EOP-3 FAILURE TO SCRAM

FOR INFORMATION ONLY

START

While executing this procedure

IF	THEN
All control rods are inserted to or beyond position 02 OR It has been determined the reactor will remain shutdown under all conditions without boron	1. IF ____ boron injection is or becomes required, THEN ____ terminate boron injection 2. Exit this procedure and enter EOP-2 "RPV Control."

Section Rx/Q

Section RPV/P

Section RPV/L

Section ED

Monitor and control REACTOR POWER

Place the reactor mode switch in SHUTDOWN.

Has ARI reasserted?
- No → Initiate ARI
- Yes

IF	THEN
Any of the following are operating: ➢ Main Condenser ➢ Feedwater ➢ HPCI ➢ RCIC	Ensure recirculation flow is matched, to maximum.

Can reactor power be determined?
- No → Is reactor power above 2.5%?
  - No
  - Yes → Ensure the recirculation pumps are stopped.
- Yes

Lower EP-3 and execute a concurrent with this procedure

WAIT until 2% (red) on (red) APRM (two channels consistent) and (green) (green)

BEFORE (blank) (green) Bypass temperature reaches the (green) (green) (green) Temperature

BORON INJECTION IS REQUIRED.

- Override ADS.
- Ensure SLC in service with sufficient boron in the borate tank.

IF	THEN
SLC can not be placed in service with sufficient boron in the borate tank.	Ensure EP-4 and execute it concurrently with this procedure.

IF	THEN
SLC tank level drops to 0%.	Ensure SLC pumps are shutdown.

Is any CIG ambient?
- Yes
- No → Is pass the (blank) (green)

WAIT until SLC tank level drops to 40%

Terminate all boron injection. Do not restore power or control. Pumps running, for injection into the RPV may remain in service.

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 OR HAS BEEN REQUIRED	Exit "Section RPV/P" and "Section RPV/L" and enter "Section ED" of this procedure.
RPV water level cannot be determined	Use "Section RPV/L" and "Section RPV/P" of this procedure and enter EOP-7, "RPV Flooding," as "ATWS Flooding."
Torus temperature cannot be maintained below the Heat Capacity Temperature Limit	Irrespective of the resulting RPV conditions rise, 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 conditions rise, maintain RPV pressure below the SRV Tail Pipe Level Limit.
BORON INJECTION IS REQUIRED AND The steam condenser is available AND There is an indication of a steam line break	Ensure the MSIVs are open (EP-9) and the steam condenser is valved in as a heat sink. ➢ If necessary, bypass MSIV low RPV water level isolation interlocks (EP-2).

Stabilize RPV pressure below 1085 psig with the steam 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 1085 psig using the steam turbine bypass valves and Group 1 Pressure Control Systems	Augment RPV pressure control by using the steam condensing mode of RHR (GP-15G).

IF	THEN
The reactor is not shutdown.	Return to ✱.

WAIT until all control rods are inserted to or beyond position 02 (or beyond the highest position known to be required for shutdown) OR SLC tank level drops to 40% (if boron is being injected)

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

IF	THEN
MSIVs are being used to depressurize the RPV AND The condenser MSIV pneumatic supply is or becomes unavailable	Depressurize with manual MSIV operation.

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" as, for operation as the LPCI mode. Minimize 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.

Monitor and control RPV WATER LEVEL ❶

IF	THEN
RPV water level cannot be determined	Exit "Section RPV/L" and "Section RPV/P" of this procedure and enter EOP-7, "RPV Flooding," as "ATWS Flooding."
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 essential to the primary containment.
EMERGENCY RPV DEPRESSURIZATION IS OR HAS BEEN REQUIRED	Exit "Section RPV/P" and "Section RPV/L" and enter "Section ED" of this procedure.

IF	THEN
Reactor power is above 2.5% or cannot be determined AND RPV water level is above 1100 in.	Lower RPV water level by terminating and preventing all injections except SLC, RCIC and CRD (EP-5) until RPV water level is below 1100 in.
Reactor power is above 2.5% or cannot be determined AND RPV water level is above 0 in. AND Torus temperature is above the Boron Injection Initiation Temperature AND All MSIVs in open or drywell pressure is above 2.7 psig	Irrespective of reactor power or RPV water level oscillations, lower RPV water level by terminating and preventing all injections except SLC, RCIC and CRD (EP-5) until either: ➢ Reactor power drops below 2.5%. OR ➢ RPV water level drops to 0 in. OR ➢ All MSIVs remain closed and drywell pressure remains below 2.7 psig.

CAUTION: Raising RPV injection rapidly during the following step may cause a large power transient resulting in core damage.

Maintain RPV water level using rule Group 1 Water Level Control Systems between -59 in. and either:
- Lowered RPV water level limit established by overrides above.

OR
- 222.5 in.

IF	THEN
RPV water level cannot be restored and maintained above -59 in.	EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

WAIT until SLC tank level drops by 22%

IF	THEN
Reactor power cannot be restored and maintained above -59 in.	Return to ✱.

Restore and maintain RPV water level between 177" and 222.5 in.

IF	THEN
RPV water level cannot be restored and maintained above 177" in.	Maintain RPV water level above -59 in.
RPV water level cannot be restored and maintained above -59 in.	EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

Override ADS

Terminate and prevent all injections into the RPV except from SLC, RCIC and CRD (EP-5).

WAIT until all injections into the RPV except from SLC, RCIC and CRD has been terminated and prevented.

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 conditions rise, and without exception, maintain RPV pressure using Group 2 Pressure Control Systems, defined as emergency systems, as 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 OR The reactor is not shutdown.	Rapidly depressurize the RPV. Return to ✱.

WAIT until
- The shutdown cooling RPV pressure interlock clears.
- SLC tank level has lowered to 40%.

OR
- the reactor is shutdown and no boron has been injected into the RPV.

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

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

Verify termination of each of the following:
- Ionization
  - Except those overridden in accordance with the Emergency Operating Procedures
- ECCS, except CS
- Emergency Diesel Generators

Minimum Alternate RPV Flooding Pressure	
Number of SRVs Open	RPV Pressure (psig)
7 or more	110
6	131
5	160
4	204
3	276
2	422
1	856

IF | THEN

IF	THEN
RPV water level cannot be determined	Exit "Section ED" of this procedure and enter EOP-7, "RPV Flooding," as "ATWS Flooding."
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 essential to the primary containment.
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED	Exit this RPV level

IF	THEN
Reactor power is above 2.5% or cannot be determined AND RPV water level is above 1100 in.	Lower RPV water level by terminating and preventing all injections except SLC, RCIC and CRD (EP-5) until RPV water level is below 1100 in.
Reactor power is above 2.5% or cannot be determined AND RPV water level is above 0 in. AND Torus temperature is above the Boron Injection Initiation Temperature AND All MSIVs in open or drywell pressure is above 2.7 psig	Irrespective of reactor power or RPV water level oscillations, lower RPV water level by terminating and preventing all injections except SLC, RCIC and CRD (EP-5) until either: ➢ Reactor power drops below 2.5%. OR ➢ RPV water level drops to 0 in. OR ➢ All MSIVs remain closed and drywell pressure remains below 2.7 psig.

CAUTION: Raising RPV injection rapidly during the following step may cause a large power transient resulting in core damage.

Commence and slowly raise injections into the RPV using Group 1 Water Level Control Systems in order of preference, and maintain RPV water level above -59 in. Disregard pump NPSH and vortex limit if required to maintain:
- Lowered RPV water level limit established by overrides above.

OR
- 222.5 in.

IF	THEN
RPV water level cannot be restored and maintained above -59 in.	1. Commence and slowly raise injections into the RPV with Group 2 Water Level Control Systems in order of preference, and maintain RPV water level above -59 in. Disregard pump NPSH and vortex limit. 2. IF ____ RPV water level will cannot be restored and maintained above -59 in., THEN ____ PRIMARY CONTAINMENT FLOODING IS REQUIRED.

WAIT until SLC tank level drops by 22%.

IF	THEN
Reactor power cannot be restored and maintained above -59 in.	Return to ✱.

Restore and maintain RPV water level between 177" and 222.5 in.

IF	THEN
RPV water level cannot be restored and maintained above 177" in.	Maintain RPV water level above -59 in.
RPV water level cannot be restored and maintained above -59 in.	PRIMARY CONTAINMENT FLOODING IS REQUIRED.

Verify termination of each of the following:
- Ionization
  - Except those overridden in accordance with the Emergency Operating Procedures
- ECCS, except CS
- Emergency Diesel Generators

Group 1 Pressure Control Systems

Arranged Water Level Band:

- MSVs
  - Only if torus water level is above 5.5 ft.
  - If possible, open MSVs one at a time using sequence: B2R1-*1A, J, K, G, E, D, C, F, H, L, B.
  - If the condensate MSV pneumatic supply is or becomes unavailable, place the control switch for each MSV in CLOSE and pull 20 fuses.
- HPCI
  - Admit suction to the CST, if available.
- RCIC
  - Admit suction to the CST, if available.
- RWCU, recirc mode
  - Bypass the filter/demineralizers. If necessary, defeat SLC and either RWCU isolation valve (EP-2).
- RWCU, blowdown mode
  - Only if no boron has been injected into the RPV.
- Main steam line drains
- Reactor feed pumps
- SJAEs
- Steam Reboiler

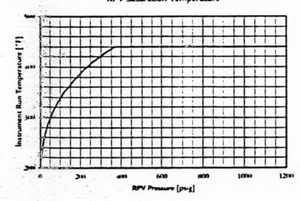
Group 1 Water Level Control Systems

Arranged Water Level Band:

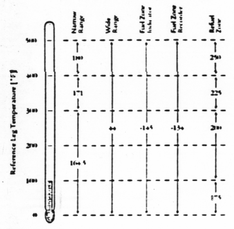
- Condensate / Feedwater
- CRD
- HPCI
  - Admit suction to the CST, if available.
  - Defeat the high area temperature ambients and high torus water level suction interlock if necessary (EP-2).
- RCIC
  - Admit suction to the CST, if available.
  - Defeat the low RPV pressure and high area temperature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

An RPV water level measurement may not be used if either of the following conditions exists:
- An instrument has a temperature as or above the RPV Saturation Temperature
- The instrument reads at or below an Minimum Usable Indicating Level

RPV Saturation Temperature



Minimum Usable Indicating Levels [in.]



Group 2 Pressure Control Systems

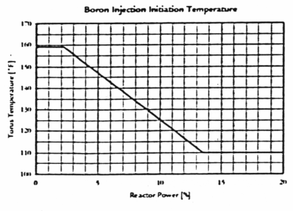
- MSVs (from Panel 02AD*-7 (EP-11)
  - Only if torus water level is above 5.5 ft.
- Main Condenser (EP-9)
- Main steam line drains
- Reactor feed pumps
- SJAEs
- Steam reboiler
- HPCI steam line
- RCIC steam line
- RWCU, recirc mode
  - Bypass the filter/demineralizers.
- RWCU, blowdown mode
  - Only if no boron has been injected into the RPV.
- Head vent
- RHR (steam condensing mode, GP-15G)
- RHR (shutdown cooling mode)
  - Only if no boron has been injected into the RPV.
  - Use only those RHR pumps not required to maintain RPV water level above 177" as, for operation as the LPCI mode.

Group 2 Water Level Control Systems

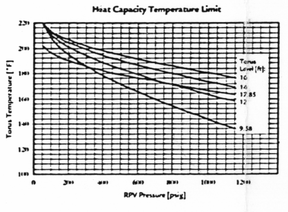
Arranged Water Level Band:

- CS
- RHR "A" or "C" loop crosstie
- Fuel Pool cross-tie
- RHR keepfill
- CS keepfill (EP-9)
- Condensate Transfer
- SLC (new or borated tank)

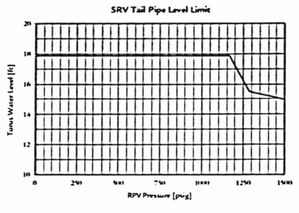
Boron Injection Initiation Temperature



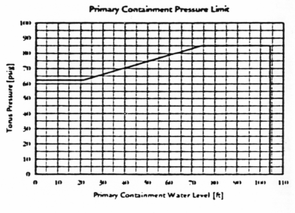
Heat Capacity Temperature Limit



SRV Tail Pipe Level Limit



Primary Containment Pressure Limit



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NEW YORK POWER AUTHORITY
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
EMERGENCY OPERATING PROCEDURE

FAILURE TO SCRAM

EOP-3	Rev. 5	13 Dec 98