

PLANT OPERATIONS MANUAL

Volume 5

05-S-01-EP-8

Section 1

Revision C

Date:

EMERGENCY PROCEDURE
ALTERNATE SHUTDOWN COOLING
SAFETY RELATED

Prepared: _____ Date _____
Reviewed: _____ Date _____
 Technical Review
Reviewed: _____ Date _____
 Operations Superintendent
Reviewed: _____ Date _____
 Nuclear Plant Quality Superintendent
Approved: _____ Date _____
 Assistant Plant Manager
PSRC: _____ Date _____

List of Effective Pages:

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1.0 PURPOSE

The purpose of this procedure is to establish an alternate means for cooling down the RPV when the RHR Shutdown Cooling Mode is not available.

2.0 ENTRY CONDITIONS

This procedure is entered from EP-2 (Cooldown) when the following occur concurrently:

2.1 RHR Shutdown Cooling Mode cannot be established

and

2.2 The RPV can no longer be cooled down by depressurization

and

2.3 RPV temperature must be reduced and/or the RPV must be maintained in a cold shutdown condition.

3.0 OPERATOR ACTIONS

☐ 3.1 Initiate Suppression Pool Cooling (04-1-01-E12-1 step later)

☐ 3.2 Close the following if open:

☐ 3.2.1 RPV head vents B21-F001
 B21-F002
 B21-F005

☐ 3.2.2 MSIV's

☐ 3.2.3 Main Steam Line Drains

☐ 3.3 Open or shut SRV's as necessary such that one SRV is open.

☐ 3.4 Inject into the RPV with one of the following pumps taking a suction from the Suppression Pool

☐ 3.4.1 LPCI (04-1-01-E12-1 step later)

☐ 3.4.2 LPCS (04-1-01-E21-1 step later)

☐ 3.5 Slowly increase RPV water level to between
flow through the open SRV back to the Suppression pool.

☐ 3.5.1 Verify flow through the SRV by ensuring SRV tailpipe temperature equalizes with RPV temperature.

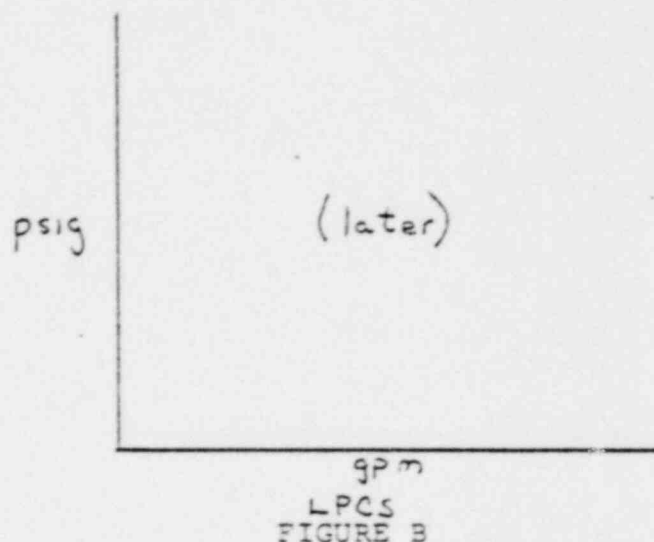
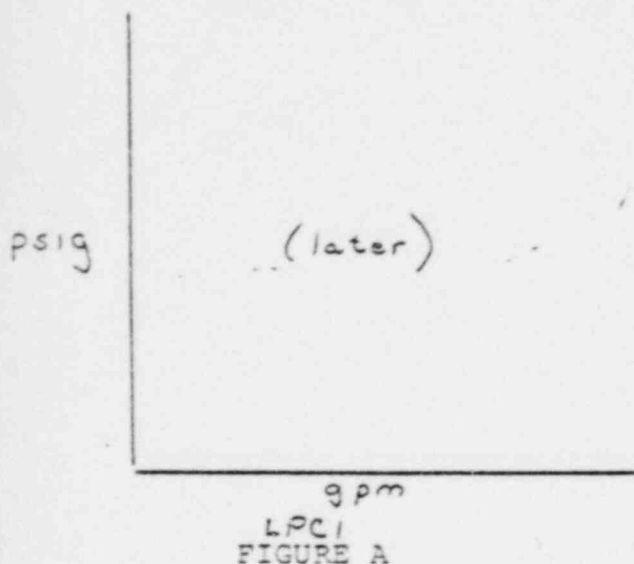
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- ☐ 3.5.2 If no flow is indicated through the SRV, open another SRV.
- ☐ 3.6 Slowly increase the running pump flow to the maximum allowable for the stable RPV pressure (LPCI-Figure A or LPCI - Figure B)



- ☐ 3.6.1 If RPV pressure does not stabilize above (Later) psig, start another LPCS or LPCI pump.
- ☐ 3.6.2 If RPV pressure does not stabilize below (Later) psig, open another SRV.
- ☐ 3.7 Monitor Suppression Pool level

NOTE

A steady SRV tailpipe temperature with a varying RPV temperature accompanied by a decreasing Suppression Pool level is indicative of an SRV line break in the Drywell.

- ☐ 3.7.1 If Suppression Pool level is constant, alternate Shutdown Cooling has been established.
- ☐ 3.7.2 If Suppression Pool level is decreasing
- a. Verify proper flow through the SRV by ensuring SRV tailpipe temperature equals RPV temperature
 - (1) If temperatures are not equal, open another SRV
 - b. Verify the operating injection system (LPCS and/or LPCI) is lined up properly for injection into the vessel.
- ☐ 3.8 If the cooldown rate exceeds 100°F/hr, reduce LPCS and LPCI injection flowrate into the RPV until the cooldown rate decreases to less than 100°F/hr.

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- ☐ 3.9 Control Suppression Pool temperature to maintain RPV water temperature above 70°F (04-1-01-E12-1 step later).
- ☐ 3.10 Proceed to cold shutdown in accordance with IOI-03-1-01-3.

ENTRY CONDITIONS:

AND
AND
AND

EAR SHUTDOWN COOLING
CANNOT BE ESTABLISHED

RPV CANNOT BE COOLED
DOWN BY DEPRESSURIZATION

RPV TEMP CANNOT BE REDUCED
AND / OR RPV MUST BE MAIN-
TAINED IN COLD SHUTDOWN
CONDITION

ALTERNATE
SHUTDOWN
COOLING
(EP-8)

INITIATE SUPPRESSION
POOL COOLING

CLOSE, IF OPEN:
• RPV HEAD VENTS
• MSIV's
• MAIN STN LINE DRAINS

PLACE ONE SRV CONTROL
SWITCH TO OPEN

SLOWLY RAISE RPV WATER
LEVEL, ESTABLISH FLOW
THROUGH SRV TO SUPPRESS.
POOL

START ONE LPS OR LPCI
PUMP TAKING SUCTION
FROM SUPPRESS. POOL

SLOWLY INCREASE LPS-
OR LPCI FLOW TO MAXIMUM

START ANOTHER
LPS OR LPCI PUMP

OPEN
ANOTHER SRV

← CONCURRENTLY →

NO
RPV
PRES. STABLE
* $\geq$ 800
YES

* PROVIDED LATER

NO
RPV
PRES. STABLE
* $\geq$ 800
YES

CONTROL SUPPRESS POOL TEMP TO
MAINTAIN RPV TEMP $> 90^{\circ}\text{F}$

PROCEED TO COLD SHUTDOWN
DOI $\neq$

NO
COOLDOWN
RATE $> 100^{\circ}\text{F}/\text{HR}$
YES
REDUCE LPS OR LPCI
FLOW RATE TO REDUCE
RPV COOLDOWN RATE
TO $< 100^{\circ}\text{F}/\text{HR}$