

DOCUMENT TRANSMITTAL FORM 79331
FOR DOCUMENTS TRANSMITTED TO DC DESK(NRC)*

DATE: 15 SEP 1992
BATCH: 100

DOCUMENT NUMBER	SHEET NUMBER	REVISION NUMBER	COPY NUMBER
AP 380		21	7
AP 770		17	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- ☒ (3) DESTROY DOCUMENTS OR PORTIONS OF DOCUMENTS SUPERSEDED BY THE ABOVE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 X SA1G FLORIDA POWER CORP., P.O. BOX 219
CRYSTAL RIVER FLA. 34423-0219
- ☐ (7) QUALITY PROGRAMS PERSONNEL HAVE READ AND UNDERSTOOD THE CHANGES TO THE AFFECTED GAP'S

SIGNATURE OF ADDRESSEE

DATE

INDEPENDENT VERIFICATION

DATE

(OPS)

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ESA	REV 21	DATE 07/04/92	AP-380
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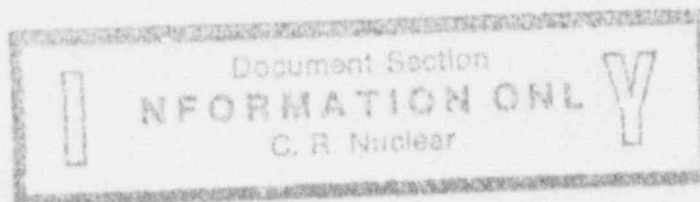
ENGINEERED SAFEGUARDS ACTUATION

1.0 ENTRY CONDITIONS

IF any of the following conditions exist:

- o Manual ES Actuation,
- o RCS PRESS is < 1500 PSIG,
- o RB PRESS is > 4 PSIG,

THEN use this procedure.



This Procedure Addresses Safety Related Components		
Approved by NOS <i>[Signature]</i> Date <i>9-15-92</i>		
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2.0 IMMEDIATE ACTIONS

ACTIONS

DETAILS

- 2.1 Ensure ES status lights are blue for the actuated systems.

CAUTION

IF RCPs have NOT been stopped within 2 min from the time that adequate subcooling margin was lost,
THEN RCPs must remain running to prevent core damage.

- 2.2 Verify adequate subcooling margin.

IF adequate subcooling margin does NOT exist,
THEN stop all RCPs.

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

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3.0 FOLLOW-UP ACTIONS

ACTIONS

3.1 — Notify personnel of plant conditions as required.

DETAILS

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

3.2 — CONCURRENTLY PERFORM
VP-580, Plant Safety
Verification Procedure,
beginning with Step 1.1.

Table 1: T_{sat} 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

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

IF RCPs have NOT been stopped within 2 min from the time that adequate subcooling margin was lost,
THEN RCPs must remain running to prevent core damage.

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

___ Stop all RCPs,

___ Raise OTSG levels to 80-90% using EFW,

___ Start full HPI.

See Table 1 for adequate subcooling margins.

Stop all RCPs and ensure Oil Lift pumps start.

Raise OTSG level to 80-90%:

1. Ensure both EFW trains are initiated.
2. Depress "95%" level select pushbuttons on OTSG A and B.

Start full HPI:

1. ___ Open MUP suction valves from BWST:
o MUV-73 o MUV-58
2. ___ Ensure 2 MUPs and their cooling water pumps are operating.
3. Open all 4 HPI valves:
___ MUV-23 ___ MUV-24
___ MUV-25 ___ MUV-26.

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

- 3.4 — IF adequate subcooling margin does NOT exist, AND all RCPs have NOT been stopped within 2 min, THEN reduce operating RCPs to 1/loop.

NOTE

IF HPI flow is ≥ 200 gpm for any nozzle, as indicated on the narrow range HPI flow instrument, THEN use the wide range HPI flow instrument for that nozzle on ES Section of Main Control Board.

- 3.5 — IF at anytime while performing this procedure an HPI actuation is present, THEN bypass HPI actuation, AND balance HPI flows.

1. Select the following to "BYPASS" on both A and B HPI channels:

— "HPI RC1"

— "HPI RC2"

— "HPI RC3"

2. Close MUV-27.

3. IF 1 HPI line flow indicates off scale high as indicated on the narrow range HPI flow instrument and is verified to be a high flow condition using the wide range indication, THEN isolate the high line, AND balance the other 3 lines.

IF-NOT,
THEN balance all 4 HPI lines.

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

NOTE

LPI will not automatically actuate at 4 PSIG RB PRESS during a loss of off-site power.

3.6 IF, at anytime while performing this procedure, LPI actuation is present,

AND RCS pressure is > 500 PSIG

THEN:

___ Stop both LPI pumps.

___ Go to step 3.10 of this procedure.

1. Reset LPI bistables:

- ___ RC4 in ACT. CHAN.
CAB #1
- ___ RC5 in ACT. CHAN.
CAB #2
- ___ RC6 in ACT. CHAN.
CAB #3

2. STOP DHP-1A and DHP-1B

3.7 IF, at anytime while performing this procedure, LPI actuation is present, AND RCS pressure is < 500 PSIG AND LPI flow is > 300 GPM / pump

THEN:

___ Ensure proper operation

___ Bypass LPI actuation

___ Go to step 3.10 of this procedure.

o Ensure DHV-110 and DHV-111 are operating properly.

o Select the following to "BYPASS" on both A and B channels:

- ___ "LPI RC4"
- ___ "LPI RC5"
- ___ "LPI RC6"

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

NOTE

RCS pressure > 100 psig or LPI flow > 2,000 gpm could produce a $\Delta P > 100$ psi across DHV-7 & 8. DHV-7 & 8 may not open under these high ΔP conditions.

3.8 IF at any time in this procedure
ONE LPI pump is unavailable
AND LPI flow through BOTH
LPI trains is desired
THEN crossed the LPI trains

1. ___ Ensure one LPI train is in operation.
2. ___ Close the flow control valve on the unavailable LPI pump.
3. ___ Reduce the DP across DHV-7 and DHV-8 with any of the following methods:
 - o ___ Ensure RCS pressure is <100 psig
 - o ___ Adjust the flow control valve on the operating LPI pump for < 2,000 gpm
4. ___ Open the crosstie valves:
 - o ___ DHV-7
 - o ___ DHV-8
5. ___ Balance flows to the LPI trains
 - o ___ Monitor DH-38-FI for crossover flow.
 - o ___ Inrottle DHV-5 and DHV-6 to balance flows.
 - o ___ Adjust the flow control valve on the operating LPI pump for the desired total flow.

Table 1: T_{sat} 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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.9 ____ IF, at anytime while performing this procedure, LPI has or should have actuated,
AND LPI flow is < 300 gpm/pump,
THEN perform the following:

- 1 ____ Ensure LPI status lights are blue
- 2 ____ Ensure LPI is bypassed
- 3 ____ Increase LPI flow
- 4 ____ GO TO Step 3.10

DETAILS

- o Select both A and B channels to "BYPASS":

____ "LPI RC4"
____ "LPI RC5"
____ "LPI RC6"

- o Increase LPI flow as follows:

After performing each step determine if LPI flow is > 300 gpm/pump.

IF LPI flow develops > 300 gpm/pump,
THEN GO TO Step 3.10 of this procedure.

- 1 ____ Ensure DHV-110 and DHV-111 are open.

- 2 ____ Open the PORV, RCV-10.

____ Perform Step 3.13 in this procedure to align HPI suction from LPI,
THEN RETURN TO this step.

- 4 ____ Open High Point vents:

PZR	Hot Leg "A"	Hot Leg "B"
RCV-159	RCV-157	RCV-163
RCV-160	RCV-158	RCV-164

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

NOTE

Only 2 out of 3 RB isolation actuation channels will bypass.

- 3.10 IF RBIC actuation is present,
THEN perform the following:
- 1 Ensure all RBIC status lights are blue
 - 2 Bypass RBIC
 - 3 IF RCPs are running,
THEN restore RCP services.
- o Select "BYPASS" on both A and B channels of RBIC:
 - "RB ISO RB1"
 - "RB ISO RB2"
 - "RB ISO RB3"
 - o Restore RCP services:
 - 1 Select OPEN on the "ES TRAIN (B) NON-ESSEN. VALVES" switch
 - 2 Open RCP controlled bleed-off valves:
 - MUV-253
 - MUV-258 MUV-259
 - MUV-260 MUV-261

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.11 — IF RB Spray actuation is present,
THEN ensure proper RB Spray flow
AND isolate BST-1 as required.

DETAILS

- o Ensure BSV-3 and BSV-4 are regulating flow at 1500 to 1600 gpm.
- o IF either BSP does NOT start,
THEN close discharge valve on affected pump:
 - o BSP-1A: BSV-3
 - o BSP-1B: BSV-4
- o IF RCS PRESS > 200 PSIG,
THEN isolate BST-1.
- o Close BSV-11 and BSV-12

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Steps 3.12 and 3.13 must be completed to prevent RB WATER LEVEL from reaching 5' to preclude degrading instrument transmitters and low elevation containment isolation valves.

CAUTION

Due to MUV-62 being normally closed, both DH trains are required to be in operation to ensure suction to all MUPs.

3.12 IF at any time while performing this procedure, RB WATER LEVEL indicates $\geq 2.2'$, THEN transfer LPI pump suction from the B&I to the RB sump AND isolate BST-1.

1. Ensure flow exists in both LPI trains
2. Throttle LPI flow for each running LPI pump to ≈ 2000 gpm using DHV-5 and DHV-6
3. Ensure 1200 gpm and "LOCAL" are selected for:
 - o BSV-3
 - o BSV-4
4. Open RB sump outlet valves:
 - o DHV-42
 - o DHV-43
5. WHEN RB sump outlet valves indicate open, THEN close BWST outlet valves:
 - o DHV-34
 - o DHV-35
6. Close BST-1 outlet valves:
 - o BSV-12
 - o BSV-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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

Due to MUV-62 being normally closed, both DH trains are required to be in operation to ensure suction to all MUPs.

NOTE

When HPI suction is supplied from LPI, HPI flow must be added to LPI flow to determine total flow.

3.13 WHEN LPI suction is assigned to the RB sump,
OR as directed by Step 3.9,
THEN establish HPI suction from LPI.

1. Open:
 - o DHV-11
 - o DHV-12

2. Close:

Continue on in this procedure.

- o MUV-73
- o MUV-58

NOTE

IF loss of subcooling was due to an overcooling event,
THEN OTSG PRESS control should be regained prior to raising OTSG level.

3.14 IF ES actuation is due to an overcooling event,
THEN determine cause,
AND stop overcooling.

Observe for:

- o Low OTSG PRESS,
- o High OTSG level,
- o High MFW or EFW flow.
- o SPDS trace indicating overcooling.

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.15 — Isolate possible sources
of low RCS PRESS.

DETAILS

1. Isolate the following:
 - o IF the PORV is NOT
required to be opened,
THEN close RCV-11,
PORV block.
 - o Close the following letdown
coolers inlet valves:
 - MUV-38,
 - MUV-39,
 - MUV-498.
 - o Close RCV-13, PZR spray
block valve.
 - o Ensure DHV-3 is closed.
2. Reopen RCV-11 while observing RCS
PRESS.
3. IF desired,
THEN restore letdown path while
observing RCS PRESS.
4. IF desired,
THEN open RCV-13, PZR spray block
valve, while observing RCS PRESS.

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RR WATER LEVEL indicates ≥ 2'2"

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

Table 2: Required OTSG Levels

Condition	Required Level	EFIC Setpoint Select
Inadequate subcooling Margin	80-90%	"95%"
No RCPs Running, Adequate Subcooling Margin Exists	60-70%	"65%"
RCPs Running, Adequate Subcooling Margin Exists	Low Level Limits	"30 inches"

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

NOTE

High RB TEMP may cause level instrumentation located inside the RB to read 10% higher than actual.

NOTE

EFW-1 will automatically trip upon actuation of LPI coincident with a loss of off-site power.

NOTE

EFIC control valves will not feed the OTSG until the EFIC setpoint ramps up to meet actual OTSG level.

3.16 — Ensure EFW is actuated and selected to required OTSG setpoint.

- o See Table 2 for required OTSG levels.
- o IF Adequate subcooling margin does NOT exist, AND OTSG levels are NOT continuously progressing towards setpoint, THEN place EFIC level control in manual and maintain EFW flow ≥ 200 gpm to each JTSG OR ≥ 400 gpm to one OTSG until 80-90% level.

IF EFW and MFW are NOT available,
THEN GO TO Step 3.42 in this procedure.

IF EFW is NOT available,
THEN CONCURRENTLY PERFORM AP-450, EFW Actuation, beginning with Step 3.9.

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

3.3 If adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates ≥ 2'2"

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

Table 2: Required OTSG Levels

Condition	Required Level	EFIC Setpoint Select
Inadequate subcooling Margin	80-90%	"95%"
No RCPs Running, Adequate Subcooling Margin Exists	60-70%	"65%"
RCPs Running, Adequate Subcooling Margin Exists	Low Level Limits	"30 inches"

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.17 — WHEN LPI flow is ≥ 1000 GPM in each injection line, THEN isolate CFTs.

DETAILS

1 — Notify AB operator to remove locks and close Bkrs for CFT isolation valves at ES MCC-3AB:

o CFV-5 o CFV-6

2 — Close:

o CFV-5 o CFV-6

3.18 — IF at any time while performing this procedure, RCS PRESS is > 2400 PSIG, THEN reduce RCS PRESS based on subcooling margin.

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

IF adequate subcooling margin exists, THEN open PORV to reduce RCS PRESS until:

o RC PRESS ≈ 100 PSIG $>$ adequate subcooling margin curve

OR

o RCS PRESS ≈ 1600 PSIG

o High Point vents:

IF PORV is NOT available, THEN use High Point vents.

PZR	Hot Leg "A"	Hot Leg "B"
RCV-159	RCV-157	RCV-163
RCV-160	RCV-158	RCV-164

Table 1: Tsat Monitor Adequate Subcooling Margin

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates ≥ 2'2"

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

Table 2: Required OTSG Levels

Condition	Required Level	EFIC Setpoint Select
Inadequate subcooling Margin	80-90%	"95%"
No RCPs Running, Adequate Subcooling Margin Exists	60-70%	"65%"
RCPs Running, Adequate Subcooling Margin Exists	Low Level Limits	"30 inches"

3.18 IF RCS PRESS is > 2400 PSIG,
THEN reduce RC PRESS based on subcooling margin.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

HPI flows must not be throttled to < 100 gpm/pump with MUP recirc valves closed, to prevent pump damage.

- 3.19 ____ IF HPI throttle requirements are met,
THEN throttle HPI as required.
- o MUP recirc valve operation:
 - o MUP recirc valves are NOT required to be open when throttling HPI to prevent pump runoff.
 - o MUP recirc valves must be opened prior to throttling HPI to < 100 gpm/pump.
 - o MUP recirc valves:
 - o MUV-53
 - o MUV-257.
 - o HPI throttle requirements:
 - o HPI must be throttled to maintain subcooling margin < 100°F when no RCPs are operating.
 - o IF adequate subcooling exists based on incores, THEN HPI must be throttled to maintain RCS PRESS and TEMP below the NDT curve, see SPDS or Enclosure 2.
 - o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
 - o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
 - o HPI may be throttled when adequate subcooling margin exists based on incores.

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

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates ≥ 2'2"

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,

THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin < 100°F when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS	DETAILS
3.20 WHEN either OTSG PRESS is between 725 and 600 PSIG, THEN bypass EFIC MS and MFW isolation actuations.	Depress "< 725 PSI OTSG PRESS EFIC ACT. BYPASS" pushbuttons: ____ Channel A ____ Channel B ____ Channel C ____ Channel D.
Continue on in this procedure.	

Note

Subcooling margin should be closely observed after starting each RCP.

- 3.21 IF, at any time while performing this procedure, RCPs are available, AND ≥ 1 OTSG is available, THEN start 1 RCP in each loop.
OR 2 RCPs in 1 loop
- IF RCPs are available, AND OTSGs are NOT available, THEN start 1 RCP.
- o RCPs are available when all the following exist:
 - o RCP start permissives are met,
 - o RCS PRESS and TEMP are above RCP NPSH curves, see SPDS or Enclosure 1,
 - o Adequate subcooling margin, see Table 1.
 - o OTSGs are available when all the following exist:
 - o LFW or MFW or AFW available,
 - o TBVs or ADVs available,
 - o OTSG integrity.
 - o Establish RCP-1B operating for maximum PZR spray.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.22 — IF at any time while performing this procedure, adequate subcooling margin is established, AND Nat Circ is desired, THEN CONCURRENTLY PERFORM AP-530, Nat Circ, beginning at Step 3.5.

Nat Circ is desired when all of the following conditions exist:

- o RCPs are NOT available,
- o ≥ 1 OTSG is available.

3.23 — Establish and maintain OTSG Tsat 40 to 60°F below incore TEMP until OTSG heat removal is established.

Lower OTSG PRESS using TBVs or ADVs.

3.24 — IF adequate subcooling margin does NOT exist, AND RCS cooldown rate is $<$ desired, THEN determine if RCPs should be bumped.

RCPs should be bumped when all of the following conditions exist:

- o RCS cooldown rate is $<$ desired.
- o RCP power is available.
- o All RCP start permissives are met.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,

THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

NOTE

HPI flow may affect the indications of Nat Circ.

NOTE

Subcooling margin should be closely observed after each RCP bump.

NOTE

EFIC will automatically select low level limit control of OTSG level when any RCP is started.

NOTE

Bumping RCPs may result in OTSG pressure swings which could cause MS/MFW isolation actuation.

3.25 — IF RCPs should be bumped,
THEN bump RCPs at ≈ 15 min
intervals and observe for
saturated Nat Circ after
each bump.

- o To bump a RCP, start it, wait for current to drop off to normal, then stop it.
- o First RCP bump should be in the loop with the highest OTSG level.
- o Balance the bumps between available RCPs.
- o Record the times of the RCP bumps.
- o _____
- o _____
- o Indications of saturated Nat Circ are:
- o $T_c \approx T_{sat}$ of OTSG.
- o T_c and incores lower when OTSG PRESS is lowered.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 30-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$
3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,
THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain P2R level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.26 IF OTSG heat removal is established,
THEN ensure PORV is closed,
AND ensure High Point vents are closed.

DETAILS

1. Ensure PORV is closed.
2. Verify PORV closed using ultrasonic flow indication.
3. Ensure High Point vents are closed

PZR	Hot Leg "A"	Hot Leg "B"
RCV-159	RCV-157	RCV-163
RCV-160	RCV-158	RCV-164

CAUTION

HPI flow must not be throttled to < 100 gpm/pump with MUP recirc valves closed, to prevent pump damage.

- 3.27 IF RCS cooldown can be controlled,
THEN maintain RCS cooldown within limits.

RCS Cooldown Rate Limits:

	RCS TEMP °F	LIMIT
Normal	> 280	≤ 50°F ¼hr
	280 to 150	≤ 25°F ¼hr
	≤ 150	≤ 10°F/hr
Nat Circ	> 280	≤ 10°F/hr
	280 to 150	≤ 5°F/hr
	≤ 150	≤ 2.5°F/hr
	Enclosure 3	≤ 50°F/hr
OTSG Tube Leak	Refer to EP-390 Table 3	

Maintain RCS cooldown rate:

- o Throttle TBVs or ADVs.
- o Throttle EFIC control valves.
- o IF adequate subcooling margin exists,
THEN throttle HPI flows.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exist: based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.28 IF RCS PRESS lowers to 700 PSIG,
AND adequate subcooling margin exists,
THEN isolate CFTs,
AND bypass LPI actuation.

DETAILS

1. Notify AB Operator to remove locks and close Bkrs for CFT isolation valves at ES MCC 3AB.
2. Close:
 - o CFV-5 o CFV-6.
3. Select the following to "BYPASS" on both A and B LPI channels:
 - LPI RC4,
 - LPI RC5,
 - LPI RC6.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.29 — IF conditions exist to stop HPI,
THEN:

1. — Ensure PORV closed.
2. — Ensure High Point vents are closed,
3. — Stop HPI.

DETAILS

- o Stop HPI if all of the following conditions exist:
 - o Adequate subcooling margin,
 - o PZR level $i \geq 50"$,
 - o OTSG heat removal,
 - o Leak is within normal make-up capabilities.
- o PORV is RCV-10
- o High Point vents:
 - o RCV-159 o RCV-160
 - o RCV-157 o RCV-158
 - o RCV-163 o RCV-164
- o Stop HPI:
 1. — Ensure MUV 27 is open,
 2. — Ensure MUP recirc valves are open,
 - o MUV-53 o MUV-257
 3. — Close all HPI injection valves:
 - MUV-23 — MUV-24
 - MUV-25 — MUV-26
 4. — Ensure 1 MUP in service.

3.30 — IF EF Tank is < 8 ft,
THEN CONCURRENTLY PERFORM AP-450, EFW Actuation, beginning with Step 3.18.

3.31 — IF PZR bubble is desired,
THEN refer to OP-305, Operation of the PZR, Section 4.2.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,

THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.32 — IF cooldown is on 1 OTSG,
THEN ensure tube to shell
 ΔT on idle OTSG is
maintained within limits.

OTSG shell temps:

A OTSG SP-3A-TI or R-771

B OTSG SP-3B-TI or R-772

$T_{\text{shell}} - T_c = \text{Tensile } \Delta T$

$T_h - T_{\text{shell}} = \text{Compressive } \Delta T$

o Tensile limit is 100°F, tubes
colder than shell.

IF tensile limit is approached,
THEN reduce cooldown rate.

o Compressive limit is 60°F, tubes
hotter than shell.

IF compressive limit is
approached,
THEN increase cooldown rate using
TBVs or ADVs without exceeding
cooldown rate limits.

3.33 — IF EDGs are NOT energizing
the ES busses,
THEN stop EDGs.

1. — Ensure HPI is bypassed or
reset

2. — Depress the STOP pushbutton
for the affected EDGs

3.34 — IF boron concentration of
RB sump could have been
diluted by significant
steam or FW leaks in the RB,
THEN notify Chemistry to
sample RB Sump.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs.
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,
THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

HPI flow must NOT be throttled < 100 gpm/pump with MUP recirc valves closed, to prevent pump damage.

3.35 IF LPI flow is > 1000 gpm
per injection line for
for \geq 20 min.
THEN:

Stop HPI,

Stop HPI:

Ensure PORV is closed,

1. Stop all MUPs

Select PORV to
"Low Range",

2. Close all HPI
injection valves:

MUV-23 MUV-24
MUV-25 MUV-26

3. Open MUP recirc valves:

MUV-53 MUV-257

Ensure all high point
vents are closed.

Ensure closed:

RCV-159 RCV-160
RCV-157 RCV-158
RCV-163 RCV-164.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

- 3.36 — IF adequate subcooling margin exist,
AND both LPI trains are available,
THEN establish 1 LPI train in the DHR mode.

Refer to OP-404, Decay Heat Removal System, Section 4.12.

- 3.37 — WHEN LPI or DHR is supplying core cooling,
THEN stop OTSG cooling.

Continue on in this procedure.

1. — Stop MFW, EFW and AFW pumps
2. — Ensure the following valves are closed:

VALVE	A OTSG	B OTSG
MBV	FWV-30	FWV-29
LLBV	FWV-31	FWV-32
SUCV	FWV-40	FWV-39
MS to EFP-2	MSV-55	MSV-56
MS to TBVs and MFWPs	MSV-53	MSV-54
EFW BLOCK VALVES	EFV-11 EFV-14	EFV-32 EFV-33
AFW Iso. VALVES	FWV-222	FWV-223
MS to MSks	MSV-30 MSV-32	MSV-29 MSV-31

- 3.38 — WHEN RB PRESS is < 10 PSIG and not rising,
THEN stop RB spray.

Continue on in this procedure.

1. — Stop BSP-1A and BSP-1B.
2. — Select LOCAL/MANUAL,
THEN close control valves:
 - o — BSV-3
 - o — BSV-4
3. — Depress "HPI SEAL IN RESET" pushbuttons on both ES channels.
4. — IF RB PRESS increases to 10 PSIG,
THEN reestablish RB spray.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

NOTE

RB Cooling Fans should stay in operation, til RB H₂ levels are known, in order to provide mixing of RB atmosphere.

3.39 — Notify Operator to begin monitoring RB atmosphere H₂ level.

Refer to EM-308, Post Accident monitoring of the RB Atmosphere.

3.40 — WHEN RB PRESS < 4 PSIG,
THEN ensure RB isolation is reset.

Select the following to "RESET" on both A and B channels:

— "RB ISO RB1"

— "RB ISO RB2"

— "RB ISO RB3"

3.41 — GO TO applicable procedure based on subcooling margin:

IF adequate subcooling margin exists,
THEN GO TO OP-209, Plant Cooledown.

IF adequate subcooling does NOT exist,
THEN GO TO OP-404, Decay Heat Removal System, Section 4.13, to establish long term core cooling.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,

THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

The following steps are to initiate HPI/PORV cooling.

Note

Steps establishing HPI/PORV cooling and AFW may be performed concurrently.

CAUTION

HPI cooling must be established prior to any opening of the PORV.

3.42 ___ Start full HPI.

1. Open MUP suction from the BWST:
 - o MUV-58 o MUV-73.
2. Ensure 2 MUPs and their cooling water pumps are running.
3. Open HPI Valves:

___ MUV-23	___ MUV-24
___ MUV-25	___ MUV-26.
4. Balance flow between available injection lines.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$
3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,
THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

- 3.43 — IF OTSG heat removal is NOT available,
AND only 1 MUP is available,
THEN open the PORV to
increase HPI flow.

IF PORV is NOT available,
THEN use High Point vents.

DETAILS

- o PORV should be left open until any of the following conditions exist:
- o HPI can be stopped,
- o OTSG heat removal is established.
- o High Point vents:

PZR	Hot Leg "A"	Hot Leg "B"
RCV-159	RCV-157	RCV-163
RCV-160	RCV-158	RCV-164

NOTE

≥ 1 OTSG should be $\geq 6"$ prior to closing the PORV.

- 3.44 — Open the PORV before
exceeding RCS PRESS
limits.

IF PORV is NOT available,
THEN use High Point vents.

1. — Ensure RCV-11, PORV
block, is open.
2. — Open PORV before:
 - o Exceeding PTS limits,
 - o Exceeding NDT limits,
 - o Exceeding 2400 PSIG.
3. — Verify PORV is open using
ultrasonic indications.
 - o High Point vents:

PZR	Hot Leg "A"	Hot Leg "B"
RCV-159	RCV-157	RCV-163
RCV-160	RCV-158	RCV-164

- o Maintain PORV or High Point vents
open until OTSG heat removal is
established or LPI is providing
core cooling.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicators $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,
THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

AFW is supplied to the OTSG's via the EFW nozzles. The normal suction for AFW is the CST, EFT-2 and the Hotwell are alternate sources. Guidance for swapping to the alternate suction sources is contained in OP-605

3.45 IF AFW is available
THEN feed OTSGs using AFW.

- o ___ Start FWP-7
 - o ___ Notify plant operator to OPEN:
 - o FWV-222, 119' IB, A OTSG iso.
 - o FWV-223, 119' IB, B OTSG iso.
 - o ___ Maintain total indicated AFW flow \leq 590 GPM to prevent pump runout.
 - o ___ Control AFW using FWV-216 and FWV-217 to obtain desired flow to OTSGs.
-

3.46 ___ IF >1 RCP is operating,
THEN reduce operating RCPs to 1.

Maintain RCP-1B operating to maximize PZR spray.

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,
THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

3.47 — WHEN RCS is < 1700 PSIG,
THEN bypass HPI.

Continue on in this
procedure.

DETAILS

Bypass HPI by selecting the
following to "BYPASS" on both
A and B channels:

— "HPI RC1",

— "HPI RC2",

— "HPI RC3".

3.48 — Select both RB sump pumps
to "PULL TO LOCK".

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,

THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.49 ____ Establish RB cooling.

- o Ensure all RB cooling fans are operating in slow speed.
- o Ensure RB cooling fans are on SW cooling.

NOTE

WHEN RCS TEMP < 425°F AND OTSG PRESS < 400 PSIG,
THEN MFWBPs may be used to recover from HPI/PORV cooling.

NOTE

HPI bistables may need to be reset prior to or during recovery from HPI/PORV cooling to prevent an inadvertent HPI actuation.

3.50 ____ Ensure feedwater valves are aligned to prevent inadvertently feeding an OTSG.

Ensure the following valves are selected closed:

Valve Ident.	A-OTSG	B-OTSG
Main Block	FWV-30	FWV-29
LL Block	FWV-31	FWV-32
LL Control	FWV-37	FWV-38
SU Control	FWV-40	FWV-39

3.3 IF adequate subcooling margin does NOT exist,
THEN:

- o Within 2 min, stop all RCPs,
- o Raise OTSG levels to 80-90% using EFW,
- o Start full HPI.

3.12 IF RB WATER LEVEL indicates $\geq 2'2"$

3.13 THEN transfer LPI suction to RB sump
AND establish HPI suction from LPI.

3.18 IF RCS PRESS is > 2400 PSIG,

THEN reduce RC PRESS based on subcooling margin.

3.19 IF HPI throttle requirements are met,

THEN throttle HPI flows as required.

- o HPI must be throttled to maintain subcooling margin $< 100^{\circ}\text{F}$ when no RCPs are operating.
- o IF adequate subcooling margin exists based on incores
THEN HPI must be throttled to maintain RCS PRESS and TEMP below NDT curve.
- o HPI must be throttled to maintain HPI flow < 540 gpm/pump.
- o HPI should be throttled to maintain PZR level 80" to 220" WHEN adequate subcooling margin exists based on incores.
- o HPI may be throttled when adequate subcooling margin exists based on incores.

3.21 IF RCPs are available,
AND OTSGs are available,
THEN start 1 RCP in each loop.

IF RCPs are available,
AND OTSGs are NOT available,
THEN start 1 RCP.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

During the transition from AFW to EFW, flow to the high nozzles should be maintained < 1400 gpm per OTSG to prevent exceeding OTSG cross flow limits.

- 3.51 WHEN MFW or EFW become available,
THEN CONCURRENTLY PERFORM AP-450, EFW Actuation, beginning with Step 3.9.

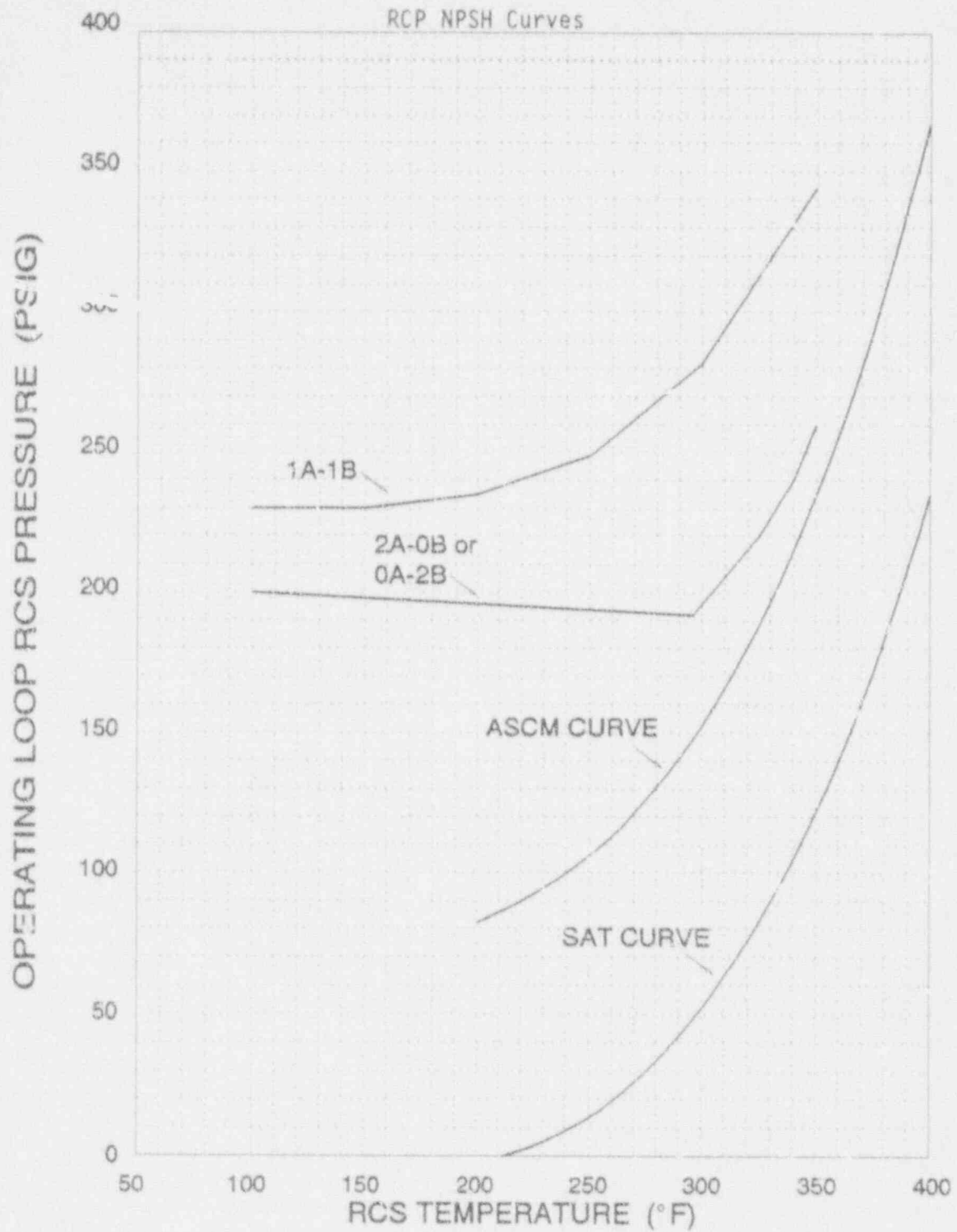
Continue on in this procedure.

-
- 3.52 IF AFW is running
AND EFW or MFW has been established
THEN stop AFW
- o Close FWV-216 and FWV-217,
(AFW control valves)
 - o Stop FWP-7
 - o Close FWV-222
(A OTSG manual Isolation location 119' IB)
 - o Close FWV-223
(B OTSG manual Isolation location 119' IB)
-

- 3.53 GO TO Step 3.19 in this procedure.

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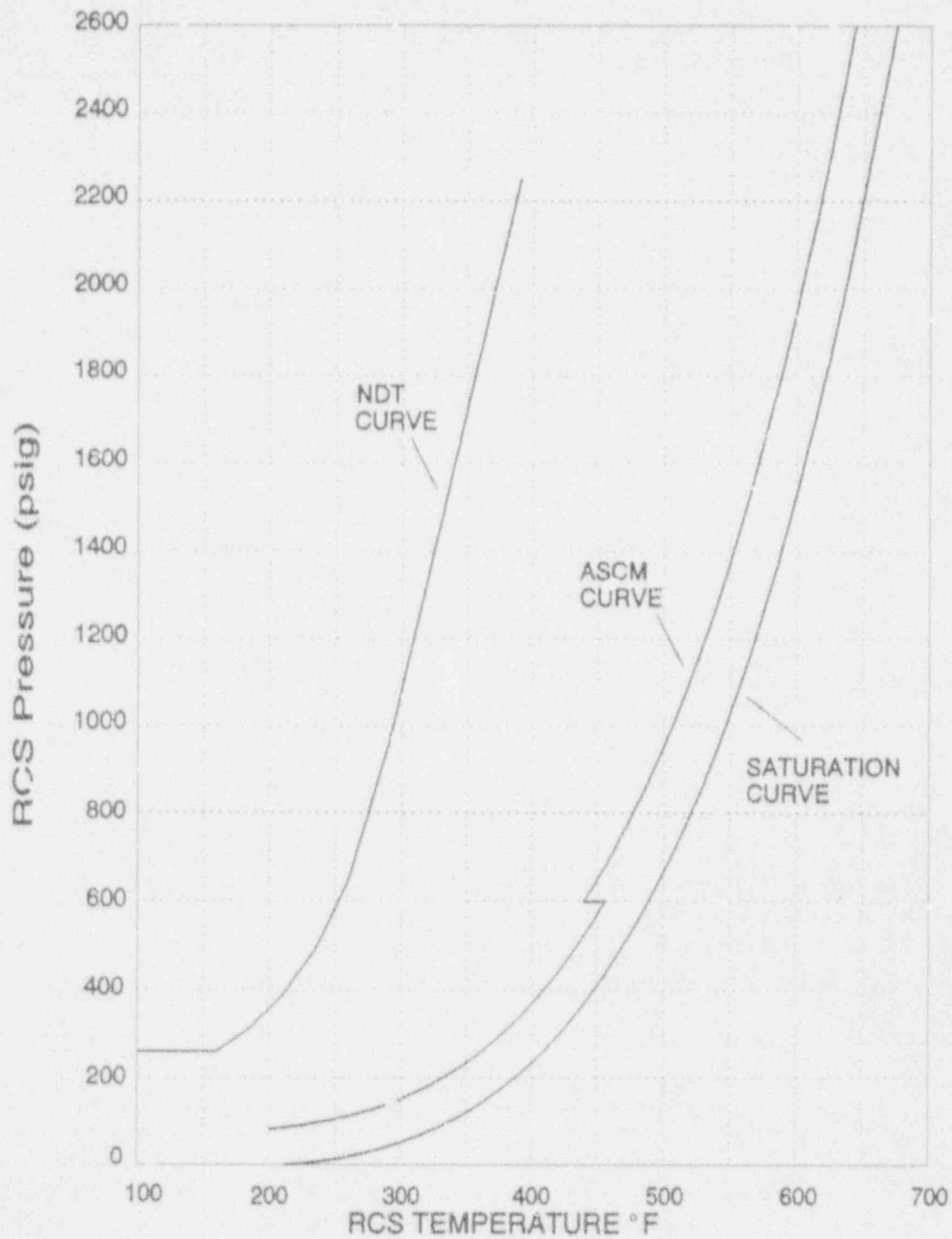
Enclosure 1



The acceptable region is above the applicable NPSH curve.

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Enclosure 2
Cooldown Curves

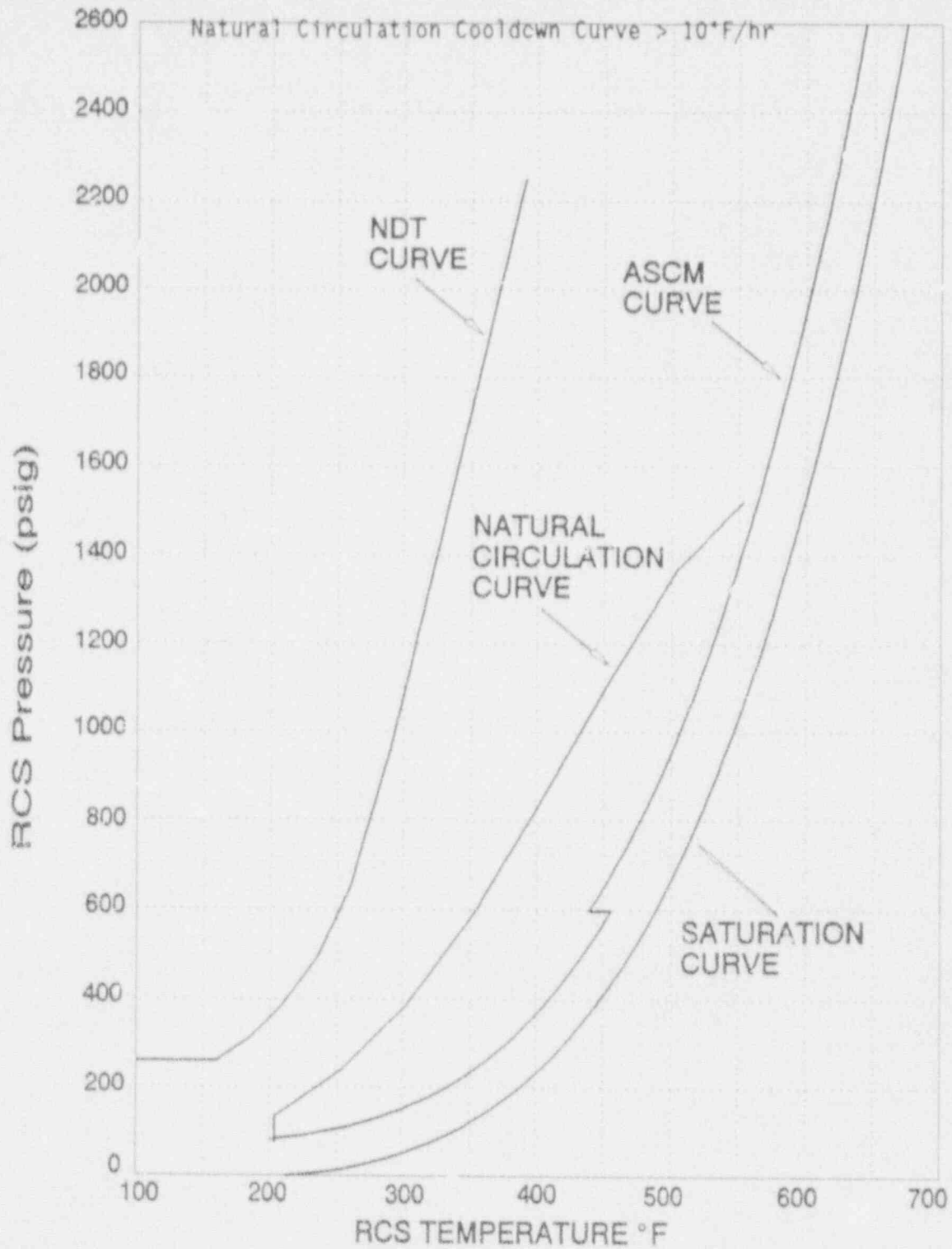


Acceptable region is:

- o below and to the right of the NDT curve
- o above and to the left of the ASCM curve

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Enclosure 3



Acceptable region is:

- o below and to the right of the NDT curve
- o above and to the left of the Natural Circulation curve
- o above and to the left of the ASCM curve

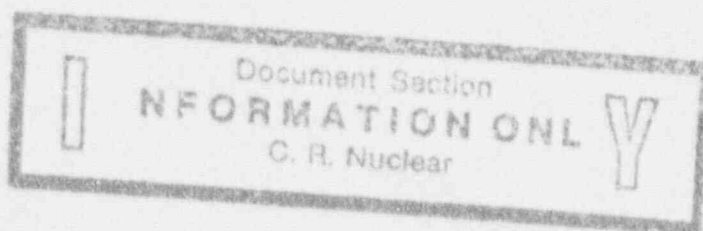
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EMERGENCY DIESEL GENERATOR ACTUATION

1.0 ENTRY CONDITIONS

IF 4160V ES Bus undervoltage occurs,

THEN use this procedure.



This Procedure Addresses Safety Related Components		
Approved by NOS <i>R. M. A. G. W. Marshall</i> Date <i>9-15-92</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 ≤ 3500
200 hr	> 3000 to ≤ 3250
2000 hr	> 2850 to ≤ 3000
Continuous	≤ 2850 KW

Table 2: EDG Loads to Shed

LOADS	KW
EFB-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 bus.

IF NOT energized.
THEN align affected bus to Unit 3 Startup Transformer.

DETAILS

1. — Ensure all feeder breakers to the affected bus are open.
2. — IF in Mode 1-4
THEN Ensure at least 1 4160V Unit Bus is either:
 - o — De-energized
 - OR
 - o — Aligned to the Auxiliary Transformer.
3. — Close feeder breaker from Unit 3 Startup Transformer for affected 4160V ES Bus by holding in "CLOSE" ≈ 10 sec:
 - o — Bkr 3205, Bus 3A
 - o — Bkr 3206, Bus 3B

- 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 \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 (CONT'D)

ACTIONS	DETAILS
3.5 — IF EDG energizes the bus and then trips, THEN reset the "4160V ES BUS ES/UV BLOCK LOCK OUT" AND energize the bus.	Refer to OP-703, Plant Distribution System, Section 4.23.
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.

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
EEP-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
NOT energized,
THEN ensure ES MCC-3AB is
aligned to energized ES
480V Bus

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,
THEN start MUP,
AND establish RCP seal
injection.

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 oil pump
6. — Start ES selected MUP.
7. — Throttle open, MUV-16, to
obtain 2 gpm/RCP.
8. — Place MUV-31 in AUTO at
desired setpoint
9. — 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,
THEN ensure EDG capacity
for 693 KW additional load
exists prior to starting.

- 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
EGP-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

- 3.10 — IF RCS was on Decay Heat Removal,
AND DHP restart is required,
THEN verify prerequisite conditions as directed by SSOD.

Refer to OP-404, Decay Heat Removal System, Section 4.5.

-
- 3.11 — IF SW Raw Water PRESS has NOT recovered,
THEN 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

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.

DETAILS

- 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
EFB-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 Mr 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)

<u>ACTIONS</u>	<u>DETAILS</u>
3.17 — Start control complex ventilation.	<ol style="list-style-type: none"><li data-bbox="888 331 1480 461">1. — Ensure EDG has enough capacity to supply desired loads, see Tables 1, 2 and 3.<li data-bbox="888 495 1480 624">2. — Start normal control complex ventilation. Refer to OP-409, Plant Ventilation, Section 4.2.<li data-bbox="888 658 1480 1012">3. — Start control complex chiller. Refer to OP-409, Plant Ventilation, Section 4.10. <u>IF</u> control complex chillers are <u>NOT</u> available, <u>THEN</u> refer to OP-409, Plant Ventilation, Section 4.3 for Appendix R chillers, <u>OR</u> 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
EEP-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	51

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 voltage 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. |
|------|--|---|

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
EEP-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

3.21 GO TO applicable operating
procedures
AND exit this procedure.

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 |
| <hr/> | | | |
| 2.0 | _____ | Notify TB Operator to ensure open all breakers on:

_____ 480V Rx Aux Bus 3A
_____ PZR Htr MCC-3A | |
| <hr/> | | | |
| 3.0 | _____ | Place IAP-1A c/s in Pull-to-Lock. | |
| <hr/> | | | |
| 4.0 | _____ | Energize 480V Rx Aux Bus 3A. | Close the following breakers:
o Bkr 3321
o Bkr 3395 |
| <hr/> | | | |
| 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 3392, Turb Aux 3A Tie
- o Bkr 3391, 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
1. 0V 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
 - OR
 - o Unit 3A, PZR Htr Grp
 - OR
 - o Unit 4A, PZR Htr Grp
 - 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
416CV ES B

- 9.0 — IF DPBC-1C Battery recharge is required,
Place DPBA-1C on charge.
1. — Ensure LWDG-1B capacity is available for 160 KW, see Table 1 for rating.
 - 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