.4 — IF an EDG is running at reduced voltage, AND fails to make up the "READY" matrix, THEN raise EDG voltage.

1 Ensure all feeder Bkrs to affected bus are open.

ES 4160V Bus Feeder Bkrs:

Feeder	A Bus	B Bus
BEST	___3205	___3206
Offsite	___3211	___3212
Aux	___3207	___3208
EDG	___3209	___3210

2 — Select MUPs on the dead bus to Normal After Stop.

3 — IF ES A 4160V Bus is dead, THEN place EFP-1 in Pull To Lock.

4 Attempt to automatically close EDG Bkr:

— Select affected EDG exciter voltage adjust selector switch to "CONT RM".

— Ensure EDG voltage is 4150 to 4250 volts.

5 — IF EFP-1 is required, THEN ensure EFP-1 is running.

6 — IF both ES 4160V Buses are energized, THEN GO TO Step 3.7 in this procedure.

Applicable Carry-over steps:

3.3 <u>IF</u> at any time, an EDG fails...
--

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Do not attempt to energize a bus that has actuated overcurrent lockouts.

3.5 ____ IF an EDG fails to energize its respective bus, AND any of the following power sources are energized:

____ BEST

____ Offsite Power Transformer

____ Aux Transformer

THEN prepare the dead bus for re-energization.

1 Ensure all feeder Bkrs to affected bus are open.

ES 4160V Bus Feeder Bkrs:

Feeder	A Bus	B Bus
BEST	____3205	____3206
Offsite	____3211	____3212
Aux	____3207	____3208
EDG	____3209	____3210

2 ____ Select MUPs on the dead bus to Normal After Stop.

3 ____ IF the "4160V ES BUS ES/UV BLOCK LOCK OUT" has actuated, THEN defeat it for the affected bus:

1 ____ Notify available PPO to open knife switch "AY" in the "DUMMY" cubicle for the affected ES 4160V Bus.

2 ____ WHEN knife switch "AY" is open, THEN reset UV lockout by depressing "4160 ES UV RESET" pushbutton for the affected bus.

Applicable Carry-over steps:

3.3 <u>IF</u> at any time, an EDG fails...
--

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Do not attempt to energize a bus that has actuated overcurrent lockouts.

3.6 — IF all the following conditions exist:

- An EDG fails to energize its respective bus
- Power is available to re-energize the bus
- The bus has been prepared for re-energization

THEN energize the bus from the available power source.

1 — IF opened in step 3.5, THEN notify available PPO to close knife switch "AY" in the "DUMMY" cubicle for the affected ES 4160V Bus.

2 Close feeder Bkr from the available power source by holding in "CLOSE" position until the "4 KV ES BUS DEAD" annunciator alarm clears (normally ≤ 10 seconds).

ES 4160V Bus Feeder Bkrs:

Feeder	A Bus	B Bus
BEST	___3205	___3206
Offsite	___3211	___3212
Aux	___3207	___3208

Applicable Carry-over steps:

3.3 IF at any time, an EDG fails...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.7 — IF at any time while performing this procedure, EDG load rating limits are challenged, THEN perform EDG load management.

DETAILS

- 1 — Stop non-essential equipment to reduce EDG load.
 - o See Table 1, EDG Rating
 - o Refer to Enclosure 1, EDG Loads
- 2 — IF all the following conditions exist:
 - ES B 4160V Bus is de-energized.
 - EFP-2 flow indication is NOT available.
 - EFP-2 is available to cross connect to EFV-57 and EFV-58
 - Equipment must be started which will cause EGDG-1A to exceed 3422 KW while the equipment is starting, OR 3172 KW after equipment is running.

THEN CONCURRENTLY PERFORM Enclosure 2, EFP-2 Cross Connect to EFV-57 and EFV-58

Applicable Carry-over steps:

3.3 IF at any time, an EDG fails...

3.7 IF at any time, EDG-1A load management is required...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.8 — IF letdown flow has been
lost,
THEN isolate letdown.

DETAILS

1 — Close MUV-49 "LETDN CLR ISO".

— IF MUV-49 will NOT close,
THEN close:

— MUV-50 "BLK ORIFICE ISO"

— MUV-51 "LETDOWN FLOW"
control

3.9 — IF at any time while
performing this procedure,
letdown flow restoration
is desired,
THEN CONCURRENTLY PERFORM
EOP-14 Enclosure 4, RC
Letdown Recovery.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG-1A load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Do not attempt to energize a bus that has actuated overcurrent lockouts.

3.10 — IF at any time while performing this procedure, a faulted bus is repaired, THEN make preparations to re-energize the affected bus.

1 — Reset overcurrent lockouts for the affected bus, located on the SSR section of MCB,

ES 4160V Overcurrent Lockouts:

ES Bus 3A	ES Bus 3B
___86B-3205	___86B-3206
___85B-3207	___86B-3208
___86B-3211	___86B-3212

- o — IF the affected bus will be energized from offsite power, THEN GO TO Step 3.5 of this procedure.
- o — IF the affected bus will be energized from the EDG, THEN GO TO Step 3.11 of this procedure.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Do not attempt to energize a bus that has actuated overcurrent lockouts.

3.11 — IF the affected bus is NOT
energized,
AND any of the following
EDG failures have
occurred:

- o An EDG failed to start
- o An EDG tripped after
starting

THEN CONCURRENTLY PERFORM
Enclosure 3, Failed EDG
Recovery.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.12 ____ IF ES 480V UV lockouts have actuated, THEN reset ES 480V lockouts.

DETAILS

1 ____ Bypass or reset any standing ES actuation.

2 Reset ES 480V lockouts located behind the MCB.

ES 480V UV Lockouts:

A	B
____8627/ESA	____8627/ESB
____86X27/ESA	

3.13 ____ IF only 1 ES 480V bus is energized, THEN ensure ES MCC 3AB is aligned to the energized ES 480V bus.

1 ____ Ensure EDG capacity to supply 42 KW additional running load.

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

2 ____ Depress transfer pushbutton for ES MCC 3AB to the energized ES 480V bus.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.14 — IF MUP restart is required,
THEN ensure EDG capacity for 705 KW additional running load and 2085 KW starting load exists prior to starting,
AND start MUP.

Continue in this procedure.

DETAILS

- 1 — Close MUV-16 "RC PUMP TOTAL SEAL INLET FLOW VALVE".
- 2 — Close MUV-31 "PZR LEVEL CONTROL".
- 3 — Establish MUP cooling water supply.
- 4 — Ensure MUP recirc valves are open.
- 5 — Ensure MUP Main Lube Oil pump is running.
- 6 — Ensure MUP Main Gear Oil pump is running.
- 7 — Start ES selected MUP.
- 8 — Throttle open MUV-16 to obtain 3 gpm seal injection per RCP over 2 minutes.
- 9 — Note the time that RCP seal injection was established at 3 gpm: _____
- 10 — Maintain PZR level using MUV-31
- 11 — ≥ 10 min after the time noted in detail 9, throttle open MUV-16 to establish 6 gpm per RCP.
Note the time: _____
- 12 — ≥ 10 min after the time noted in detail 11, throttle open MUV-16 to establish 10 gpm per RCP.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.15 — IF an additional MUP is required to be started, THEN ensure EDG capacity for 705 KW additional running load and 2085 KW starting load exists prior to starting.

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

Note

The KW load value provided is for 1 train of decay heat removal including the DCP and RWP.

3.16 — IF RCS was on decay heat removal, AND decay heat removal restart is required, THEN verify prerequisite conditions, AND restart decay heat removal.

1 — Ensure EDG capacity for 560 KW additional running load and 920 KW starting load exists prior to starting.

o See Table 1, EDG Rating and Enclosure 2, EDG Loads.

2 — Refer to OP-404, Decay Heat Removal System, Section 4.7, Restarting Decay Heat Removal After Pump Trip.

3.17 — IF SW Raw Water PRESS has NOT recovered, THEN start RWP-2A or RWP-2B

o To restart a pump that was running when power was interrupted:

1 — Ensure EDG capacity for 550 KW additional running load and 1540 KW starting load exists prior to starting.

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

2 — Select the control switch to the "STOP" position to reset the anti-pump device.

3 — Select the control switch to the "START" position.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
3.7 IF at any time, EDG load management is required...
3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.18 — IF SW PRESS has NOT
recovered,
THEN start SWP-1A or
SWP-1B

DETAILS

o To restart a pump that was running
when power was interrupted:

1 — Ensure EDG capacity for 515
KW additional running load
and 1575 KW starting load
exists prior to starting.

o See Table 1, EDG Rating
and Enclosure 1, EDG
Loads.

2 — Select the control switch to
the "STOP" position to reset
the anti-pump device.

3 — Select the control switch to
the "START" position.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Only 2 RB cooling units may be operated for emergency cooling. This is to ensure adequate SW flow to other cooled components.

- 3.19 ____ Ensure emergency RB cooling.
- 1 ____ SWP-1A or SWP-1B running.
 - 2 ____ RWP-2A or RWP-2B running.
 - 3 ES selected RB cooling units operating in slow speed:
 - ____ AHF-1A
 - ____ AHF-1B
 - ____ AHF-1C
 - 4 Close CI from RB cooling units:
 - ____ SWV-152
 - ____ SWV-151
 - ____ SWV-355
 - 5 Oper SW to RB cooling units:
 - ____ SWV-353
 - ____ SWV-354
 - 6 ____ SW flow is isolated to shutdown RB cooling unit.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to FOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

2 PZR Htr groups are required to compensate for heat loss to ambient.

3.20 IF all of the following conditions are met:

- ___ PZR Htrs are required
- ___ PZR Htr normal power supply is not available
- ___ ES A 4160V Bus is energized
- ___ ES A 480V Bus is energized
- ___ PZR Htr MCC 3A is available

THEN ensure EDG-1A capacity for 275 KW load,
AND energize 2 PZR Htr groups from ES A 4160V Bus

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

o ___ CONCURRENTLY PERFORM Enclosure 4, Energizing PZR Htrs, IAP-1A, DPBC-1G and DPBC-1I from ES A 4160V Bus, to energize 2 PZR Htr groups.

3.21 IF all of the conditions are met:

- ___ PZR Htrs are required
- ___ PZR Htr normal power supply is not available
- ___ ES B 4160V Bus is energized
- ___ ES B 480V Bus is energized
- ___ PZR Htr MCC 3A is not available

THEN ensure EDG-1B capacity for 275 KW load,
AND energize 2 PZR Htr groups from ES B 4160V Bus

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

o ___ CONCURRENTLY PERFORM Enclosure 5, Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus, to energize 2 PZR Htr groups.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.22 — IF an outside air compressor is available, THEN notify SPO to start SAP-1C or SAP-1D

3.23 — IF SAP-1C and SAP-1D are NOT available, THEN notify SPO to start diesel air compressor if available.

3.24 — IF no outside air compressors are available, AND EDG capacity for 85 KW additional load exists, THEN energize and start IAP-1A or IAP-1B

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

o — CONCURRENTLY PERFORM Enclosure 4, Energizing PZR Htrs, IAP-1A, DPBC-1G and DPBC-1I from ES A 4160V Bus, to place IAP-1A in service.

o — CONCURRENTLY PERFORM Enclosure 5, Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus, to place IAP-1B in service.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.25 ____ Start CC ventilation.

1 ____ Ensure EDG capacity exists prior to starting the following loads.

o See Table 1, EDG Rating and Enclosure 1, EDG Loads.

2 ____ IF adequate SCM does NOT exist, THEN start emergency CC recirc as directed by EOP-3

3 ____ IF an ES actuation has occurred, AND adequate SCM exists, THEN start emergency CC recirc.

o Refer to OP-409, Plant Ventilation, Section 4.9

4 ____ IF an ES actuation has NOT occurred, AND adequate SCM exists, THEN start normal CC ventilation.

o Refer to OP-409, Plant Ventilation, Section 4.2

5 ____ Start CC chiller.

o Refer to OP-409, Plant Ventilation, Section 4.10

____ IF CC 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.

6 ____ Start AHF-54A or AHF-54B

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.26 — IF DPBA-1C battery charge is desired,
AND EDG capacity for 175 KW additional running load exists,
THEN energize and charge DPBA-1C battery.

- o See Table 1, EDG Rating and Enclosure 1, EDG Loads.
- o — CONCURRENTLY PERFORM Enclosure 4, Energizing PZR Htrs, IAP-1A, DPBC-1G and DPBC-1I from ES A 4160V Bus, to charge DPBA-1C from ES A 4160V Bus
- o — CONCURRENTLY PERFORM Enclosure 5, Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus, to charge DPBA-1C from ES B 4160V Bus

3.27 — IF heat tracing is desired,
AND EDG capacity for 50 KW additional running load exists,
THEN restore heat tracing.

- o See Table 1, EDG Rating and Enclosure 1, EDG Loads.
- o Reset heat tracing at:
 - HTCP-5, A heat trace panel near ES MCC-3A2, 119 ft AB
 - HTCP-2, B heat trace panel near elevator, 95 ft AB

3.28 — IF offsite power from the 230 KV switchyard cannot be restored in a timely manner,
AND the 500 KV switchyard is available,
THEN establish backfeed to the Aux transformer.

- o Refer to OP-703A, Establishing And Removing 500 KV Electrical Power Backfeed.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.29 — IF offsite power will NOT be available for restoration within 2 hours, THEN verify EDG loading is within fuel oil consumption limits and fuel oil reserves are adequate.

- o — IF both EDGs are running, THEN notify the SSOD to order diesel fuel oil for emergency delivery within 12 hours from the time the EDGs started.
- o — IF both EDGs are running and fuel oil will NOT be delivered within 12 hours, THEN contact TSC for guidance.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

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

3.30 — WHEN offsite power is available to ES 4160V buses, THEN prepare EDG and affected bus for restoration of offsite power.

- 1 — Ensure HPI is bypassed or reset.
- 2 — Depress the "4160V ES A or B UV RESET" pushbutton.
- 3 — Ensure lockouts for affected bus have been reset.

ES 4160V Overcurrent Lockouts:

ES Bus 3A	ES Bus 3B
___86B-3205	___86B-3206
___86B-3207	___86B-3208
___86B-3211	___86B-3212

- 4 — Notify PPO to select EDG "SPEED DROOP" to 60 in increments of 10
- 5 — Select exciter voltage adjust selector switch to "CONT RM".
- 6 — Notify PPO to select EDG Unit Parallel switch to "PARALLEL".
- 7 — Maintain EDG voltage 4150 to 4250 volts using the exciter voltage adjust.

Applicable Carry-over steps:

- 3.3 IF at any time, an EDG fails...
- 3.7 IF at any time, EDG load management is required...
- 3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...
- 3.10 IF at any time, a faulted bus is repaired...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

When operating an EDG in parallel with the Aux Transformer, avoid starting or stopping major loads fed from 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.

3.31 — WHEN preparations are complete for supplying affected bus from offsite power,
THEN sync in offsite power supply and unload EDG.

- 1 — Select synchroscope for Bkr to be paralleled to "ON".
- 2 — Match voltages using exciter voltage adjust.
- 3 — Adjust speed to establish synchroscope moving slowly in the "SLOW" direction (counter-clockwise).
- 4 — Close oncoming Bkr at \approx 1 o'clock.
- 5 — Refer to OP-707, Operation of the ES Emergency Diesel Generators, Section 4.13, Operation Of EDG, for ES restoration.

3.32 — WHEN offsite power is available to Unit 4160V buses,
THEN energize unit buses.

- o Refer to OP-703, Plant Distribution System, Section 4.1, Normal Startup, to energize unit buses.

Applicable Carry-over steps:

3.9 IF at any time, letdown flow restoration is desired, THEN Refer to EOP-14, Enclosure 4...

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.33 — Exit this procedure.
GO TO applicable operating
procedures.

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

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 1

Note

Values listed in this table are slightly larger than actual values for the equipment. This is done to envelope possible small increases caused by maintenance, testing, or changes in operating mode.

EDG Loads

Loads	KW (running)	KW (starting)
AHF-1A/B/C	62	145
AHF-17A/B	51	175
AHF-18A/B	51	175
AHF-19A/B	19	60
AHF-54A/B	13	40
BSP-1A/B	225	630
CHP-1A/B	19	50
CHHE-1A/B	200	540
DCP-1A/B	80	165
DHP-1A/B	280	585
EFP-1	680	1485
MUP-1A/B/C	705	2085
RWP-2A/B	550	1540
RWP-3A/B	200	840
SWP-1A/B	515	1575
SFP-1A/B	43	145

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 2

EFP-2 Cross Connect to EFV-57 and EFV-58

ACTIONS

DETAILS

- 1 — Prepare EFW for cross connected operation.

- 1 Ensure EFP-2 discharge block valves are closed:

- 1 — Select EFIC to "MANUAL PERMISSIVE" on EFIC channel A.

- o — Close EFV-11

- o — Close EFV-32

- 2 Deenergize EFP-2 discharge block valves at DPDP-8C, located in the ES A 4160V switchgear room:

- DPDP-8C Switch 1, EFV-11 125V DC motor power

- DPDP-8C Switch 3, EFV-32 125V DC motor power

-
- 2 — IF EFP-2 is NOT running, THEN start EFP-2

- 1 — Ensure ASV-50, EFP-2 Trip Valve, is reset.

- 2 — IF EFP-2 has been stopped for < 15 minutes, THEN reset EFP-2 governor.

- 3 — IF EFP-2 is accessible, THEN ensure EFP-2 is ready to start.

- 4 — Open ASV-204

- 5 — IF EFP-2 is accessible, THEN ensure EFP-2 is operating normally.

-
- 3 — Cross connect EFP-2 to EFV-57 and EFV-58

- o — Notify PPO to open EFV-12

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 2 (CONT'D)

EFV-2 Cross Connect to EFV-57 and EFV-58

ACTIONS

DETAILS

4__ Remove EFIC from "MANUAL
PERMISSIVE" to restore overfill
protection.

o__ Depress both "EFW INITIATE"
pushbuttons on EFIC channel A.

5__ WHEN EFP-2 is supplying EFW to
OTSGs,
THEN stop EFP-1

o__ Place EFP-1 control handle in Pull
To Lock.

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 3

Failed EDG Recovery

ACTIONS

DETAILS

CAUTION

Do not attempt to energize a bus that has actuated overcurrent lockouts.

1 ___ Prevent EDG from starting during recovery efforts.

o ___ Notify PPO to select the "NORMAL AT ENGINE" switch to "AT ENGINE" on the tripped EDG gauge board.

2 ___ Ensure condition causing failure of the EDG is corrected.

3 ___ Prepare for EDG restart.

1 ___ Notify PPO to ensure 86 DG lockout is reset for affected EDG.

2 ___ Select MUPs on the dead bus to Normal After Stop.

3 ___ IF ES A 4160V Bus is dead, THEN place EFP-1 in Pull To Lock.

4 ___ IF the knife switch "AY", in "DUMMY" cubicle was opened per step 3.5, THEN notify available PPO to close knife switch "AY" in the "DUMMY" cubicle for the affected ES 4160V bus.

5 ___ Notify PPO to depress the "RESET" push button on the EDG gauge board.

6 ___ Wait at least 2 minutes to allow the shutdown relays to reset.

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 3 (CONT'D)

Failed EDG Recovery

ACTIONS

DETAILS

4 ___ Prepare affected bus for re-energization.

1 Ensure all feeder Bkrs to affected bus are open.

ES 4160V Bus Feeder Bkrs:

Feeder	A Bus	B Bus
BEST	___3205	___3206
Offsite	___3211	___3212
Aux	___3207	___3208

5 ___ Start the recovered EDG, AND energize the affected bus.

o ___ Notify PPO to select the "NORMAL AT ENGINE" switch to "NORMAL" on the EDG gauge board.

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

6 ___ IF EFP-1 is required, THEN start EFP-1

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 4

Energizing PZR Htrs, IAP-1A, DPBC-1G and DPBC-1I from ES A 4160V Bus

ACTIONS

DETAILS

Note

Action steps 1 through 5 establish power feeds for this Enclosure and only need to be performed once.

-
- | | | |
|---|---|--|
| 1 | ___ Ensure 480V Rx Aux Bus 3A feeder Bkrs are open. | o Ensure open:
___ Bkr 3305
___ Bkr 3395 |
|---|---|--|
-
- | | | |
|---|---|---|
| 2 | ___ Notify SPO to ensure open all Bkrs on 480V Rx Aux Bus 3A and PZR Htr MCC 3A | o All Bkrs open on:
___ 480V Rx Aux Bus 3A
___ PZR Htr MCC 3A |
|---|---|---|
-
- | | | |
|---|--|--|
| 3 | ___ Place IAP-1A control switch in "PULL TO LOCK". | |
|---|--|--|
-
- | | | |
|---|---------------------------------|---|
| 4 | ___ Energize 480V Rx Aux Bus 3A | o Close the following Bkrs:
___ Bkr 3321
___ Bkr 3395 |
|---|---------------------------------|---|
-
- | | | |
|---|-----------------------------|---|
| 5 | ___ Energize PZR Htr MCC 3A | o ___ Notify SPO to close Bkr 3355, Unit 1C, on Rx Aux Bus 3A |
|---|-----------------------------|---|
-

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 4 (CONT'D)

Energizing PZR Htrs, IAP-1A, DPBC-1G and DPBC-1I from ES A 4160V Bus

ACTIONS

DETAILS

- 6 — IF PZR Htrs are required,
THEN energize PZR control
power and energize 2
groups of Htrs.

- 1 — Ensure EGDG-1A capacity is
available for 275 KW.
o See Table 1, EDG Rating and
Enclosure 1, EDG Loads.

- 2 Notify SPO to close the following
Bkrs at PZR Htr MCC 3A:

— Unit 1A "PRESS HTR CONTROL
TRANSFORMER A-1"

— Unit 2A "PRESS HTR CONTROL
TRANSFORMER A-2"

- 3 Notify SPO to close 2 of the
following Bkrs at PZR Htr MCC 3A:

— Unit 4A "PRESS. HEATERS S.C.R.
GROUP 1"

— Unit 1C "PRESS. HEATERS GROUP
7"

— Unit 2C "PRESS. HEATERS GROUP
8"

— Unit 3C "PRESS. HEATERS GROUP
9"

-
- 7 — IF IAP-1A is required,
THEN establish IAP-1A
cooling from SW system and
start IAP-1A

- 1 — Ensure EGDG-1A capacity is
available for 85 KW.

o See Table 1, EDG Rating and
Enclosure 1, EDG Loads.

- 2 — Notify SPO 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

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 4 (CONT'D)

Energizing PZR Htrs, IAP-1A, DPBC-1G and DPBC-1I from ES A 4160V Bus

ACTIONS

- 8 — IF DPBA-1C recharge is required,
THEN place DPBA-1C on charge.

DETAILS

- 1 — Ensure EGDG-1A capacity is available for 175 KW.
o See Table 1, EDG Rating and Enclosure 1, EDG Loads.
- 2 — Notify SPO to open DPDP-1C switch 13
- 3 Notify SPO to close the following switches:
— DPDP-1C switch 4
— DPDP-1C switch 14
- 4 — Notify SPO to select DPXS-1C to the "POWER FROM PZR HTR MCC 3A" "ON" position.
- 5 Notify SPO to close PZR Htr MCC 3A Bkrs:
— Unit 3A "BATTERY CHGR DPBC-1G"
— Unit 3B "BATT CHGR DPBC-1I VIA DPXS-1C"

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 5

Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus

ACTIONS

DETAILS

Note

Action steps 1 through 6 establish power feeds for this Enclosure and only need to be performed once.

- 1 ☐ Ensure the listed 480V feeder and tie Bkrs are open.

o Ensure open:

- ☐ Bkr 3392 Plant Aux tie
- ☐ Bkr 3312 Plant Aux feeder
- ☐ Bkr 3306 Rx Aux 3B feeder
- ☐ Bkr 3396 Rx Aux 3B tie
- ☐ Bkr 3393 Turb Aux 3A tie
- ☐ Bkr 3394 Turb Aux 3B tie
- ☐ Bkr 3399 Heating Aux tie

-
- 2 ☐ Notify SPO to ensure open all Bkrs on 480V Plant Aux Bus, 480V Rx Aux Bus 3B, and PZR Htr MCC 3B

o All Bkrs open on:

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

-
- 3 ☐ Place IAP-1B control switch in "PULL TO LOCK".

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 5 (CONT'D)

Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus

ACTIONS

DETAILS

4 ☐ Energize 480V Plant Aux Bus.

o Close the following Bkrs:

☐ Bkr 3222

☐ Bkr 3312

5 ☐ Energize 480V Rx Aux Bus 3B.

o Close the following Bkrs:

☐ Bkr 3392

☐ Bkr 3396

6 ☐ Energize PZR Htr MCC 3B.

o ☐ Notify SPO to close Bkr 3356,
Unit 1C, on Rx Aux Bus 3B

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 5 (CONT'D)

Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus

ACTIONS

- 7 — IF PZR Htrs are required,
THEN energize PZR control
power and energize 2
groups of Htrs.

DETAILS

- 1 — Ensure EGDG-1B capacity is
available for 275 KW.
o See Table 1, EDG Rating and
Enclosure 1, EDG Loads.
- 2 Notify SPO to close the following
Bkrs at PZR Htr MCC 3B:
- Unit 1A "PRESS HTR CONTROL
TRANSFORMER B-1"
- Unit 1B "PRESS HTR CONTROL
TRANSFORMER B-2"
- 3 Notify SPO to close 2 of the
following Bkrs at PZR Htr MCC 3B:
- Unit 2A "PRESS HTRS SCR GROUP
2"
- Unit 3A "PRESS HTRS SCR GROUP
5"
- Unit 4A "PRESS HTRS SCR GROUP
6"
- Unit 1D "PRESS HTRS GROUP 1"
- Unit 2C "PRESS HTRS GROUP 11"
- Unit 3C "PRESS HTRS GROUP 12"
- Unit 4C "PRESS HTRS GROUP 13"

Table 1: EDG Rating

	Load range in KW
Maximum load	3422
30 min	3173 to 3422
200 hr	2923 to 3172
2000 hr	2773 to 2922
Continuous	0 to 2772

Enclosure 5 (CONT'D)

Energizing PZR Htrs, IAP-1B, DPBC-1H and DPBC-1I from ES B 4160V Bus

ACTIONS

DETAILS

- 8 — IF IAP-1B is required,
THEN establish IAP-1B
cooling from SW system and
start IAP-1B.

- 1 — Ensure EGDG-1B capacity is
available for 85 KW.
o See Table 1, EDG Rating and
Enclosure 1, EDG Loads.
- 2 — Notify SPO to line up SW cooling
for IAP-1B
o Refer to OP-408, Nuclear
Services Cooling System,
Section 4.6
- 3 — Start IAP-1B

- 9 — IF DPBA-1C recharge is
required,
THEN place DPBA-1C on
charge.

- 1 — Ensure EGDG-1B capacity is
available for 175 KW.
o See Table 1, EDG Rating and
Enclosure 1, EDG Loads.
- 2 — Notify SPO to open DPDP-1C
switch 14
- 3 Notify SPO to close the following
switches:
— DPDP-1C switch 5
— DPDP-1C switch 13
- 4 — Notify SPO to select DPXS-1C to
the "POWER FROM PZR HTR MCC 3B"
"ON" position.
- 5 Notify SPO to close PZR Htr MCC 3B
Bkrs:
— Unit 3BL "BATTERY CHGR
DPBC-1H"
— Unit 3BR "BATT CHGR DPBC-1I
VIA DPXS-1C"