FOR INFORMATION ONLY

EOP-2 RPV CONTROL

ENTRY CONDITIONS			
RPV pressure above 1080 psig	RPV water level below 177 in.	Reactor power above 2.5% or unknown when a scram is required	Drywell pressure above 2.7 psig

While executing this procedure:	
IF	THEN
PRIMARY CONTAINMENT FLOODING IS OR HAS BEEN REQUIRED	Exit the EOPs and enter the SAOGs.

Has a scram been initiated? — No → Scram the reactor. — Yes ↓

Are all control rods inserted to or beyond position 02? — No/Unknown → Will the reactor remain shutdown under all conditions without boron? — No/Unknown → Exit this procedure and enter EOP-3, "Failure to Scram." — Yes ↓

Section RPV/P

Monitor and control **RPV PRESSURE**

IF	THEN
A high drywell pressure ECCS initiation signal exists (2.7 psig)	Prevent injection from those CS and RHR pumps not required to assure adequate core cooling before depressurizing below their maximum injection pressures (EP-5).
Emergency RPV depressurization is anticipated	Irrespective of the resulting RPV cooldown rate, rapidly depressurize the RPV with the main turbine bypass valves.
EMERGENCY RPV DEPRESSURIZATION IS OR HAS BEEN REQUIRED	Exit "Section RPV/P" of this procedure and enter "Emergency RPV Depressurization."
STEAM COOLING IS REQUIRED	Exit "Section RPV/P" of this procedure and enter "Steam Cooling."
Torus temperature cannot be maintained below the Heat Capacity Temperature Limit	Irrespective of the resulting RPV cooldown rate, maintain RPV pressure below the Heat Capacity Temperature Limit.
Torus water level cannot be maintained below the SRV Tail Pipe Level Limit	Irrespective of the resulting RPV cooldown rate, maintain RPV pressure below the SRV Tail Pipe Level Limit.
RPV water level cannot be determined	Exit this procedure and enter EOP-7, "RPV Flooding" at "Shutdown Flooding."
The reactor is not shutdown	Exit this procedure and enter EOP-3, "Failure to Scram."

Stabilize RPV pressure below 1080 psig with the main turbine bypass valves.
Augment RPV pressure control as required with one or more Group 1 Pressure Control Systems.

IF	THEN
RPV pressure cannot be stabilized below 1080 psig using the main turbine bypass valves and Group 1 Pressure Control Systems	Augment RPV pressure control by using the steam condensing mode of RHR (OP-13G).

Depressurize the RPV. Maintain the RPV cooldown rate less than 100°F/hr.

IF	THEN
SRVs are being used to depressurize the RPV **AND** The continuous SRV pneumatic supply is or becomes unavailable	Depressurize with sustained SRV opening.

WAIT until the shutdown cooling RPV pressure interlock clears.

Cool down to cold shutdown conditions using shutdown cooling. Use only those RHR pumps not required to maintain RPV water level above 177 in. by operation in the LPCI mode. Maintain the RPV cooldown rate less than 100°F/hr.

IF	THEN
Shutdown cooling cannot be established	Maintain RPV pressure below the shutdown cooling RPV pressure interlock using one or more of the systems used for depressurization.

Group 1 Pressure Control Systems

Assigned Pressure Control Band:

- SRVs
  - ❑ Only if torus water level is above 5.5 ft.
  - ❑ If possible, open SRVs in the following sequence: 02RV-71A, J, K, G, E, D, C, F, H, L, B
  - ❑ If the continuous SRV pneumatic supply is or becomes unavailable, place the control switch for each SRV in CLOSE / AUTO.
- HPCI
  - ❑ Align suction to the CST, if available.
- RCIC
  - ❑ Align suction to the CST, if available.
- RWCU, recirc mode
  - ❑ Bypass the filter/demineralizers.
  - ❑ Defeat SLC and other RWCU isolation interlocks if necessary (EP-2).
- RWCU, blowdown mode
- Main steam line drains
- Reactor feed pumps
- SJAEs
- Steam Reboiler

Section RPV/L

Monitor and control **RPV WATER LEVEL** ❶

Verify initiation of each of the following:
- Isolation
- ECCS
- Emergency Diesel Generators

IF	THEN
Primary containment water level and torus pressure cannot be maintained below the Primary Containment Pressure Limit **AND** Adequate core cooling can be assured	Terminate injection into the RPV from sources external to the primary containment.
RPV water level cannot be determined	Exit this procedure and enter EOP-7, "RPV Flooding" at "Shutdown Flooding."

Restore and maintain RPV water level between 177 in. and 222.5 in. using one or more Group 1 Water Level Control Systems.

IF	THEN
RPV water level cannot be restored and maintained above 177 in.	Maintain RPV water level above 0 in. (TAF). One or more Group 2 Water Level Control Systems may be used to augment RPV water level control.
The ADS timer initiates	Override ADS.
RPV water level cannot be restored and maintained above 0 in. (TAF)	Exit "Section RPV/L" of this procedure and enter "Alternate RPV Level Control."

Group 1 Water Level Control Systems

Assigned Water Level Band:

- Condensate / Feedwater
- CRD
- HPCI
  - ❑ Align suction to the CST, if available.
  - ❑ Defeat the high area temperature isolation and high torus water level suction transfer if necessary (EP-2).
- RCIC
  - ❑ Align suction to the CST, if available.
  - ❑ Defeat the low RPV pressure and high area temperature isolations if necessary (EP-2).
- LPCI
  - ❑ Inject through the heat exchangers as soon as possible.
- CS

Group 2 Water Level Control Systems

Assigned Water Level Band:

- RHR Service Water crosstie
- Fire Water crosstie
- RHR Keep-Full
- CS Keep-Full
- Condensate Transfer
- SLC (test or boron tank)

(EP-8)

Emergency RPV Depressurization

IF	THEN
It is anticipated that primary containment water level will rise above 15 ft	**BEFORE** primary containment water level reaches 15 ft, open the following valves and associated breakers. Defeat isolation interlocks if necessary (EP-2). ➢ 13MOV-15 ➢ 23MOV-15 ➢ 29MOV-74
RPV water level cannot be determined	Exit this procedure and enter EOP-7, "RPV Flooding" at "Shutdown Flooding."
The reactor is not shutdown	Exit this procedure and enter EOP-3, "Failure to Scram."

Is drywell pressure above 2.7 psig? — No ↓ / Yes →

Prevent injection from those RHR and CS pumps not required to assure adequate core cooling (EP-5).

✱ IF ... torus water level is above 5.5 ft, THEN ... open all 7 ADS valves.

Can all 7 ADS valves be opened? — Yes → / No ↓

IF ... torus water level is above 5.5 ft, THEN ... open additional SRVs until a total of 7 SRVs are open.

Are 5 or more SRVs open? — Yes → / No ↓

Is RPV pressure less than 50 psig above torus pressure? — Yes → / No ↓

Irrespective of the resulting RPV cooldown rate and the offsite radioactivity release rate, rapidly depressurize the RPV using Group 2 Pressure Control Systems, defeating isolation interlocks if necessary (EP-2).

WAIT until RPV pressure is less than 50 psig above torus pressure.

Maintain RPV pressure less than 50 psig above torus pressure using one or more of the systems used for depressurization.

IF	THEN
Less than 5 SRVs are open and RPV pressure is at least 50 psig above torus pressure	Rapidly depressurize the RPV, return to ✱.

WAIT until the shutdown cooling RPV pressure interlock clears.

Cool down to cold shutdown conditions using shutdown cooling. Use only those RHR pumps not required to maintain RPV water level above 177 in. by operation in the LPCI mode.

IF	THEN
Shutdown cooling cannot be established **AND** Further RPV cooldown is required	Continue to cool down using one or more systems used for depressurization, defeating isolation interlocks if necessary (EP-2).

Group 2 Pressure Control Systems

- SRVs from Unit 1 (02ADS-71) (EP-11)
  - ❑ Only if torus water level is above 5.5 ft.
- Main Condenser (EP-9)
- Main steam line drains
- Reactor feed pumps
- SJAEs
- Steam reboiler
- HPCI steam line
- RCIC steam line
- RWCU, recirc mode
  - ❑ Bypass the filter/demineralizers.
- RWCU, blowdown mode
- Head vent
- RHR (steam condensing mode, OP-13G)
- RHR, (shutdown cooling mode)
  - ❑ Use only those RHR pumps not required to maintain RPV water level above 177 in. by operation in the LPCI mode.

Alternate RPV Level Control

IF	THEN
Primary containment water level and torus pressure cannot be maintained below the Primary Containment Pressure Limit **AND** Adequate core cooling can be assured	Terminate injection into the RPV from sources external to the primary containment.
RPV water level cannot be determined	Exit this procedure and enter EOP-7, "RPV Flooding" at "Shutdown Flooding."
RPV water level is rising	Exit "Alternate RPV Level Control" and enter "Section RPV/L."

Override ADS.

Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, maximize injection into the RPV from Group 1 Water Level Control Systems. RPV injection may be augmented by Group 2 Water Level Control Systems.

IF	THEN
Less than 2 of the following Group 1 water level control subsystems can be lined up: ➢ Condensate ➢ LPCI-A ➢ LPCI-B ➢ CS-A ➢ CS-B	Commence preparing as many Group 2 Water Level Control Systems as possible for injection.

WAIT until RPV water level drops to 0 in. (TAF).

IF	THEN
No Condensate, LPCI or CS pumps are running and lined up for injection into the RPV	Line up for injection, start pumps and raise Group 2 Water Level Control System injection flows to the maximum rates.
RPV water level cannot be maintained above -19 in. without Emergency RPV Depressurization **AND** Pumps capable of restoring and maintaining RPV water level above -19 in. following Emergency RPV Depressurization are running and lined up for injection	**BEFORE** RPV water level drops to -19 in., **EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.**

WAIT until RPV water level drops to -19 in.

Is any RPV injection source lined up with at least one pump running? — No → **STEAM COOLING IS REQUIRED.** → **WAIT** until Emergency RPV Depressurization is Required. — Yes ↓

Can RPV water level be restored and maintained above -19 in.? — No → **EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.** — Yes ↓

Line up for injection, start pumps and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with all available RPV injection systems (Group 1 and Group 2 Water Level Control Systems).

IF	THEN
RPV water level cannot be restored and maintained above -19 in.	PRIMARY CONTAINMENT FLOODING IS REQUIRED.

Steam Cooling

IF	THEN
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED	Exit "Steam Cooling" and enter "Emergency RPV Depressurization."
RPV water level is rising	Exit "Steam Cooling" and enter "Section RPV/P."
Any RPV injection source is lined up with at least one pump running **AND** RPV water level cannot be restored and maintained above -19 in.	**EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.**
The reactor is not shutdown	Exit this procedure and enter EOP-3, "Failure to Scram."
One or more SRVs are being used to stabilize RPV pressure and the continuous SRV pneumatic supply is or becomes unavailable	**EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.**
RPV water level cannot be determined	Exit this procedure and enter EOP-7, "RPV Flooding" at "Shutdown Flooding."

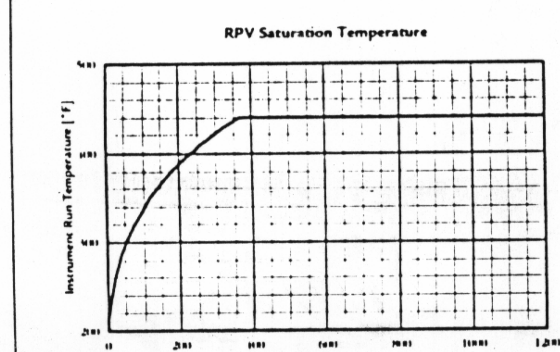
Establish a stable or lowering RPV pressure trend using the following systems:
- SRVs
  - ❑ Only if torus water level is above 5.5 ft.
  - ❑ If possible, open SRVs in the following sequence: 02RV-71A, J, K, G, E, D, C, F, H, L, B
- HPCI
  - ❑ Align suction to the CST, if available. Defeat interlocks if necessary (EP-2).
- RCIC
  - ❑ Align suction to the CST, if available. Defeat interlocks if necessary (EP-2).
- RWCU, recirc mode
  - ❑ Bypass the filter/demineralizers. If necessary, defeat SLC and other RWCU isolation interlocks (EP-2).

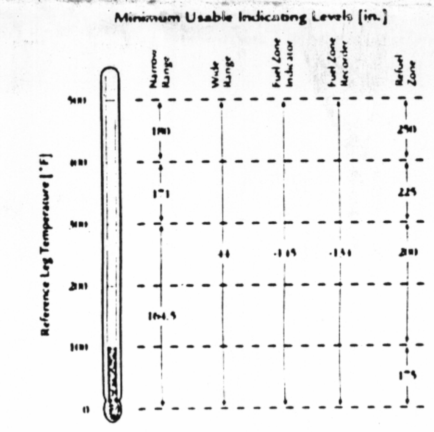
IF	THEN
RPV pressure cannot be stabilized and is rising	**EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.**

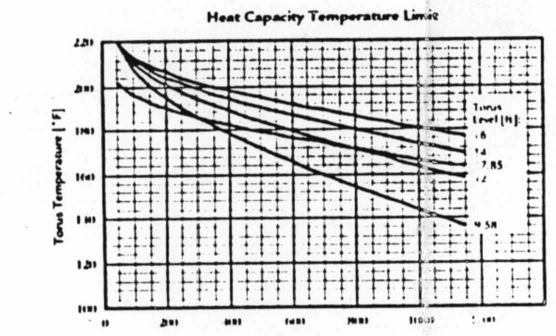
WAIT until RPV water level drops to -31.5 in.

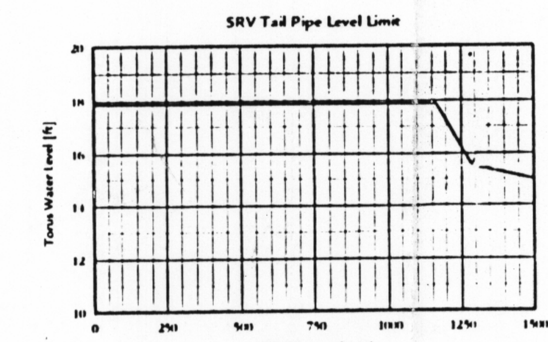
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

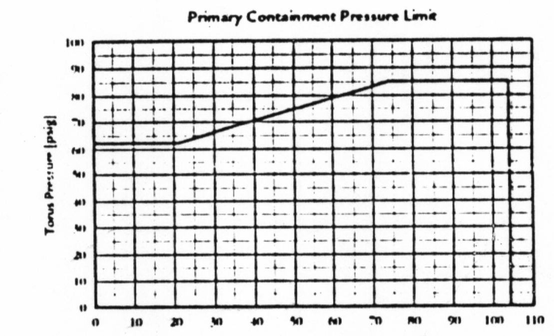
❶ An RPV water level instrument may not be used if either of the following conditions exists:
- An instrument run temperature is at or above the RPV Saturation Temperature.
- The instrument reads at or below its Minimum Usable Indicating Level.











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NEW YORK POWER AUTHORITY JAMES A. FITZPATRICK NUCLEAR POWER PLANT EMERGENCY OPERATING PROCEDURE		
RPV CONTROL		
EOP-2	Rev. 5	13 Dec 98

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