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INADEQUATE SUBCOOLING MARGIN

1.0 ENTRY CONDITIONS

IF in MODES 3 OR 4,

AND either of the following conditions exist:

- o Tsat Monitor indicates inadequate subcooling margin,
- o SPDS indicates inadequate subcooling margin,

THEN use this EOP.

Table 1
Tsat Monitor Adequate Subcooling Margin:

RCS	Margin
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

2.0 IMMEDIATE ACTIONS

ACTIONS | DETAILS

****

CAUTION

Tripping ALL RCPs > 2 minutes after losing Adequate SCM could cause core damage.

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2.1 ___ IF ≤ 2 minutes have elapsed since losing ASCM, THEN trip ALL RCPs.

IF > 2 minutes have elapsed since losing ASCM, THEN leave 1 RCP running in each loop.

RULE #1, LOSS OF SUBCOOLING MARGIN
IF adequate subcooling margin is lost,
THEN perform the following:
1 Trip ALL RCPs immediately...
2 Ensure FULL HPI...
3 Ensure HPI flows are balanced...

RULE #3, EFW CONTROL
1 Ensure EFW flow limits are NOT exceeded...
2 Ensure required OTSG level...
3 IF adequate subcooling margin does NOT exist,
THEN ensure OTSG levels are continuously progressing towards 80 - 90%...
4 EFW flow should be throttled to prevent OTSG PRESS from decreasing > 100 psi below desired setpoint...

RULE #4, PRESSURIZED THERMAL SHOCK
1 The PTS guidelines MUST be implemented when either of the following conditions exist:
- o Forced RCS Flow: T_{cold} < 380°F AND cooldown rate exceeds T.S. limit.
- o NO Forced RCS Flow: RCPs OFF AND HPI flow exists.

2 PTS guidelines: Ensure minimum adequate subcooling margin is maintained...

Table 1
Tsat Monitor Adequate Subcooling Margin:

RCS	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

ACTIONS		DETAILS
3.1	___ Notify personnel of plant conditions as required.	___ STA ___ Plant Operators ___ SSOD to evaluate plant conditions for potential entry into the Emergency Plan.
3.2	___ Ensure the following: o Full HPI flow exists. o HPI flow is balanced. [RULE #1, LOSS OF SCM] IF HPI flow can not be established, THEN GO TO step 3.18 in this procedure.	1 ___ BWST suctions to MU open: o MUV-73 o MUV-58 2 ___ 2 MUPs and associated cooling water pumps operating. 3. HPI valves open: ___ MUV-23 ___ MUV-24 ___ MUV-25 ___ MUV-26 4 ___ MUP recirc valves closed: o MUV-53 o MUV-257 5 ___ Close MUV-27 normal MU. 6 ___ HPI flow is balanced.
3.3	___ Ensure OTSG levels are at or trending towards 80 - 90% using EFW. IF EFW is NOT available, THEN use MFW.	o Ensure both EFWPs are running and EFW flow is controlled. [RULE #3, EFW CONTROL] o IF ≥ 500 gpm HPI flow exists, AND an OTSG tube leak exists, THEN only raise level in the unaffected OTSG.

RULE #1, LOSS OF SUBCOOLING MARGIN
IF adequate subcooling margin is lost,
THEN perform the following:
1 Trip ALL RCPs immediately...
2 Ensure FULL HPI...
3 Ensure HPI flows are balanced...

RULE #2, HPI CONTROL
1 Ensure FULL HPI...
2 HPI MUST be throttled to prevent exceeding Pump runout, NDT limit, PTS guidelines...
3 HPI MAY be throttled anytime adequate subcooling exists based on incores.
4 MUP recirc valves MUST be open prior to throttling HPI flow < 200 gpm/pump...
5 HPI Termination Criteria...

RULE #4, PRESSURIZED THERMAL SHOCK
1 The PTS guidelines MUST be implemented when either of the following conditions exist:
- o Forced RCS Flow: T_{cold} < 380°F AND cooldown rate exceeds T.S. limit.
- o NO Forced RCS Flow: RCPs OFF AND HPI flow exists.

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≤ 150 psig	SPDS
≤ 200°F	N/A

3.0 FOLLOW-UP ACTIONS (CONT)

		ACTIONS	DETAILS
3.4	___	IF RCPs were NOT stopped within 2 minutes, THEN ensure 1 RCP/loop remains running. IF a running RCP trips, THEN start the other RCP in that loop.	1 RCP/loop must remain running until: o ASCM is restored OR o LPI flow ≥ 1000 gpm in each line.

Note:

Rule 4, Pressurized Thermal Shock guidelines are applicable.

3.5	___	IF at any time, Engineered Safeguards systems have or should have actuated, THEN ensure ES status lights are blue for the actuated systems.	o IF RB PRESS ≥ 30 psig and increasing, THEN ensure BSP-1A and BSP-1B are operating with ≈ 1550 gpm flow each. o IF RBIC is actuated, THEN bypass actuation, AND restore RCP seal return and SW cooling to running RCPs. o IF LPI is actuated, THEN bypass actuation, AND control LPI: IF RCS PRESS > 500 psig, THEN stop both LPI pumps. IF RCS PRESS < 500 psig, AND LPI FLOW < 300 gpm, THEN refer to Enclosure 2, LPI Low Flow Control. o IF HPI is actuated, THEN bypass and control HPI. [RULE #1, LOSS OF SUBCOOLING MARGIN] [RULE #2, HPI CONTROL]

Applicable Carry-over steps:
3.5 IF ES has or should have actuated...

RULE #4, PRESSURIZED THERMAL SHOCK

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   - o Forced RCS Flow: T_{cold} < 380°F AND cooldown rate exceeds T.S. limit.
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≤ 150 psig	SPDS
≤ 200°F	N/A

ACTIONS	DETAILS
3.6 ___ IF LPI flow is ≥ 1000 gpm in each injection line, THEN GO TO EOP-08, LOCA Cooldown, beginning with step 3.1.	
3.7 ___ IF RCS leak exists, THEN isolate possible leak paths. 1 Isolate potential leak sources. 2 Observe for indication of leak isolation. 3 Return components to service if they are eliminated as the source of the leak.	o ___ IF PORV is NOT required to be open for HPI/PORV cooling, THEN close RCV-11, PORV block valve. o ___ Close RCV-13, PZR spray block valve. o ___ Ensure DHV-3 is closed. o ___ Close letdown cooler inlet valves: ___ MUV-38 ___ MUV-39 ___ MUV-498
3.8 ___ IF incores indicate ≥ 20°F superheat, THEN GO TO EOP-07, Inadequate Core Cooling, beginning with step 3.1.	Tsat monitor or SPDS indicate ≥ 20°F superheat.
3.9 ___ IF RC TEMP is increasing due to lack of heat transfer, THEN GO TO EOP-04, Inadequate Heat Transfer, beginning with step 3.1.	Any of the following exist: o Loss of EFW AND MFW, o No OTSG available, o Incore temperatures rising.

Applicable Carry-over steps:
3.5 IF ES has or should have actuated...

RULE #4, PRESSURIZED THERMAL SHOCK

1 The PTS guidelines MUST be implemented when either of the following conditions exist:
   - o Forced RCS Flow: T_{cold} < 380°F AND cooldown rate exceeds T.S. limit.
   - o NO Forced RCS Flow: RCPs OFF AND HPI flow exists.

2 PTS guidelines: Ensure minimum adequate subcooling margin is maintained...

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RCS	Margin
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≤ 150 psig	SPDS
≤ 200°F	N/A

ACTIONS	DETAILS
3.10 ___ IF RC TEMP is decreasing due to excessive primary to secondary heat transfer, THEN GO TO EOP-05, Excessive Heat Transfer, beginning with step 3.1.	o Cooldown can NOT be controlled. o OTSG PRESS decrease can NOT be controlled.
3.11 ___ IF OTSG tube leak exists, THEN GO TO EOP-06, Steam Generator Tube Rupture, beginning with step 3.1.	Condenser or MS line radiation monitors have alarmed: Condenser exhaust monitor: RMA-12 MS line monitors: o RMG-25 o RMG-27 o RMG-26 o RMG-28
3.12 ___ IF adequate subcooling margin has NOT been restored, THEN GO TO EOP-08, LOCA Cooldown, beginning with step 3.1.	Refer to Table 1, Adequate Subcooling Margin.
3.13 ___ IF NO OTSG is available for heat transfer, THEN GO TO EOP-08, LOCA Cooldown, beginning with step 3.1.	OTSG heat transfer is available IF all 3 of the following conditions exist, ___ MFW or EFW or AFW available ___ TBVs or ADVs available ___ OTSG integrity exists

Applicable Carry-over steps:
3.5 IF ES has or should have actuated...

RULE #4, PRESSURIZED THERMAL SHOCK

1 The PTS guidelines MUST be implemented when either of the following conditions exist:
   - o Forced RCS Flow: T_{cold} < 380°F AND cooldown rate exceeds T.S. limit.
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2 PTS guidelines: Ensure minimum adequate subcooling margin is maintained...

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≤ 200°F	N/A

Table 2
OTSG Tube to Shell ΔT Limits:

Tensile ΔT Limit: Avg T_{shell} - T_{cold}	≤ 100°F
Compressive ΔT Limit: T_{hot} - Avg T_{shell}	≤ 60°F
"A" OTSG shell Temps: A-730, 731, 732, 733, 734, Avg: R-771 "B" OTSG shell Temps: A-735, 736, 737, 738, 739, Avg: R-772	

ACTIONS	DETAILS

PLANT STATUS:
ADEQUATE SUBCOOLING MARGIN EXISTS
OTSG HEAT TRANSFER EXISTS

NOTE
Starting an RCP could result in a temporary loss of adequate subcooling margin due to collapsing of voids. All RCPs must be secured if ASCM does not recover within 2 minutes.

3.14 ___ IF, at any time while performing this EOP, NO RCPs are running, AND RCPs become available, THEN start at least 1 RCP.

RCPs are available when ALL of the following conditions exist:

___ 6900V Rx Aux Bus is energized

___ ≥ 70°F Subcooling Margin exists

___ All RCP start permissives are met

___ Compressive Tube to Shell ΔT is < 60°F. Refer to Table 2.

RCP starting:

1 ___ Establish PZR level ≥ 200"

2 ___ IF either OTSG is available, THEN start 1 RCP in each loop starting the RCP in the loop with the highest OTSG level first.

IF NO OTSG is available, THEN start 1 RCP.

Applicable Carry-over steps:
3.5 IF ES has or should have actuated... 3.14 Start at least 1 RCP when available...

RULE #4, PRESSURIZED THERMAL SHOCK

1 The PTS guidelines MUST be implemented when either of the following conditions exist:
   - o Forced RCS Flow: T_{cold} < 380°F AND cooldown rate exceeds T.S. limit.
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≤ 200°F	N/A

ACTIONS	DETAILS
3.15 ___ IF this EOP was entered while responding to a reactor trip, THEN GO TO EOP-02, Vital System Status Verification, beginning with step 3.1.	
3.16 ___ IF RCS leak exists, AND leak rate is > 50 gpm, THEN GO TO EOP-08, LOCA Cooldown, at step 3.1.	
3.17 ___ GO TO EOP-10, Post-Trip Stabilization, beginning with step 3.1.	

RULE #3, EFW CONTROL

1 Ensure EFW flow limits are NOT exceeded...

2 Ensure required OTSG level...

3 IF adequate subcooling margin does NOT exist, THEN ensure OTSG levels are continuously progressing towards 80 to 90%...

4 EFW flow should be throttled to prevent OTSG PRESS from decreasing > 100 psi below desired setpoint...

Table 1: Tsat Monitor Adequate Subcooling Margin

RCS	Margin
> 1500 psig	30°F
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≤ 150 psig	SPDS
≤ 200°F	N/A

ACTIONS	DETAILS

Status

- o Inadequate SCM exists
- o No HPI flow is available
- o Efforts to restore HPI flow are in progress.

****

CAUTION

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

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3.18 ___	Ensure OTSGs levels are at or trending towards 80 to 90%.	Establish and maintain OTSG levels using EFW. [Rule 3, EFW Control] IF EFW is NOT available, THEN use MFW.

Note

Steaming with both the TBVs and ADVs will initially result in steam flow exceeding EFW capability, resulting in OTSG level decrease.

3.19 ___	Establish and maintain a cooldown at the maximum rate possible, using both OTSGs.	1 ___ Reduce and maintain OTSG pressure as low as possible. o Open TBVs fully o Open ADVs fully. 2 ___ Maintain cooldown at the maximum rate until HPI is restored or until LPI is injecting $\geq$ 1000 gpm per line.

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible...

Rule 3, EFW Control
1 Ensure EFW flow limits are NOT exceeded...
2 Ensure required OTSG level...
3 IF adequate subcooling margin does NOT exist,
THEN ensure OTSG levels are continuously progressing towards 80 to 90%...
4 EFW flow should be throttled to prevent OTSG PRESS from decreasing > 100 psi below desired setpoint...

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≤ 150 psig	SPDS
≤ 200°F	N/A

ACTIONS	DETAILS
3.20 ___ WHEN either OTSG PRESS is between 725 and 600 psig, THEN bypass EFIC MS and MFW isolation actuations. Continue on in this procedure.	1. Depress "< 725 PSI STM GEN PRESS EFIC ACT BYPASS" pushbuttons: ___ "CHANNEL A" ___ "CHANNEL B" ___ "CHANNEL C" ___ "CHANNEL D". 2 ___ Depress both "EFIC CHAN TO EFP START LOGIC" "MANUAL PERMISSIVE" pushbuttons to ensure EFW flow is not interrupted as OTSG PRESS decreases < 600 psig: o EFIC channel A "MANUAL PERMISSIVE" o EFIC channel B "MANUAL PERMISSIVE".

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.20 Bypass EFIC MSLI and MFLI at 725 to 600 psig OTSG PRESS...

Rule 3, EFW Control

1 Ensure EFW flow limits are NOT exceeded...

2 Ensure required OTSG level...

3 IF adequate subcooling margin does NOT exist,
THEN ensure OTSG levels are continuously progressing towards 80 to 90%...

4 EFW flow should be throttled to prevent OTSG PRESS from decreasing > 100 psi below desired setpoint...

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Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.20 Bypass EFIC MSLI and MFLI at 725 to 600 psig OTSG PRESS...

Rule 3, EFW Control

1 Ensure EFW flow limits are NOT exceeded...

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≤ 150 psig	SPDS
≤ 200°F	N/A

ACTIONS	DETAILS

Note

Nat Circ may become intermittent as RC voids increase. During these periods of no Nat Circ flow, RC PRESS may increase and require manual PORV operation.

3.21 ___ IF at any time while performing this procedure section, RC PRESS is ≥ 2400 psig, THEN reduce RC PRESS based on OTSG PRESS.

1 ___ Determine OTSG PRESS and corresponding RC PRESS to close PORV.

PORV operation based on OTSG PRESS

OTSG PRESS	RC PRESS to close PORV
1000 psig	1475 psig
950 psig	1425 psig
900 psig	1350 psig
850 psig	1275 psig
800 psig	1200 psig
750 psig	1150 psig
700 psig	1125 psig
≤ 650 psig	1000 psig

2 ___ Open the PORV and leave it open until RC PRESS decreases to the PRESS corresponding to the OTSG PRESS.

3 ___ Close the PORV.

IF the PORV fails to close, THEN close RCV-11 PORV block.

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.20 Bypass EFIC MSLI and MFLI at 725 to 600 psig OTSG PRESS... 3.21 Control RC PRESS < 2400 psig using PORV...

Rule 3, EFW Control
1 Ensure EFW flow limits are NOT exceeded...
2 Ensure required OTSG level...
3 IF adequate subcooling margin does NOT exist,
THEN ensure OTSG levels are continuously progressing towards 80 to 90%...
4 EFW flow should be throttled to prevent OTSG PRESS from decreasing > 100 psi below desired setpoint...

Note

Steaming with both the TBVs and ADVs will initially result in steam flow exceeding EFW capability, resulting in OTSG level decrease.

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≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

ACTIONS	DETAILS
3.22 ___ IF RCPs are not available for bumping, THEN GO TO step 3.27 in this procedure.	RCPs are available for bumping if both of the following conditions exist: o RCP power is available, o All RCP start permissives except for seal injection are met.
3.23 ___ IF Nat Circ heat transfer exists in both RC loops, THEN GO TO step 3.27 in this procedure.	Indication of Nat Circ in both RC loops: ___ T_{cold} coupled with and tracking T_{sat} for both OTSGs ___ ΔT (T_{incore} - T_{cold}) develops and stabilizes ___ T_{incore} within 10°F of T_{hot}
3.24 ___ IF at any time while HPI is unavailable, Nat Circ is lost in any RC loop, THEN bump 1 RCP.	1 ___ Bypass RCP start permissives to allow bump without seal injection flow. 2 ___ Ensure RCV-10 PORV is closed 3 ___ Bump RCP in loop with highest OTSG level first.
3.25 ___ IF Nat Circ heat transfer exists in both RC loops 10 to 15 minutes after RCP bumping, THEN GO TO step 3.27 in this procedure.	Indication of Nat Circ in both RC loops: ___ T_{cold} coupled with and tracking T_{sat} for both OTSGs ___ ΔT (T_{incore} - T_{cold}) develops and stabilizes ___ T_{incore} within 10°F of T_{hot}

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.20 Bypass EFIC MSLI and MFLI at 725 to 600 psig OTSG PRESS... 3.21 Control RC PRESS < 2400 psig using PORV... 3.24 IF Nat Circ is lost in any RC loop, THEN bump available RCPs...

Rule 3, EFW Control
1 Ensure EFW flow limits are NOT exceeded...
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3 IF adequate subcooling margin does NOT exist,
THEN ensure OTSG levels are continuously progressing towards
80 to 90%...
4 EFW flow should be throttled to prevent OTSG PRESS from decreasing
> 100 psi below desired setpoint...

Note

Steaming with both the TBVs and ADVs will initially result in steam flow exceeding EFW capability, resulting in OTSG level decrease.

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

ACTIONS		DETAILS
3.26	___ Bump available RCPs one at a time, allowing 10 to 15 minutes between bumps.	Repeat steps 3.23, 3.24, and 3.25 for the available RCPs until any of the following conditions exist: o Nat Circ heat transfer exists o HPI flow is restored o LPI is flowing into the core ___ RCP-1A ___ RCP-1B ___ RCP-1C ___ RCP-1D

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.20 Bypass EFIC MSLI and MFLI at 725 to 600 psig OTSG PRESS... 3.21 Control RC PRESS < 2400 psig using PORV... 3.24 IF Nat Circ is lost in any RC loop, THEN bump available RCPs...

Rule 2, HPI Control
1 Ensure FULL HPI...
2 HPI must be throttled to prevent exceeding pump runout, NDT limit, PTS guidelines...
3 HPI may be throttled anytime adequate SCM exists based on T_{incore}.
4 MUP recirc valves must be open prior to throttling HPI flow < 200 gpm/pump...
5 HPI termination criteria...

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≤ 200°F	N/A

Table 3: Cooldown Rate Limits

RCP Status	RCS Temp	Cooldown Limit
≥ 1 RCP Running	> 280°F	≤ 50°F ½ hr
	280 to 150°F	≤ 25°F ½ hr
No RCPs Running	RC Press maintained above Nat Circ Curve of Figure 1	≤ 25°F ½ hr
	> 280°F	≤ 5°F ½ hr
	280 to 150°F	≤ 2.5°F ½ hr

ACTIONS	DETAILS
3.27 ___ Ensure CFT isolation valves are open.	To open CFT isolation valves: 1 ___ Notify available PPO to unlock and close Bkrs for CFT isolation valves at ES MCC 3AB: o CFV-5 unit 6B o CFV-6 unit 6C. 2 ___ Open CFT isolation valves: o CFV-5 o CFV-6.
3.28 ___ Energize all HPVs.	Notify available PPO to energize the HPVs by closing the following switches: ___ DPDP-8A switch 13 ___ DPDP-5A switch 1 ___ DPDP-5B switch 1
3.29 ___ Continuous efforts should be made to establish HPI flow.	___ Nuclear Shift Manager ___ Emergency Repair Team ___ Accident Assessment
3.30 ___ WHEN HPI has been established, THEN use TBVs and ADVs to reduce cooldown rate ≤ ITS limits and GO TO step 3.1 in this procedure. Continue on in this procedure.	o Control cooldown rate using TBVs or ADVs. o Do not throttle HPI until adequate SCM has been restored. [Rule 2, HPI Control] See Table 3: Cooldown Rate Limits.

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.24 IF Nat Circ is lost in any RC loop, THEN bump available RCPs... 3.29 Continuous efforts should be made to establish HPI flow... 3.30 WHEN HPI has been established, THEN control cooldown rate using TBVs and ADVs...

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≥ 1 RCP Running	> 280°F	≤ 50°F ½ hr
	280 to 150°F	≤ 25°F ½ hr
No RCPs Running	RC Press maintained above Nat Circ Curve of Figure 1	≤ 25°F ½ hr
	> 280°F	≤ 5°F ½ hr
	280 to 150°F	≤ 2.5°F ½ hr

ACTIONS		DETAILS
3.31	___ WHEN RC pressure < 600 psig, THEN observe CFT discharge.	___ CFT levels lowering ___ CFT level alarm annunciates ___ CFT PRESS lowers with RC PRESS
3.32	___ Maintain maximum possible cooldown rate until HPI is restored or until LPI flow is ≥ 1000 gpm per line.	Maintain: ___ ADVs and TBVs full open ___ OTSGs feeding for 80 to 90% level ___ Nat Circ in both RC loops

Applicable Carry-over steps:
3.24 IF Nat Circ is lost in any RC loop, THEN bump available RCPs... 3.29 Continuous efforts should be made to establish HPI flow... 3.30 WHEN HPI has been established, THEN control cooldown rate using TBVs and ADVs... 3.32 Maintain maximum possible cooldown until HPI or LPI flow exists

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RCP Status	RCS Temp	Cooldown Limit
≥ 1 RCP Running	> 280°F	≤ 50°F ½ hr
	280 to 150°F	≤ 25°F ½ hr
No RCPs Running	RC Press maintained above Nat Circ Curve of Figure 1	≤ 25°F ½ hr
	> 280°F	≤ 5°F ½ hr
	280 to 150°F	≤ 2.5°F ½ hr

ACTIONS	DETAILS
3.33 ___ WHEN ES LPI actuation occurs, THEN bypass actuation and ensure LPI operation.	1 ___ Ensure LPI suction valves from BWST are open: o DHV-34 o DHV-35. 2 ___ Ensure LPI injection valves are open: o DHV-5 o DHV-6. 3. Ensure LPI train pumps are operating: LPI train pumps ___ DCP-1A ___ DCP-1B ___ RWP-3A ___ RWP-3B ___ DHP-1A ___ DHP-1B 4 ___ Ensure LPI flow control valves open to control at 3000 gpm: o DHV-110 o DHV-111.

Applicable Carry-over steps:
3.19 Establish and maintain maximum cooldown rate possible... 3.29 Continuous efforts should be made to establish HPI flow... 3.30 WHEN HPI has been established, THEN control cooldown rate using TBVs and ADVs... 3.32 Maintain maximum possible cooldown until HPI or LPI flow exists

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≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

Table 3: Cooldown Rate Limits

RCP Status	PCS Temp	Cooldown Limit
≥ 1 RCP Running	> 280°F	≤ 50°F ½ hr
	280 to 150°F	≤ 25°F ½ hr
No RCPs Running	RC Press maintained above Nat Circ Curve of Figure 1	≤ 25°F ½ hr
	> 280°F	≤ 5°F ½ hr
	280 to 150°F	≤ 2.5°F ½ hr

ACTIONS	DETAILS
3.34 ___ IF LPI flow is < 300 gpm per pump, THEN Open the PORV and HPVs as required to increase LPI flow to ≥ 300 gpm per pump.	Increase LPI flow to ≥ 300 gpm per pump. 1 ___ Open RCV-10 PORV. 2 ___ IF LPI flow is < 300 gpm per pump, THEN energize and open all HPVs. HPVs

PZR	A hot leg	B hot leg
___RCV-159	___RCV-157	___RCV-163
___RCV-160	___RCV-158	___RCV-164

3.35 ___ WHEN LPI flow has been established, THEN GO TO EOP-08, LOCA Cooldown, beginning with step 3.1.	Continue efforts to establish HPI flow until LPI flow is ≥ 1000 gpm for 20 min.

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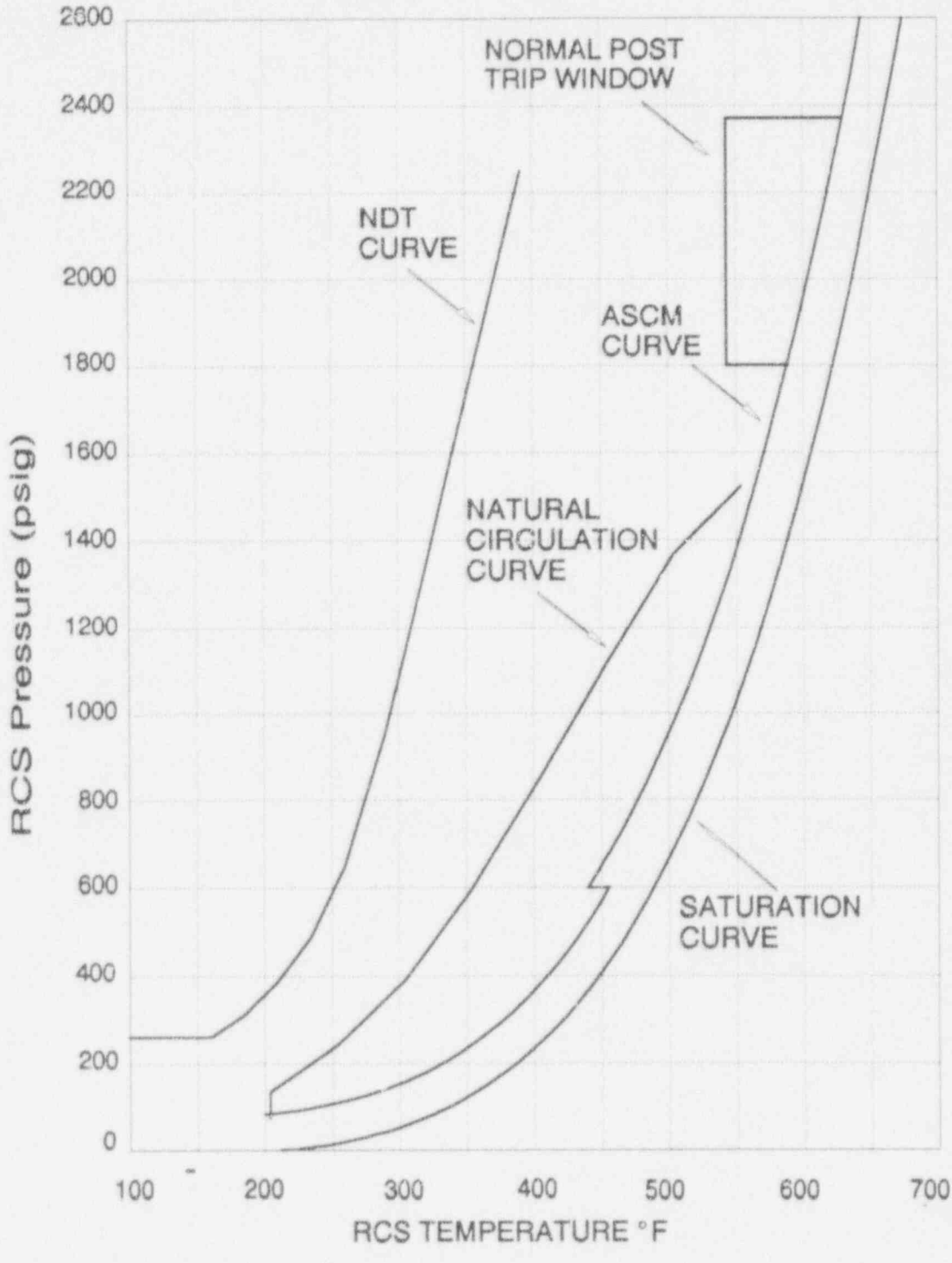
Figure 1

Cooldown Curve for Natural Circulation and Forced Flow



Acceptable region is:

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