101A
202
206

206A

IF while executing the following steps:	THEN:
RPV level indication is available AND The reactor is NOT shutdown under all conditions without boron	**EXIT** this procedure AND **ENTER** **101A**
The reactor will remain shutdown under all conditions without boron.	**EXIT** this procedure AND **ENTER** **206**
It is determined that core damage is occurring (**Table RF-1**)	SAG entry is required **EXIT** this procedure AND **ENTER** SAG
Drywell pressure CANNOT be maintained below **65 psig** OR Containment water level CANNOT be maintained below **67 ft.**	EXCEPT for boron injection AND CRD, **TERMINATE** RPV injection from sources outside primary containment **NOT** required for RPV flooding (2)

RF-15

Table RF-1
Core Damage Indications

- DAPA above 5,000 R
- Drywell OR suppression chamber hydrogen concentration above 2%

Cntmt Level (ft) = [(HPCI pump suction press - Drwl press) * 2.3 ft/psi] + 2.2 ft (2)

EXCEPT for boron injection, CRD, AND RCIC, **TERMINATE** AND **PREVENT** all injection into the RPV

RF-16

Is supp pool level above **0 in.**

RF-17

NO

YES

Irrespective of cooldown rate,
OPEN 5 ADS valves,
DEFEAT PCIG isolation interlocks if necessary

RF-18

Can 5 ADS valves be opened

RF-19

NO

OPEN SRVs UNTIL 5 SRVs are open
DEFEAT PCIG isolation interlocks if necessary

RF-20

YES

WHEN
either:

- RPV press is below MSCP in Table RF-P-1

OR

- Less than 2 SRVs are open

RF-21

Minimum Steam Cooling Pressure
Table RF-P-1

Number of open SRVs	MSCP (psig)
2	725
3	475
4	350
5 OR more	275

Table 1 RPV FLOODING SYSTEMS (2, 3, 4)

SYSTEM	NOTES
Feedwater (AE)	
CRD (BF)	Both pumps, if necessary
RCIC (BD)	Suction from CST, if available If necessary: - Bypass high RPV level interlocks HC.OP-EO.ZZ-324 - Bypass low RPV pressure isolation using OP-EO.ZZ-321 - Bypass high area temperature isolation using OP-AB.ZZ-135
HPCI (BJ)	Suction from CST, if available If Necessary: - Bypass high RPV level interlocks OP-EO.ZZ-325 - Bypass high torus level suction transfer - Bypass high area temperature isolation using OP-AB.ZZ-135 - **CLOSE** Core Spray valve using OP-EO.ZZ-322 as necessary
Condensate (AD)	
RHR	Inject through HXs as soon as possible Use SDC Return using OP-EO.ZZ-323

Table 2 ALTERNATE ATWS FLOODING SYSTEMS (2, 3, 4)

SYSTEM	PROCEDURE
LPCI	(BC)
Core Spray	(BE)
Condensate Transfer	OP-EO.ZZ-309
Fire Water	OP-EO.ZZ-310

EXECUTE the following steps concurrently

RF-22

COMMENCE AND **SLOWLY RAISE** injection into the RPV with Preferred ATWS Flooding Systems (**Table 1**) to establish and maintain: (5)

- At least 2 SRVs open
  AND
- RPV press above the appropriate MSCP value in Table RF-P-1

RF-23

IF necessary to establish and maintain: (5)

- At least 2 SRVs open
  AND
- RPV press above the appropriate MSCP value in Table RF-P-1

COMMENCE AND **SLOWLY RAISE** injection into the RPV with Alternate ATWS Flooding Systems (**Table 2**)

RF-24

Can at least 5 SRVs be opened

RF-25

NO

YES

Can RPV press be restored and maintained above the appropriate MSCP value in Table RF-P-1

RF-26

NO

YES

Is RPV Press at least **62 psig** above supp chamber press

RF-28

NO

YES

If **NOT** needed for RPV flooding OR boron injection,
CLOSE the following valves:

- MSIVs
- MSL Drains
- RCIC Steam Line Isolation Valves
- HPCI Steam Line Isolation Valves

RF-27

Irrespective of cooldown rate,
RAPIDLY DEPRESSURIZE the RPV with 1 or more Alternate Depressurization Systems (**Table RF-3**) UNTIL:

- RPV press can be restored and maintained above the appropriate MSCP value in Table RF-P-1
  OR
- RPV press is less than **62 psig** above supp chamber press

DEFEAT isolation interlocks, if necessary.

EXCEED offsite radioactivity release rate limits if necessary.

RF-29

Table RF-3
Alternate Depressurization Systems

- Main Condenser (AB)
- RCIC (BD)
- RFPTs (AE)
- SJAEs (AE)
- Main Steam Line Drains (AB)
- Head Vent (AB)
- HPCI (BJ) only if supp pool level is above **30 in.**

WHEN
the RPV has been flooded to the main steam lines (**Table RF-2**)

RF-30

Table RF-2
Flooded RPV Indications

Some combination of the following conditions should be observed as water fills the steam lines. No single indication can be relied upon in all events.

- Decreasing SRV tailpipe temperatures
- Actuation of SRV tailpipe acoustic monitors
- Increasing RPV pressure
- Main steam line, HPCI, or RCIC high steam flow trips
- Water leakage from the HPCI or RCIC turbine shaft seals
- If MSIVs are open, two phase flow audible near main steam tunnel, main steam chest, or main turbine valves
- If injection sources are drawing suction from the suppression pool, suppression pool level decreases as the RPV and steam lines are flooded, then stabilizes when the steam lines are full
- Instrument gross fail indication

CLOSE the following valves:

- MSIVs
- MSL Drains
- RCIC Steam Line Isolation Valves
- HPCI Steam Line Isolation Valves

RF-31

CONTROL injection into the RPV to maintain the steam lines flooded with injection as low as practicable

RF-32

(1) Ambient temperature may affect RPV water level indication and trend. Refer to Emergency Operating Procedure (EOP) Caution 1 flowchart

(2) Operation of HPCI, RCIC, RHR or Core Spray with suction from the suppression pool and pump flow above the NPSH limit may result in equipment damage. Refer to Emergency Operating Procedure (EOP) Caution 2 flowchart

(3) Elevated suppression chamber pressure may trip the RCIC turbine on high exhaust pressure.

(4) Operation of HPCI OR RCIC turbines with suction temperatures above **170°F** may result in equipment damage.

(5) A rapid increase in injection into the RPV may induce a large power excursion and result in substantial core damage.

(2) To use HPCI pump suction press, HPCI must be shutdown, the torus suction valve open, and the CST suction valve closed. The HPCI min flow valve should be momentarily opened to relieve any trapped hydraulic pressure from the CST. If HPCI pump suction press is unavailable, consult the TSC.

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ATWS - RPV FLOODING
HOPE CREEK GENERATING STATION
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30x22 P