

Submitted: _____
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SP Number 29.023.04
Revision C
Effective Date _____

LEVEL RESTORATION
EMERGENCY PROCEDURE

DRAFT

1.0 PURPOSE

The purpose of this procedure is to restore RPV water level to above top of active fuel.

2.0 ENTRY CONDITIONS

Enter this procedure from 29.023.01 (Level Control) or 29.023.02 (Cooldown) when RPV water level cannot be maintained above top of active fuel (TAF).

NOTE

TAF = +6" as read on fuel zone instrumentation:

3.0 OPERATOR ACTIONS

3.1 Lineup for injection and start pumps in two or more of the following normal injection subsystems:

3.1.1 Condensate

3.1.2 CS A

3.1.3 CS B

3.1.4 LPCI A

3.1.5 LPCI B

3.2 If less than two normal injection subsystems (Paragraph 3.1) can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

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A PDR

- 3.2.1 Service water/recirc loop ultimate cooling water cross-ties valves 1P41-MOV-033A, MOV-033B, MOV-033C, and MOV-033D.
- 3.2.2 ECCS connections from the Condensate Transfer System
- 3.2.3 SLC (test tank) per SP 23.123.01, Standby Liquid Control
- 3.2.4 SLC (boron tank) per SP 23.123.01, Standby Liquid Control

CAUTION

IF RPV water level cannot be determined and at least one subsystem with at least one pump running is:

1. lined up for injection - proceed to 29.023.05 (Rapid RPV Depressurization)
2. not lined up for injection - proceed to Step 3.7.4, (Core Cooling Without Injection).

3.3 Monitor RPV pressure and water level

- 3.3.1 Continue in this procedure at the step indicated in the following table:

NOTE

If at any time the RPV water level trend reverses or RPV pressure changes region, return to step 3.3.1.

Table 1

RPV PRESSURE REGION			
	333 HIGH	333 to 100 INTERMEDIATE	100 LOW
RPV LVL INC.	3.4	3.5	3.6
RPV LVL DEC.	3.7		3.8

3.4 RPV level increasing and RPV pressure greater than 333 psig (High Region).

- 3.4.1 ENTER SP29.023.01, Level Control at Step 3.3.

3.5 RPV level increasing and RPV pressure between 333 and 100 psig (intermediate region).

CAUTION

Do not depressurize the RPV below 100 psig unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.

- 3.5.1 If HPCI and RCIC are available and RPV water level increases to +12.5", proceed to SP29.023.01 (Level Control) Step 3.3.
- 3.5.2 If HPCI and RCIC are not available and RPV pressure is increasing, proceed to SP29.023.05 (Rapid RPV Depressurization).
- 3.5.3 If HPCI and RCIC are not available and RPV pressure is not increasing, proceed to SP29.023.01 (Level Control) step 3.3.

3.6 RPV level increasing and RPV pressure 100 psig (low region).

- 3.6.1 Determine RPV pressure.
- 3.6.2 If RPV pressure is increasing, proceed to SP29.023.05 (Rapid RPV Depressurization).
- 3.6.3 If RPV pressure is not increasing, proceed to SP29.023.01, (Level Control) step 3.3.

3.7 RPV level decreasing and RPV pressure greater than 333 psig (Intermediate/High region).

- 3.7.1 If HPCI and RCIC are not operating, restart HPCI per SP 23.202.01, High Pressure Coolant Injection and/or RCIC per SP 23.119.01, Reactor Core Isolation Cooling (RCIC) System.
- 3.7.2 If CRD is not operating but at least 2 injection subsystems are lined up for injection with pumps running, proceed to SP29.023.05 (Rapid RPV Depressurization).
- 3.7.3 If CRD is not operating and no normal injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.
- 3.7.4 When RPV water level drops to +6" on the fuel zone instrumentation (TAF), perform the following.

3.7.4.1 If CRD is not operating and no normal injection or alternate injection subsystem is lined up for injection with at least one pump running, perform core cooling without injection as follows.

3.7.4.1.1 When RPV water level drops to later (2/3 core height) or if RPV water level cannot be determined, open one SRV.

3.7.4.1.2 As RPV pressure decreases, open additional SRV's as required by the following table.

<u>RPV PRESSURE (psig)</u>	<u>TOTAL NUMBER OF SRV's OPEN</u>
above 800	1
between 800 and 500	2
between 500 and 350	3
between 350 and 250	4
between 250 and 175	5
between 175 and 125	6
below 125	7

3.7.4.1.3 When a normal injection or alternate injection subsystem is lined up for injection with at least one pump running, proceed to SP 29.023.05 (Rapid RPV Depressurization).

3.7.4.2 If the RPV water level drops to +6" on the fuel zone indicator (TA^W) and CRD is operating or a normal injection system is lined up for injection with a pump running or an alternate injection system is lined up for injection with pump running proceed to SP29.023.05 (Rapid RPV Depressurization).

3.8 RPV level decreasing and RPV pressure less than 100 psig (low region).

3.8.1 If no normal injection system is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection and perform the following.

3.8.1.1 If RPV pressure is increasing, proceed to SP29.023.05 (Rapid RPV Depressurization).

3.8.1.2 If RPV pressure is not increasing and RPV water level drops to +6" on fuel zone instrumentation (TAF), perform Core Cooling Without Level Restoration as follows.

3.8.1.2.1 Open all ADS valves.

CAUTION

Observe NPSH requirements for the core spray pumps as indicated, when taking a suction on the Suppression Pool.

PUMPS	SUPPRESSION POOL	
	MAXIMUM TEMPERATURE	MINIMUM LEVEL
CS	Later	Later

NOTE

Cooldown rates greater than 100°F/Hr may be required to accomplish this step.

3.8.1.2.2 If all of the ADS valves cannot be opened, open other SRV's until 7 valves are open.

3.8.1.2.3 Operate Core Spray subsystems with suction from the Suppression pool.

3.8.1.2.4 When at least one core spray subsystem is operating with suction from the Suppression Pool and RPV pressure is less than 290 psig, terminate injection into the RPV from sources external to the primary containment.

3.8.1.2.5 If RPV water level is restored to +6" (TAF) on the fuel zone instrumentation, proceed to SP 29.023.01 (Level Control) at paragraph 3.3.

4.0 REFERENCES

- 4.1 SP 29.023.05 Rapid RPV Depressurization
- 4.2 SP 29.023.01 Level Control
- 4.3 SP 23.202.01 High Pressure Coolant Injection
- 4.4 SP 23.119.01 Reactor Core Isolation Cooling (RCIC) System
- 4.5 SP 23.106.01 Control Rod Drive
- 4.6 SP 29.023.09 RPV Flooding
- 4.7 SP 23.203.01 Core Spray System
- 4.8 SP 23.123.01 Standby Liquid Control
- 4.9 SP 23.204.01 Low Pressure Coolant Injection
- 4.10 SP 23.103.01 Condensate System
- 4.11 SP 23.105.01 Condensate Storage and Transfer System
- 4.12 SP 23.109.01 Feedwater System