Final Submittal

E. I. HATCH NUCLEAR PLANT
EXAM 2002-301
50-321 & 50-366
OCTOBER 16 - 18, 21 - 25, & OCTOBER 30, 2002,

1. Reactor Operator Written Examination

rsb2

Final RO Test.LXRTest
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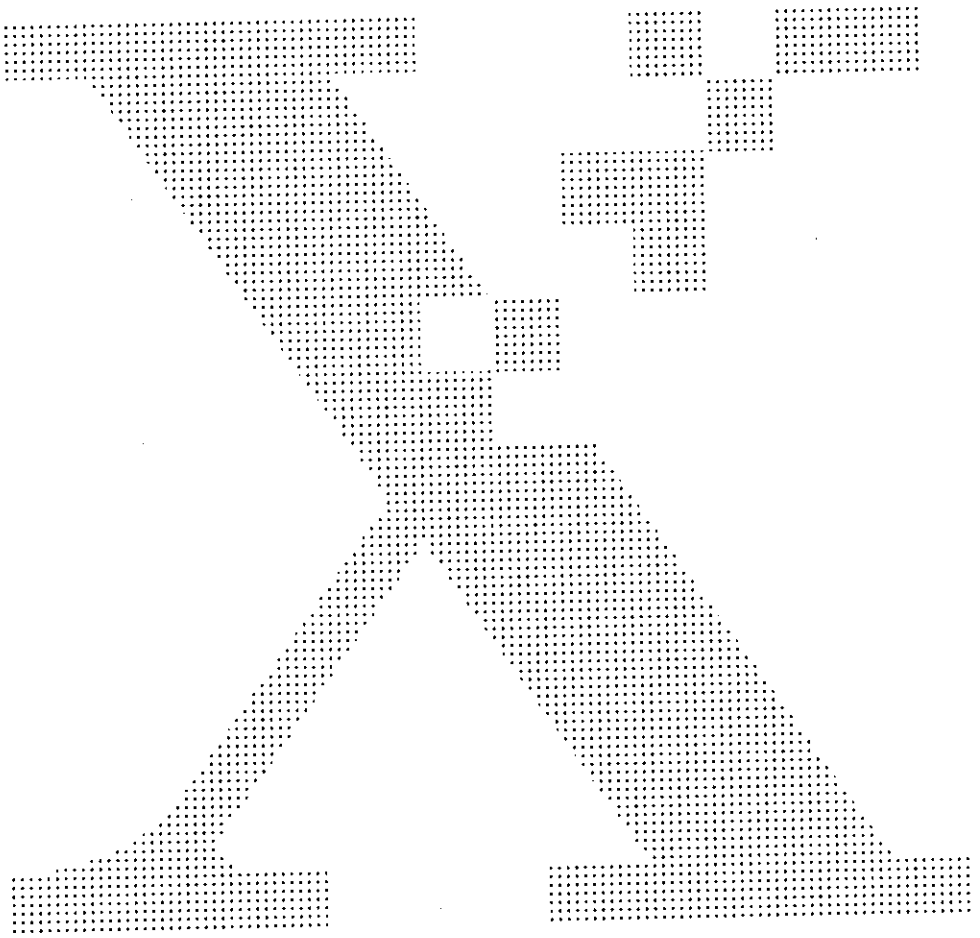

Name: _____

Final RO Test
Form: 0
Version: 0

1. 201001G2.1.28 001

Unit 2 is operating at 80% power. "2A" CRD Pump is in service. The operators observe the following indications:

Charging water pressure:	Low
Cooling water flow:	Low
Drive water flow:	Low
Cooling water dP:	Low
Drive water dP:	Low
CRD Mechanism temperatures:	Rising
Recirc Pump seal temperatures:	Rising

Which ONE of the following CRD component problems has caused these abnormal conditions? (Reference included)

A. The flow control valve has failed closed.

B. The drive water pressure control valve has closed.

C. The cooling water control valve has failed closed.

D. The drive water filter is plugged.

This test question was on the last exam.
Re-ordered answers.

Provide a copy of Fig. 12 to SI-LP-00101 Rev. 00.

2. 201001K2.02 001

Unit 1 is operating at 100% RTP.

Which ONE of the following represents the expected response of the Scram Pilot Solenoid Valves and the Backup Valves due to a loss of RPS "A"?

A. One backup scram valve energizes and half of the scram pilot solenoid valves de-energize.

B. One backup scram valve energizes and all scram pilot solenoid valves de-energize.

C. Both backup scram valves energize and all scram pilot solenoid valves de-energized.

D. Both backup scram valves remain de-energized and half of the scram pilot solenoid valves de-energize.

References: SI-LP-01001 Rev. SI-01 pg 6 & 7 of 68
EO 010.002.a.01, 200.102.a.01

A. Incorrect since a loss of RPS does not cause a backup scram valve to energize.

B. Incorrect since a loss of RPS does not cause a backup scram valve to energize and it does cause a loss of power to half of the scram pilot solenoid valves.

C. Incorrect since a loss of RPS A causes half of the scram pilot solenoid valves to de-energize.

D. Correct answer.

3. 201002A3.03 001

Per 34GO-OPS-001-2S, Plant Startup, which ONE of the following statements describes how a Rod Drift Alarm test is performed?

A. Turn the Rod Drift Test Switch to test. Verify the ROD DRIFT annunciator alarms. Reset the drift alarm with the test switch.

B. While moving a Group 1 control rod, turn the Rod Select Power Switch to off. Verify the ROD DRIFT annunciator alarms. Turn the Rod Select Power Switch to on and reset the drift alarm with the Test Switch.

C. Select a Group 1 control rod and take the Rod Movement Control Switch to out-notch. During rod travel, place the Rod Drift Alarm Test Switch to test. Verify the ROD DRIFT annunciator alarms. Reset the drift alarm with the Test Switch.

D. Turn the Rod Movement Control Switch to out-notch. When the settle bus light de-energizes turn the Rod Drift Test Switch to test. Verify the ROD DRIFT annunciator alarms. Reset the drift alarm with the Test Switch.

References: SI-LP-05401 Rev. SI-00, pg. 8 of 26.
EO 001.010.a.12

A. Incorrect since the Rod Drift alarm will not actuate due to all control rods still at an even position.

B. Incorrect since turning the Rod Select Power to off will deselect any control rod and this does not guarantee that a Rod Drift alarm will occur.

C. Correct answer.

D. Incorrect since the procedure does not require the operator to wait until the settle light goes out.

4. 202001A1.07 001

Which ONE of the following occurs when Recirculation Pump speed is increased?

A. There is a temporary increase in core void content which causes a decrease in moderator density with a resultant decrease in neutron moderation. The steam generation rate decreases which causes a positive reactivity effect.

B. There is a temporary decrease in core void content which causes an increase in moderator density with a resultant increase in neutron moderation. The steam generation rate increases which causes a negative reactivity effect.

C. There is a temporary decrease in core void content which causes an increase in moderator density with a resultant increase in neutron moderation. The steam generation rate decreases which causes a positive reactivity effect.

D. There is a temporary increase in core void content which causes a decrease in moderator density with a resultant decrease in neutron moderation. The steam generation rate increases which causes a negative reactivity effect.

References: SI-LP-00401-01 Rev. SI-01 Pg 9 of 62
FSAR Section 7.7.2, Recirculation Flow Control System

A. Incorrect since increasing recirc pump speed will decrease core void content.

B. Correct answer.

C. Incorrect since increasing Recirc Pump speed causes the steam generation rate to increase which adds negative reactivity.

D. Incorrect since increasing recirc pump speed will decrease core void content.

5. 202002K3.05 001

Unit 2 is at 100% RTP with the following conditions:

Both Reactor Recirc Pumps are in Master-Manual Control
A fuse for the power supply to the Master Controller fails
The Master Controller **de-energizes**

Which ONE of the following describes the Reactor Recirculation System response?

A. Speed will remain constant because both scoop tubes lock up.

B. BOTH Recirc Pumps will decrease speed to approximately 44% speed.

C. Both Recirc Pumps will decrease to approximately 22% speed.

D. The controller will lock in its previous signal and maintain pump speed constant.

References: SI-LP-00401-01 Rev. SI-01 pg 42 of 62.
On test SR 95-01 question 4
Updated correct answer per lesson plan. Resequenced answers.

A. Incorrect since the speed control signal was not lost.

B. Correct answer.

C. Incorrect because of clamped lower limit is 45% speed on the master controller.

D. Incorrect since this happens on a loss of signal from controller (not power loss).

6. 203000A1.01 001

During an ATWS on Unit 2, the Shift Supervisor directs injection to be terminated except for Boron, CRD and RCIC. He then directs Emergency Depressurization of the RPV because reactor water level CANNOT be maintained above -185 inches.

Which ONE of the following describes when the Shift Supervisor should recommence injection?

A. When reactor pressure is less than MARPVFP using RHR or Condensate pumps.

B. As soon as RPV pressure decreases to within the shutoff head of the RHR and Core Spray pumps.

C. When reactor pressure is less than MARPVFP using both Core Spray and RHR pumps.

D. As soon as RPV pressure decreases to within the shutoff head of the RHR and Condensate pumps.

References: LR-LP-20327 Rev. 07, pg 30 - 35 of 53
CP-3 ATWS LEVEL CONTROL
EO 201.091.a.15

A. Correct answer.

B. Incorrect since all injection is prevented except Boron, CRD and RCIC until MARPVFP is reached and Table 13 systems are available.

C. Incorrect since Core Spray is not a Table 13 system.

D. Incorrect since all injection is prevented except Boron, CRD and RCIC until MARPVFP is reached and Table 13 systems are available.

7. 204000K5.04 001

Unit 1 is operating at full power when RBCCW flow to the RWCU system is lost.

Which ONE of the following is the expected plant response of the RWCU system to this event?

A. The system will not isolate; the Holding pumps will start.

B. The system will isolate; the Holding pumps will start.

C. The system will not isolate; the Holding pumps will trip.

D. The system will isolate; the Holding pumps will trip.

References: INPO Bank for Fitzpatrick 1
SI-LP-00301-00 Rev. SI-00 pg. 17-20 of 34
EO 003.002.a.10

A. Incorrect since the system will isolate on High NRHX Outlet Temp of 140 F.

B. Correct answer.

C. Incorrect since the system will isolate on High NRHX Outlet Temp of 140 F.

D. Incorrect since the hold pumps will start on system low flow when the RWCU system isolates.

8. 205000K3.04 001

Unit 2 has entered Mode 4 by placing the "B" Loop of RHR in Shutdown Cooling. The following conditions currently exist:

Reactor Water Level	+35 inches (indicated)
Reactor Coolant Temp	185°F and decreasing
SDC flow	8000 gpm

The Control Board Operator is directed to adjust the SDC Flow to lower the cooldown rate. The SDC flow rate is found to be 7000 gpm.

Which ONE of the following describes what Recirc Loop Temperature would do under these conditions?

A. DECREASE due to greater ambient losses.

B. INCREASE due to lower flow through the loop.

C. DECREASE due to inadequate circulation through the core.

D. INCREASE due to an increase of forced circulation through the core.

References: INPO bank for Fitzpatrick 1
SI-LP-00701-00 Rev. SI-00 pg. 10 of 48
EO 007.007.a.02, 007.024.b.02

A. Incorrect since ambient losses should decrease.

B. Incorrect since pumping cooler water since natural circulation has been lost.

C. Correct answer since RWL is too low for natural circulation and the recirc loop is pumping cooler water.

D. Incorrect since natural circulation has been lost.

9. 206000A2.16 001

Unit 2 has just scrammed due to High Drywell pressure. The Control Board Operator has verified that all low pressure ECCS systems are operating and that the Diesel Generators are running unloaded. HPCI and RCIC are still in the standby condition. The following conditions exist on Unit 2:

Reactor Pressure	980 psig
Reactor Water Level	-25" increasing
Drywell Pressure	3.5 psig increasing
Drywell Temperature	215°F increasing

Which ONE of the following is the appropriate operator action(s) to take with regards to the HPCI system?

A. Leave HPCI in standby since water level is increasing.

B. Place the HPCI Aux Oil Pump in PULL-TO-LOCK per *34SO-E41-001-2S, High Pressure Coolant Injection (HPCI) System*. Declare HPCI INOPERABLE and enter Tech Spec LCO.

C. Perform a manual startup of HPCI using the HPCI Manual S/U for Vessel Injection Placard per *34SO-E41-001-2S,High Pressure Coolant Injection (HPCI) System*. Notify Shift Supervisor when HPCI is injecting.

D. Verify that HPCI is in a standby lineup since it wasn't required to start.

References: 34SO-E41-001-2S, High Pressure Coolant Injection (HPCI) System, Rev. 21.2 pg 15,26 and 58 of 63.

A. Incorrect since HPCI should have started when Drywell Pressure exceeded 1.85 psig.

B. Incorrect due to actions are required to be taken manually if an automatic action doesn't occur.

C. Correct answer.

D. Incorrect since HPCI should have started when Drywell Pressure exceeded 1.85 psig.

10. 206000K6.08 001

Unit 2 has just experienced a transient with the following conditions present:

Reactor water level	-45" increasing
Reactor pressure	123 psig
Drywell pressure	18 psig
HPCI turbine exhaust diaphragm pressure	8 psig

Which ONE of the following indicates the proper HPCI lineup for the present conditions including the cause?

A. F002 closed
F003 closed
F001 open
HPCI isolated on reactor low pressure with initiation signal still present.

B. F001 closed
F002 closed
F003 open
HPCI isolated on reactor low pressure with initiation signal still present.

C. F002 open
F003 open
Turbine Stop Valve open
HPCI should be injecting at full flow due to high drywell pressure.

D. F002 closed
F001 open
F006 closed
HPCI isolated on high turbine exhaust pressure with initiation signal still present.

References: SI-LP-00501 Rev 01 pg 30 - 33 of 46

A. Correct answer.

B. Incorrect since F001 should be open from initiation signal and F003 should be closed due to auto isolation signal.

C. Incorrect since HPCI should not be injecting due to auto isolation signal from low reactor pressure.

D. Incorrect since HPCI should not have isolated on high exhaust pressure (setpoint is 10 psig).

11. 209001G2.4.31 001

Unit 1 is in Mode 4 with work going on that has the potential to drain the reactor vessel. "A" Core Spray and "A" RHR Loop are in a standby lineup ("B" Core Spray and "B" RHR Loop are out-of-service) when reactor vessel level starts decreasing rapidly. "A" and "C" RHR pumps fail to start but "A" Core Spray is injecting at full flow to maintain level above TAF when the following alarm actuates: "CS PUMP A OVLD/LOCKOUT RELAY TRIP" ("A" Core Spray pump remains operating).

Note: Over current condition on phase 1, 2, OR 3 of 2R22-S007, Frame 9 will energize the lockout relay (86) and cause a pump trip and annunciator.

Over current condition on phase 2, of 2R22-S007, Frame 9, but at a lower current than required to energize relay 86, will energize relay 51X and cause the annunciator only.

Which ONE of the following actions should be taken with regards to the "A" Core Spray Pump?

A. Trip "A" Core Spray Pump immediately and record the relay targets actuated.

B. Trip "A" Core Spray Pump immediately and restart when targets are reset.

C. Reduce the load on the pump until the alarm clears as soon as possible since the pump is required for Adequate Core Cooling.

D. Continue to run the pump as required until vessel level is back to the normal operating level and the vessel leak is stopped.

References: 34AR-601-108-2S Rev. 1

A. Incorrect since the pump is required for Adequate Core Cooling and the pump didn't trip when the alarm initially came in.

B. Incorrect since the pump is required for Adequate Core Cooling and the pump didn't trip when the alarm initially came in.

C. Correct answer.

D. Incorrect since the load should be reduced on the pump as soon as possible.

12. 209001K5.01 001

After a large pipe break inside the drywell on Unit 2, Core Spray "A" is being used to restore reactor water level to normal. The Operator notices that Core Spray "A" flow and discharge pressure are oscillating.

Which ONE of the following is the most likely cause of these indications?

A. Vortexing.

B. Pump runout.

C. Cavitation.

D. Pump running dead-headed.

References: 34A-E11-002-2S

This question was proposed by the utility. Need to get references from utility.

A. Incorrect since conditions are not present for air entrapment. The Torus is at the normal level.

B. Incorrect since Runout would have low pressure and high flow.

C. Correct answer.

D. Incorrect since deadhaeaded conditions would initially have high discharge pressure and no flow.

13. 211000A3.04 001

Which ONE of the following contains a correct list of indications that are used to verify the Standby Liquid Control System is operating properly once the system has been initiated? (Not necessarily all the indications)

A. Squib valve loss of continuity alarm annunciated, storage tank level decreasing, discharge pressure slightly lower than reactor pressure.

B. Red light indicating pump is running, reactor water level will increase, neutron level in the reactor will increase.

C. Storage tank level increasing, RWCU suction valve 2G31-F004 closes, squib valve amber light goes off.

D. System discharge pressure will increase to greater than reactor pressure, neutron level in the reactor will decrease, RWCU suction valve 2G31-F004 closes.

References: SI-LP-01101 Rev. SI-00, pg 21 of 32.
EO 011.002.1.03

A. Incorrect since discharge pressure should be higher than reactor pressure.

B. Incorrect since reactor water level increasing is not an indication that SBLC is injecting. Also, neutron level should be decreasing.

C. Incorrect since storage tank level should decrease.

D. Correct answer.

14. 211000A4.01 001

Unit 1 is in an ATWS condition and the Shift Supervisor is directing actions per RCA RPV Control (ATWS). He has determined that Boron injection is required. The CBO initiates Boron injection per *34SO-C41-003-2S,Standby Liquid Control System*. The initial tank level indicates 86%. Two minutes later the CBO notices that the SBLC Tank level indication has failed downscale.

Which ONE of the following could be the cause of this and how will the CBO ensure that the Cold Shutdown Boron Weight has been injected?

A. Instrument air has been lost to the level detector and an Operator should be sent to verify level in the tank via the local level indication.

B. Instrument air has been lost to the level detector and an Operator should be sent to verify level in the tank via the top hatch.

C. Too much instrument air is being supplied to the bubbler detector and an Operator should adjust the flow to approximately 1 scfh.

D. Too much instrument air is being supplied to the bubbler detector and an Operator should adjust the flow to approximately 10 scfh.

Reference: RCA RPV Control (ATWS) flow chart
SI-LP-01101-00 Rev. SI-00, Standby Liquid Control
EO 011.001.a.03

A. Incorrect due to local level indication is also lost on a loss of instrument air. The level indication fails downscale on a loss of instrument air.

B. Correct answer.

C. Incorrect since too much flow to the bubbler causes level indication to be high.

D. Incorrect since too much flow to the bubbler causes level indication to be high.

15. 212000A3.05 001

Unit 2 is in Mode 1 at 27% RTP after a forced shutdown. The Shift Supervisor is reviewing work that was performed during the shutdown and notices that a required logic test for the SDV bypass switch was not completed. The test verifies that the Scram Signal for SDV Hi level can be reset with the switch in Bypass.

Which ONE of the following describes the effect of taking the SDV Hi Level Bypass switch to Bypass under the current plant conditions?

A. RPS would not actuate on any SDV Hi Level signal.

B. RPS would still actuate on any SDV Hi Level signal.

C. RPS would only actuate on a SDV Hi Level signal received from the Float Switches.

D. RPS would only actuate on a SDV Hi Level signal received from the RTD's.

Reference: SI-LP-01001-01 Rev. SI-01, Reactor Protection System pg 24 of 68.
Tech Spec section 3.3.1.1, RPS Instrumentation
EO 010.019.a.03

A. Incorrect since this switch has no affect on RPS with the Mode Switch in RUN.

B. Correct answer.

C. Incorrect since this switch has no affect on RPS with the Mode Switch in RUN.

D. Incorrect since this switch has no affect on RPS with the Mode Switch in RUN.

16. 212000K4.06 001

After a scram signal is received on Unit 2, control rods fail to insert and a manual scram is inserted. The white RPS scram group lights are **ILLUMINATED**.

Which ONE of the following describes the state of the scram solenoids and the **NEXT** action that should be taken?

A. Energized; Rods should be individually scrammed.

B. De-energized; Rods should be manually driven in.

C. Energized; RPS test switches should be taken to trip.

D. De-energized; Links for RPS solenoids should be opened.

References: 31EO-EOP-103-2S Rev4Ed2 pg 2

A. Incorrect, the scram solenoids are energized, but the next action to be taken is to place the RPS test switches to trip IAW 31-EO-EOP-103-2S.

B. Incorrect, the scram solenoids are not de-energized, however, this action can be taken concurrently IAW 31-EO-EOP-103-2S.

C. Correct, the scram solenoids are energized, and the next action to be taken is to place the RPS test switches to trip IAW 31-EO-EOP-103-2S.

D. Incorrect, the scram solenoids are not de-energized, and the next action to be taken is to place the RPS test switches to trip IAW 31-EO-EOP-103-2S.

17. 214000K4.01 001

Which ONE of the following explains why a "ROD DRIFT" alarm is received after moving a control rod using the "EMERGENCY IN" switch?

A. "EMERGENCY IN" bypasses the Rod Position Indication System.

B. The sequence timer is bypassed causing an insert and withdraw signal at the same time.

C. The rod is at an even reed switch and none of the selected relay busses are energized (insert, withdraw or settle).

D. The rod is at an odd reed switch and none of the selected relay busses are energized (insert, withdraw or settle).

References: SI-LP-05401-00 Rev. SI-00, pg 7 & 8 of 26, Reactor Manual Control
EO 001.010.a.12, 001.026.a.02

A. Incorrect since this switch does not bypass RPIS.

B. Incorrect since this does not cause an insert and withdraw signal at the same time.

C. Incorrect since being at an even reed switch position ensures a rod drift alarm does not occur.

D. Correct answer since this alarm is actuated when rod is at an odd position and relay buses are not energized.

18. 215002G2.1.23 001

Unit 2 is operating at 50% RTP and a center control rod is selected for withdrawal.

Which ONE of the following statements best describes the Rod Block Monitor nulling sequence once it has been initiated?

A. The recorder is frozen and rod select matrix lights are all extinquished until the null sequence is complete. After the nulling, the recorder will read current power level.

B. The recorder will read downscale until the null sequence is complete. After the nulling, the recorder will read 100.

C. The recorder will read 100, but control rod movement will be blocked until the nulling is complete.

D. The recorder will read upscale until the null sequence is complete. After the nulling, the recorder will read 100.

References: SI-LP-01203-00 Rev. SI-00 pg 19-22 of 51
EO 012.003.e.06

A. Incorrect since the rod select matrix lights do not extinquish and the recorder will not read the current power level.

B. Correct answer.

C. Incorrect answer since the recorder will read downscale during the nulling sequence.

D. Incorrect answer since the recorder will read downscale during the nulling sequence.

19. 215003A4.05 001

Unit 1 is in the process of starting up after a Refueling outage. The plant has just entered Mode 1 and the Reactor Operator notes the following IRM readings: (shorting links are installed)

IRM A	110/125	IRM B	112/125
IRM C	Bypassed	IRM D	114/125
IRM E	114/125	IRM F	116/125
IRM G	112/125	IRM H	110/125

Based on these readings which ONE of the following describes the affect on the plant?

A. A half scram should have occurred due to an IRM above the Hi-Hi limit.

B. A full scram should have occurred due to an IRM above the Hi-Hi limit with shorting links installed.

C. A Rod Block should have occurred due to all IRMs above rod block setpoint.

D. No affect on the plant since all of the IRM inputs are bypassed.

References: SI-LP-01202 Rev. 01 pg 21 - 23 of 40
EO 012.003.c.09, 012.003.c.10, 012.003.c.11

A. Incorrect since the IRM scram signal is bypassed with Mode Switch in RUN.

B. Incorrect since the IRM scram signal is bypassed with Mode Switch in RUN and with the shorting links installed this prevents the single IRM scram function.

C. Incorrect since the rod blocks are bypassed with the Mode Switch in RUN.

D. Correct answer.

20. 215004K2.01 001

While operating at 94% RTP on Unit 2, an event causes the following conditions:

Loss of Rx Bldg Vent Monitor B
Loss of Service Water Effluent Monitor
Loss of Stack Gas Monitor B
IRMs B, D, F and H reading downscale
SRMs B and D reading downscale

Which ONE of the following events is indicative of these indications?

A. Loss of Instrument Bus 2B

B. ✓ Loss of 24/48 VDC Bus 2B

C. Loss of Vital AC Bus

D. Loss of 125/250 VDC Bus "B"

References: SI-LP-01202 Rev. 01 pg 15 of 40
SI-LP-01201 Rev. SI-00 pg 11 of 30
LT-LP-02704 Rev. 03 pg 59 of 61
LO 012.003.a.09

A. Incorrect since this does not power the listed items.

B. Correct answer.

C. Incorrect since this does not power the listed items.

D. Incorrect since this does not power the listed items.

21. 215005A2.03 001

Unit 2 is starting up with the Reactor Mode Switch in the START/HOT STBY position. The following is the present status of each APRM with regard to LPRM inputs and indicated power level.

	APRM A	APRM B	APRM C	APRM D
Level D LPRM Inputs	6	5	6	7
Level C LPRM Inputs	5	3	8	8
Level B LPRM Inputs	6	6	5	2
Level A LPRM Inputs	5	3	6	6
Indicated Power Level	12%	14%	12%	11%

Which ONE of the following describes the plant response to these conditions and the cause for the response?

A. Half Scram due to High power on APRM "B".

B. Full Scram due to High power on APRM's "A", "B" and "C".

C. APRM UPSC TRIP/INOP SYS B Alarm due to APRM "B" having too few LPRM Inputs.

D✓ APRM UPSC TRIP/INOP SYS B Alarm due to APRM "D" having too few LPRM Inputs.

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References: SI-LP-01203-00 Rev. SI-00 pg 8-9 of 51
EO 012.003.d.01

A. Incorrect since Full Scram would occur if power reached 13% with Mode Switch in START/HOT STBY.

B. Incorrect since power level is too low for scram condition. (13% with Mode Switch in START/HOT STBY)

C. Incorrect since APRM B has the minimum LPRM Inputs required (17).

D. Correct answer.

22. 216000K2.01 001

Which ONE of the following describes the results of a loss of the 2B RPS bus to the Analog Transmitter Trip System (ATTS)?

A. A complete loss of power to panels P921 and P923.

B. A loss of one of the two power supplies to panels P921 and P923.

C. A loss of one of the two power supplies to panels P922 and P924.

D. A complete loss of power to panels P922 and P924.

Reference: LT-LP-10008 Rev. SI-00 pg 7 of 28.
EO 055.001.a.07

A. Incorrect since a loss of 2B RPS does not affect panels P921 and P923.

B. Incorrect since a loss of 2B RPS does not affect panel P921 or P923.

C. Incorrect since a loss of 2B RPS affects both panels P922 and P924.

D. Correct answer.

23. 217000K1.01 001

Unit 2 is operating at 80% RTP. The RCIC system is in standby with a suction from the CST. The quarterly HPCI flow rate test is in progress and is taking longer than expected. Torus level has reached 151" and preparations are being made to pump the torus down to normal level within the 2 hour Tech Spec time limit.

Which ONE of the following describes the effect high Torus level had on RCIC?

A. No effect since the RCIC suction valves do not transfer until 152".

B. The Torus suction valves (F029 & F031) received an open signal and once both valves were full open then the CST suction valve (F010) received a closed signal.

C. The Torus suction valves (F029 & F031) received an open signal at the same time the CST suction valve (F010) received a closed signal.

D. The CST suction valve (F010) received a closed signal and when it was full closed then the Torus suction valves (F029 & F031) received an open signal.

References: SI-LP-03901 Rev. SI-00 pg 10 of 37

A. Incorrect since the U2 RCIC suction swap takes place at a suppression pool level of 150.5" Unit 1 takes place at 152".

B. Correct answer.

C. Incorrect since the CST and Torus suction valves do not get a signal to change position at the same time. The CST gets a closed signal "After" the Torus suction valves are full open.

D. Incorrect since the Torus suction valves come open before the CST suction valve goes closed.

24. 219000A2.08 001

Unit 1 is operating at 100% RTP. The Plant Operator (PO) has placed the 1B RHR pump in Torus Cooling Mode. "Rx Bldg Floor Drains Sump B Leak High" alarm is received followed shortly by "RHR Pump B Trip." A System Operator (SO) in the area notifies the PO that there is excessive leakage in the pump seal area for the 1B RHR pump.

Which ONE of the following describes the impact on the RHR System and what are the appropriate actions to take per the Alarm Response procedures?
(Provide copy of Tech Spec Section 3.5.1)

A. Declare Division 2 of RHR INOPERABLE, send an Operator to the SWGR to look for flags and place the "B" RHR Pump control switch in STOP.

B. Declare the "B" RHR Pump INOPERABLE, verify the suction valve lineup, isolate Division 2 of RHR and reset the sump timers.

C. Declare Division 2 of RHR INOPERABLE, verify the suction valve lineup, isolate the "B" RHR Pump and reset the sump timers.

D. Declare the "B" RHR Pump INOPERABLE, send an Operator to the SWGR to look for flags and isolate Division 2 of RHR.

References: 34AR-601-206-1S Rev. 3.1
34AR-602-401-1S Rev. 0.1

A. Incorrect since you need to isolate the pump.

B. Incorrect since you need to call the entire loop INOPERABLE, not just the pump.

C. Correct answer.

D. Incorrect since you do not have to isolate the entire Loop of RHR, just the pump. Also, you should declare the entire loop Inoperable.

25. 223001A2.12 001

Unit 1 has scrammed on vessel low level due to loss of all High Pressure feed. The crew emergency depressurized the RPV before level reached -185". 1A Core Spray pump is operating to restore reactor water level with the following plant conditions:

Reactor Water Level	-120 inches and Increasing
Reactor Pressure	45 psig
Suppression Pool Temperature	190°F
Suppression Pool Water Level	145 inches
Suppression Chamber Pressure	3 psig
1A Core Spray Flow	4600 gpm

Which ONE of the following actions should the crew take concerning the continued use of 1A Core Spray pump?
(Provide Graph 9, 11A and 11B)

A. REDUCE flow to get back within Vortex limits.

B. CONTINUE flow at the present rate since it is within NPSH and Vortex limits.

C. REDUCE flow to get back within NPSH limits.

D. CONTINUE flow at the present rate ignoring NPSH and Vortex limits.

Reference: Core Spray Pump NPSH Limit Graph 11B
Core Spray Vortex Limit Graph 9
Students will be supplied with both graphs.

A. Incorrect since 1A Core Spray pump is within Vortex limits.

B. Incorrect since EOP's direct you bace to RC RPV CONTROL after vessel level is increasing above top of active fuel and now Vortex and NPSH limits are a concern.

C. Correct answer.

D. Incorrect since CP-1 has been exited to RC RPV CONTROL point B.

26. 223002K1.07 001

U-2 RCIC System is running with the following conditions present 10 minutes after the event:

Reactor Water Level	-38"
Drywell Pressure	+1.5 psig
Suppression Chamber Ambient Temp.	170°F
RCIC Steam Line pressure	900 psig
RCIC Emergency Area Cooler Temp	100°F and rising slowly

An operator has been sent to the RCIC room and reports that there is a small steam leak on the line upstream of the Trip and Throttle valve. The Shift Supervisor orders the Reactor Operator to manually isolate RCIC.

Which ONE of the following describes the effect on RCIC when the manual isolation pushbutton is depressed?

A. Isolation valves F007 and F008 close and the RCIC turbine trips.

B. Inboard Isolation valve F007 closes and the RCIC turbine trips.

C. Outboard Isolation valve F008 closes and the RCIC turbine trips.

D. No effect on RCIC since the system should already be isolated.

Reference: SI-LP-03901-00 Rev. SI-00 pg 17 of 37.
EO 039.012.a.04

A. Incorrect since only the F008 valve is affected by the "Manual Isolation" pushbutton while there is an initiation signal present.

B. Incorrect since the F007 valve is not affected by the "Manual Isolation" pushbutton while there is an initiation signal present.

C. Correct answer.

D. Incorrect since the only isolation signal could be Suppression Chamber Ambient Temp but it has a 30 minute time delay when temp is $\geq$ 165°F and this is 10 minutes into the event.

27. 226001K2.02 001

Unit 2 is operating at 100% power with the following equipment out-of-service:

- 230KV breakers 470 & 480 are open to perform testing on Startup Transformer 2C.
- EDG 1B due to oil leak just found (repairs in progress).

While waiting for the repairs to be completed for the 1B EDG Unit 2 experiences a Reactor Scram on High Drywell pressure due to a failure of Recirc Pump 2B seals. All automatic actions occur as designed with the current plant lineup. The 2B RHR Pump is _____ due to _____.

A. running, power supplied from 2C EDG.

B. not running, power not supplied from 1B EDG.

C. running, power supplied from SAT 2D.

D. not running, power not supplied from SAT 2C.

Reference: LT-LP-02701-03 Rev. 03 Electrical Distribution - Switchyard
LT-LP-02702-03 Rev. 03 4160 VAC Electrical Distribution
Tech Specs and Bases Section 3.8.1
EO 200.017.a.03

A. Incorrect since SAT 2D is still energized.

B. Incorrect due to power still available from SAT 2D.

C. Correct answer.

D. Incorrect since SAT 2D is the power supply.

28. 234000K6.02 001

Unit 2 is in a Refueling Outage with a core reload in progress. All Refueling related surveillances are current. The Unit CBO receives the "600V BUS 2C BREAKER TRIP" alarm and upon investigation determines a loss of 2R24-S011.

Based on this information which ONE of the following describes how Refueling Operations are affected?

A. Core Alterations can continue since a "refuel bridge stopped" alarm has not occured.

B. Core Alterations must be suspended immediately OR declare associated AC supported required features inoperable.

C. Core Alterations can continue until the next scheduled AC breaker alignment and voltage checks are due since power is still available to the refueling equipment.

D. Core Alterations can continue for 1 hr provided AC breaker alignment and voltage checks are completed within that hour.

References: Tech Spec 3.8.8 Distribution - Systems Shutdown
Tech Spec Bases 3.8.8 Distribution Systems - Shutdown Bases
LT-LP-02705-02 Rev.02 pg 30 of 42

A. Incorrect since the AC distribution system must be determined INOPERABLE due to the low voltage so Core Alterations must be stopped immediately.

B. Correct answer.

C. Incorrect since equipment must be declared INOPERABLE upon discovery on not being able to meet minimum requirements.

D. Incorrect since 1 hour is not provided to continue Core Alterations in the Tech Specs.

29. 239001K4.04 001

Which ONE of the following describes the purpose of the Main Steam Line Flow Restrictors?

A. To prevent the uncontrolled release of radioactive material to the environs following a steam line rupture outside containment to the extent that the CFR 100 limits are not exceeded at the site boundary.

B. To limit the loading on the steam lines following a steam line rupture outside containment such that the failure of one steam line would not result in a MSIV isolation from high main steam line flow.

C. To limit the pressure reduction following a steam line rupture outside containment such that the safety limit of 785 psig is not reached with reactor power >25% prior to the MSIV's closing.

D. To work in conjunction with the MSIV's to limit flow on a steam line rupture which assures the steam dryer and other internal structures in the vessel remain in place.

Reference: SI-LP-01401-00 Rev. 00 Pg 9 of 45

A. Incorrect since the isolation of the MSIV's perform this function.

B. Incorrect since the flow restrictors limit the loss of coolant from the vessel on a steam line break.

C. Incorrect since the flow restrictors are concerned with the loss of coolant and not the pressure reduction.

D. Correct answer.

30. 239002A1.01 001

Unit 1 reactor has just scrammed due to an inadvertent Group I isolation. The Shift Supervisor has entered RC RPV CONTROL (NON-ATWS) and ordered a reactor pressure band of 800 - 1080 psig using the relief valves.

Which ONE of the following describes the indications you would expect to see when you opened a relief valve?

A. The RED indicator light is lit, annunciator SAFETY BLOWDOWN PRESSURE HIGH is clear, and reactor pressure is decreasing.

B. The GREEN indicator light will extinguish, the YELLOW indicator light is not lit, and tailpipe temperature indication is increasing.

C. The YELLOW indicator light is lit, annunciator SAFETY BLOWDOWN PRESSURE HIGH is alarming, and tailpipe temperature indication is increasing.

D. Reactor pressure is decreasing, the RED indicator light is out, and the GREEN indicator light is out.

References: 34SO-B21-001-2S, Automatic Depressurization (ADS) and Low-Low Set (LLS) System, Rev.13.3 pg 16 of 31

A. Incorrect since the annunciator for SAFETY BLOWDOWN PRESSURE HIGH should be in alarm.

B. Incorrect since the YELLOW light should illuminate.

C. Correct answer.

D. Incorrect since the RED indicating light should be illuminated.

31. 239002K6.05 001

A Safety/Relief Valve tailpipe vacuum breaker has failed in the "OPEN" position.

Which ONE of the following describes the effect on containment and the Safety/Relief Valve if the relief valve with the failed vacuum breaker lifts?

A. Drywell pressure would increase before Torus pressure during the time the relief valve was open and the relief valve would operate normally.

B. Torus pressure would increase before Drywell pressure during the time the relief valve was open and the relief valve would operate normally.

C. Drywell pressure would not be affected during the time the relief valve was open and the relief valve would open at a lower pressure.

D. Torus pressure would not be affected during the time the relief valve was open and the relief valve would open at a higher pressure.

References: FSAR Section 6.2

A. Correct answer.

B. Incorrect since the vacuum breakers are physically located in the Drywell.

C. Incorrect since Drywell pressure will increase when the relief valve is open due to the location of the vacuum breaker.

D. Incorrect since Torus pressure would increase after Drywell pressure increases due to the location of the vacuum breakers.

32. 241000K6.05 001

Unit 2 is holding load at 75% Reactor Power when the operator receives the "Turbine Vacuum Low" alarm.

Which ONE of the following describes the expected sequence of actions as condenser vacuum continues to decrease from 24.7" Hg Vac (alarm setoint) to 0" Hg Vac?

A. 1st - Main Turbine trips.
2nd - RFP turbine trips and Main Turbine Bypass Valves close at the same time.
3rd - MSIV's close.

B. 1st - Main Turbine and RFP turbine trip at the same time.
2nd - Main Turbine Bypass Valves close.
3rd - MSIV's close.

C. 1st - Main Turbine and RFP turbine trip at the same time.
2nd - MSIV's close.
3rd - Main Turbine Bypass Valves close.

D. 1st - RFP turbine trips and Main Turbine Bypass Valves close at the same time.
2nd - MSIV's close.
3rd - Main Turbine trips.

Reference: SI-LP-02501-00 Rev. SI-00 Pg 7 of 13.
EO 200.087.a.01

A. Incorrect since RFP's and Main Turbine trip at the same time at 22.3" Hg Vac.

B. Incorrect since MSIV's close at 10" Hg Vac and Bypass valves close at 7" Hg Vac.

C. Correct answser since RFP's and Main Turbine trip at the same time at 22.3" Hg Vac, MSIV's close at 10" Hg Vac and Bypass valves close at 7" Hg Vac.

D. Incorrect since Main Turbine trips prior to the MSIV's closing.

33. 245000K1.09 001

Which ONE of the following describes the effect that a loss of the "2A" 125/250V DC Switchgear will have on the Unit 2 Main Turbine Generator?

A. Remote trip capability for the generator output breakers AND the exciter field breaker will be lost.

B. Remote trip capability for the generator output breaker will be lost, but the exciter field breaker can still be controlled remotely.

C. The generator output breakers will fail to open automatically, but the exciter field breaker can still be tripped from the control room.

D. The generator output breakers will fail to open automatically AND the exciter field breaker must be opened locally.

References: 34AB-R22-001-2S Rev.2.3 Pg 3

A. Incorrect, IAW 34-AB-R22-001-2S the generator output breakers will not open automatically. However, they will open from the control room but the exciter field breaker must be opened locally.

B. Incorrect, IAW 34-AB-R22-001-2S the generator output breakers will not open automatically and the exciter field breaker must be opened locally.

C. Incorrect, IAW 34-AB-R22-001-2S the generator output breakers will fail to open automatically, however, the exciter field breaker must be opened locally.

D. Correct, IAW 34-AB-R22-001-2S the generator output breakers will fail to open automatically and the exciter field breaker must be opened locally.

34. 256000K1.05 001

Unit 2 is operating at 80% RTP. An operator inadvertently opens the Unit 2 Condensate Suction Pressure Control Valve "Bypass Valve" (*2N21-F182, Condensate Supply to CRD*).

Which ONE of the following describes the probable consequences which will occur because of this action?

A. Opening 2N21-F182 could result in excessive condensate system losses via recirc flow back to the CST through the CRD suction line from the CST.

B. Opening 2N21-F182 increases the NPSH to the CRD pump which could result in the CRD pump discharge pressure exceeding its design pressure limit of 1510 psig.

C. Opening 2N21-F182 may result in excessively high CRD pump suction pressure which could cause overpressurization of the CRD suction piping if the suction relief valve capacity is exceeded.

D. The CRD pump suction pressure trip is set such that the pump will trip above 18" Hg Vac; opening 2N21-F182 will cause the pump suction pressure trip to activate.

References: LT-LP-00101-00 Rev. 04 pg. 14 of 28
EO 001.005.a.07

A. Incorrect since water is prevented from going back to the CST by a check valve.

B. Incorrect since there are other means of preventing the CRD system from reaching its design pressure limit.

C. Correct answer.

D. Incorrect since the CRD pumps trip on low suction pressure.

35. 259001K1.05 001

Which ONE of the following describes the sequence of components that condensate would pass through to get from the Main Condenser to the Reactor Vessel?

A. Condensate Booster Pumps, Gland Seal Condenser, Condensate Pumps, 10th Stage Feedwater Heaters, Reactor Feed Pumps.

B. Condensate Pumps, Condensate Booster Pumps, Condensate Demins, Reactor Feed Pumps, 4th Stage "A" Heater.

C. Condensate Pumps, Gland Seal Condenser, Condensate Booster Pumps, 6th Stage Feedwater Heater, Reactor Feed Pumps.

D. Condensate Pumps, 4th Stage "A" Heater, 6th Stage Feedwater Heater, Reactor Feed Pumps, Feedwater Level Control Valves.

References: SI-LP-00201 Rev. SI-00 Figure 01

A. Incorrect since the Condensate Pumps come before the Condensate Booster Pumps.

B. Incorrect since Condensate Demins come before the Condensate Booster Pumps.

C. Correct answer.

D. Incorrect since 6th stage heater comes before the 4th stage heater.

36. 259002K3.02 001

Unit 2 is holding load at 80% Reactor Power. The Feedwater Level Control system is in 3 element control.

Which ONE of the following describes what RPV water level should do if a loss of control signal from RFPT "A" M/A controller occurred?

A. INCREASE due to loss of a feed flow signal resulting in a steam flow / feed flow mismatch.

B. REMAIN THE SAME due to RFPT "A" decreasing speed to it's "low speed stop" and the "B" RFPT increasing speed toward it's "high speed stop".

C. DECREASE initially and STABILIZE approximately 6" lower due to loss of feed flow input.

D. REMAIN THE SAME due to RFPT "A" defaulting to the speed setter and RFPT "B" controlling level in auto.

Reference: SI-LP-00201-00 Rev. SI-00 Pg. 27 of 47.
Question #LT-LP-002027-0002
EO 002.004.a.08
Minor rewording of question and order of answers.

A. Incorrect since loss of signal results in default level signal being used (37") for the failed controller to the associated RFPT.

B. Incorrect since RFPT with failure does not go to low speed stop and the unaffected RFPT does not go towards the high speed stop.

C. Incorrect since level is maintained by the unaffected RFPT at the normal operating level.

D. Correct answer.

37. 261000K4.01 001

The following Unit 1 reactor zone exhaust ventilation radiation levels exist:

1D11-K609A	12 mR/hr
1D11-K609B	14 mR/hr
1D11-K609C	10 mR/hr
1D11-K609D	11 mR/hr

Which ONE of the following reflects the plant response to the above conditions?

A. Unit 1 and 2 Refueling Floor and Reactor Building supply and exhaust fans trip and isolate and Unit 1 and 2 SBGT starts and aligns to the Reactor Building and Refueling Floor.

B. Unit 1 Refueling Floor and Reactor Building supply and exhaust fans trip and isolate and Unit 1 SBGT starts and aligns to the Reactor Building and Refueling Floor.

C. Unit 1 and 2 Reactor Building supply and exhaust fans trip and isolate and Unit 1 and 2 SBGT starts and aligns to the Reactor Building only.

D. Unit 1 and 2 Reactor Building and Refueling Floor ventilation systems remain in operation and neither SBGT fan starts.

Reference: SI-LP-01302-00 Rev. SI-0 Pg. 16 of 21
Question # LR-LP-200023-0001
EO 013.031.a.05, 013.038.a.08

A. Incorrect since none of these instruments are reading >18 mR/hr so nothing will automatically cause fans to trip and isolate and SBGT to start for both units.

B. Incorrect since both units are affected by any of these instruments reading >18 mR/hr.

C. Incorrect since the Refuel Floor fans and dampers would be affected by these signals if the threshold wee met.

D. Correct answer. None of the instrument readings meet the threshold for actuating the Reactor Building and Refueling Floor vents and starting SBGT (K609 A-D reading >18 mR/hr for Unit 1).

Modified the initial conditions so that the student must realize that the threshold has not been met to cause initiations since the readings are for Unit 1. If the readings were for Unit 2 then the initiations would occur.

38. 262001A4.02 001

Which ONE of the following states how to adjust main generator output voltage and the consequences of improperly setting the main generator output voltage with respect to system voltage during manual synchronization?

A. Adjust the generator output voltage using the Auto Voltage Adjust control switch and if generator output voltage is greater than system voltage then Reactive load will be positive.

B. Adjust the generator output voltage using the Manual Voltage Adjust control switch and if generator output voltage is less than system voltage then Reactive load will be negative.

C. Adjust the generator output voltage using the Auto Voltage Adjust control switch and if generator output voltage is less than system voltage then Reactive load will be positive.

D. Adjust the generator output voltage using the Manual Voltage Adjust control switch and if generator output voltage is greater than system voltage then Reactive load will be negative.

References: INPO 2001 Exam Bank (question 262001.A4.0 155)
34SO-N40-001-2S, Main Generator Operation Rev. 10.5, pg 13 - 16 of 53.

A. Correct answer.

B. Incorrect answer since you have to use the Auto Voltage Adjust control switch to match voltages.

C. Incorrect since the VAR flow will be from the system to the generator.

D. Incorrect since the VAR flow will be from the generator to the system and you use the Auto Voltage Adjust control switch to match voltages.

39. 263000K3.01 001

Unit 2 is operating at 50% RTP when the following annunciators alarm:

ARI OUT OF SERVICE
LOSS OF OFF SITE POWER
4160V BUS 2E or 600v BUS 2C DC OFF
125/250V BATT VOLTS LOW OR FUSE TROUBLE
125/250V BATT CHGR MALFUNCTION

The Control Board Operator verifies that 125VDC Cabinet 2D has been lost.

Which ONE of the following describes the impact on the Diesel Generators that supply Unit 2 Buses?

A. 2A Diesel Generator is INOPERABLE due to loss of auto start capability.

B. 2C Diesel Generator is INOPERABLE due to loss of auto start capability.

C. 2A and 2C Diesel Generators are INOPERABLE due to loss of auto start capability.

D. 1B Diesel Generator is INOPERABLE to Unit 2 due to loss of auto start capability to Unit 2.

References: 34AB-R22-001-2S, Loss of DC Buses Rev. 2.3 pg 17,18, and 59 of 66.

A. Correct answer.

B. Incorrect since the 2C Diesel Generator is unaffected by this loss.

C. Incorrect since the 2C Diesel Generator is unaffected by this loss.

D. Incorrect since the 1B Diesel Generator is unaffected by this loss.

40. 264000A1.01 001

The 2A Emergency Diesel Generator is running loaded and tied to the bus for the normal Monthly load test. While adjusting the load to maintain between 1710 and 2000 KW the D/G trips. The following conditions existed at the time of the trip:

Engine Speed	980 RPM
Lube Oil Pressure	22 psig
Lube Oil Temp	240°F
Jacket Water Temp	200°F
Jacket Water Pressure	14 psig

Which ONE of the following is the most likely cause of the D/G trip?

A. Engine Overspeed.

B. High Jacket Water Temp.

C. Low Lube Oil Pressure.

D. High Lube Oil Temperature.

References: LT-LP-02801-03 Rev. 03 pg 43 and 44 of 87
EO 028.023.a.02
34SO-R43-001-2

A. Incorrect since this is below the setpoint of 1000 ± 10 RPM.

B. Incorrect since the setpoint for High Jacket Water Temp Trip is 205 F.

C. Incorrect since the setpoint for the Low Lube Oil Pressure trip is 21 psig decreasing.

D. Correct answer.

41. 264000K3.01 001

Unit 1 has experienced a LOCA with a LOSP. Emergency Diesel Generators "1A" and "1B" are running with their output breakers closed. Emergency Diesel Generator "1C" has failed to start. Approximately 25 seconds after EDG "1A" and "1B" receive the start signal you notice the following pump status:

Pumps Running	Pumps Idle
"1A" Core Spray Pump	"1A" PSW Pump
"1C" RHR Pump	"1B" PSW Pump
	"A, B and D" RHR Pumps
	"1B" Core Spray Pump

Which ONE of the following describes the pumps that you would expect to be operating for this condition?

A. PSW pump "1A" should also be running.

B. "A" and "D" RHR pumps should also be running.

C. "A", "B" and "D" RHR pumps should also be running.

D. "B" Core Spray, "A" and "D" RHR pumps and "1A" PSW pump should also be running.

References: LT-LP-02801 Rev. 03, pg 49-50 of 87
EO 028.025.a.02

A. Incorrect since the PSW pumps are load-shed upon an auto start of the D/G.

B. Correct answer.

C. Incorrect since "B" RHR pump is powered from the 1C D/G which has failed.

D. Incorrect since "B" Core Spray is powered from 1C D/G which has failed and the "1A" PSW pump should not have started.

42. 268000A1.01 001

The Unit 2 Radwaste Operator is in the process of discharging the Chemical Waste Sample Tank 2B to the discharge canal at 65 gpm, when the discharge radiation monitor exceeds the HIGH trip setpoint.

Which ONE of the following describes ALL of the expected actions for this condition?

A. The Radwaste Effluent High Radiation alarm will annunciate.

B. The Radwaste Effluent High Radiation alarm will annunciate and the dilution flow line will isolate.

C. The Radwaste Effluent High Radiation alarm will annunciate and the High Flow canal discharge line will isolate.

D. The Radwaste Effluent High Radiation alarm will annunciate and the High and Low Flow canal discharge lines will isolate.

Reference: LT-LP-02901-02 Rev. 02 pg 36 of 46.
34AR-601-401-2S Rev. 0.2

A. Incorrect since the high discharge trip setpoint will also auto close the high and low canal discharge lines.

B. Incorrect since the high discharge trip setpoint will auto close the high and low canal discharge lines but do not affect the dilution flow line.

C. Incorrect since the high discharge trip setpoint will also auto close the low canal discharge line.

D. Correct answer.

43. 271000K4.08 001

The following Unit 2 valves have automatically closed:

Main Stack Inlet valve 2N62-F057
Holdup Volume Drain valve 2N62-F085
Offgas Moisture Separator drain to the Main Condenser 2N62-F030A/B

Which ONE of the following is most likely to have caused this plant condition?

A. BOTH Off-Gas Pre-treat Monitors Hi-Hi.

B. ONE Off-Gas Post-treat Monitor downscale and ONE Off-Gas Post-treat Monitor Hi-Hi-Hi.

C. BOTH Stack Gas Monitors Hi-Hi.

D. Recombiner building CCW out of Off-Gas Condenser reading 148 F.

References: LT-LP-03101-03 Rev. 03 pg 20-22 of 44.
EO 031.001.a.15

A. Incorrect since this alarm does not cause any isolations.

B. Correct answer since any combination of downscale or Hi-Hi-Hi in both trip systems simultaneously causes these valves to isolate.

C. Incorrect since this setpoint causes the Main Stack Effluent Accident Range Gas Monitor to actuate.

D. Incorrect since a temperature of 140 F causes 2N62-F003 A/B to close.

(Changed answer C and D from OffGas Carbon Vault Monitors Inop and Main Steam Line Radiation Monitors greater than 3x normal to the ones that were listed. Changed answer B to actuate on any combination of setpoints. Added information to answers for the number of monitors that were in alarm. Modified the list of valves in the stem).

44. 272000K2.05 001

Unit 1 is operating at 75% RTP when the "A" RPS MG Set inadvertently trips on undervoltage.

Which ONE of the following radiation monitors is INOPERABLE until RPS "A" is restored?

A. RBCCW discharge monitor.

B. Main Stack Radiation monitor.

C. Offgas pretreat rad monitor.

D. "A" Reactor Building Vent Exhaust monitor.

References: LT-LP-10007 Rev. 04 pg 17-27 of 73.

A. Incorrect since this is powered by 24 VDC Cabinet "B", R25-S016.

B. Incorrect since this is powered by 24 VDC Cabinet "A" and "B".

C. Incorrect since this is powered by their NUMAC monitors which receive power from RPS "B".

D. Correct answer.

45. 286000A1.01 001

Unit 1 is in a Refueling outage with the 4160 VAC 1E bus tagged out and de-energized for maintenance. A fire is detected resulting in main fire header pressure decreasing.

Which ONE of the following is the expected fire protection system response?

A. The motor driven fire pump starts at 110 psig; the first engine driven pump starts at 100 psig and the second engine driven pump starts at 90 psig.

B. The motor driven fire pump does not start; the first engine driven pump starts at 110 psig and the second engine driven pump starts at 100 psig.

C. The motor driven fire pump does not start; the first engine driven fire pump starts at 110 psig and the second engine driven pump starts at 90 psig.

D. The motor driven fire pump does not start; the first engine driven fire pump starts at 100 psig and the second engine driven pump starts at 90 psig.

References: LT-LP-03601Rev.3 pg 19 and 21

A. Incorrect since motor driven pump does not have electrical power and starting pressures are incorrect.

B. Incorrect since pumps start at different pressures..

C. Incorrect since first engine driven fire pump starts at 100 psig.

D. Correct answer.

46. 288000A2.05 001

The weather forcast for the oncoming shift is high winds with the temperature dropping to the low teens. The System Operator (SO) is performing outside rounds and notes that upon entering the 2A D/G room that the temperature is abnormally cold.

Which ONE of the following describes the possible impact on the plant and the correct compensatory actions for this situation?

A. 2A D/G could become INOPERABLE due to cold conditions. Start the D/G to warm up the room. Install temporary heaters to maintain temperature above 60°F.

B. The D/G cooling water system could freeze which would INOP the 2A D/G. Install temporary heating units to supplement the room heaters and install temporary temperature indication in the room.

C. 2A D/G oil could cool down and affect the auto start capability of the D/G. Verify room heaters are operating properly. Declare the D/G INOPERABLE if room temperature is <60°F for 12 hours.

D. 2A D/G could become INOPERABLE due to cold conditions. Verify D/G room and switchgear room louvers are completely closed. Also, verify room heaters are energized and maintaining temperature.

References: DI-OPS-36-0989N Rev. 13 pg 1 of 4.

A. Incorrect since D/G does not become INOPERABLE immediately. Also, there isn't direction to install temporary heating.

B. Incorrect since the D/G cooling water can't freeze since it is filled with anti freeze. Also, no direction to install temporary heating and temperature indication.

C. Incorrect since the oil is heated with an immersion heater to maintain proper temperature. No direction to declare D/G INOPERABLE if temp goes below 60°F.

D. Correct answer.

47. 290001A3.01 001

Units 1 and 2 are operating at 100% power when a Hi-Hi alarm is received on reactor building exhaust ventilation radiation monitor channels 1D11-K609A and B. Channels 1D11-K609C and D are reading normal.

Which ONE of the following describes the response of the Secondary Containment Systems?

A. Unit 1 and 2 SBGT systems auto start. Unit 1 and 2 Reactor Building ventilation trips and all isolation valves close.

B. Unit 1 and 2 SBGT systems auto start. Unit 1 and 2 Reactor Building ventilation trips and only the inboard isolation valves close.

C. Unit 1 SBGT system auto starts. Unit 1 Reactor Building ventilation trips and all the Unit 1 isolation valves close.

D. Unit 2 SBGT system auto starts. Unit 2 Reactor Building ventilation trips and all the Unit 2 isolation valves close.

Reference: LT-LP-10007 Rev. 04, pg. 28
EO 200.030.a.10
Revised distractors and stem to make it more plausible.

A. Incorrect since only the inboard isolation valves close.

B. Correct answer.

C. Incorrect since both trains of SBGT and both units Rx Bldg Vents isolate with only the inboard isolation valves going closed.

D. Incorrect since both trains of SBGT and both units Rx Bldg Vents isolate with only the inboard isolation valves going closed.

48. 290002G2.1.28 001

Which ONE of the following statements CORRECTLY describes a component within the RPV?

A. The baffle plate provides a mounting surface for the jet pump diffusers and separates the downcomer area from the below core plate area.

B. Flow orifices are mounted in the control rod housing, directly aligned with the fuel support piece.

C. The steam seperator dries the steam/fluid mixture to 99.9% quality.

D. The Standby Liquid Control/Core dp Pipe is a permanently mounted pipe within a pipe with the outer pipe used for SBLC injection.

References: SI-LP-04402 Rev. SI-00 pg 4-10 of 27
LO LT-04402.001

A. Correct answer.

B. Incorrect since the flow orifices are located in the fuel support pieces.

C. Incorrect since the steam separators increase the steam quality from approximately 13% to 90%.

D. Incorrect since the SBLC system uses the inner tube to inject Boron.

49. 290003K5.02 001

Both Units are operating at 100% RTP. It is reported that the Control Room HVAC can only maintain a positive pressure of 1/5 inch WG relative to the Turbine Building during the pressurization mode. Outside air flow rate is 399 cfm and subsystem flowrate is 2600 cfm.

Based on these plant conditions, which ONE of the following describes the Control Room HVAC system? (Provide copy of TS 3.7.4 with SR's)

A. would still be OPERABLE because Control Room to Turbine Building dp and ventilation flow rates are adequate.

B. would be INOPERABLE because Control Room to outside Turbine Building dp is too low.

C. would be INOPERABLE because the Control Room ventilation subsystem flow rate is inadequate.

D. would be INOPERABLE because outside air flow rate is inadequate.

References: Tech Spec section 3.7.4, MCREC System SR 3.7.4.4
Modified answers to reflect only one correct answer

A. Correct answer since dP is $\geq$ 0.1" wg, subsystem flow rate is $\leq$ 2750 cfm and outside air flow is $\leq$ 400 cfm.

B. Incorrect since the dP is adequate.

C. Incorrect since the subsystem flow rate is adequate.

D. Incorrect since the outside air flowrate is adequate.

50. 295001AK2.07 001

Unit 2 startup is in progress with no equipment out of service. Reactor power is 40% and the speed of both recirc pumps was just raised to 30%. A trip of Recirc Pump "2A" occurs and the operator performs the actions of 34AB-B31-001-2S, *Reactor Recirculation Pump(s) Trip, or Recirc Loops Flow Mismatch* to stabilize the plant.

Which ONE of the following describes how an accurate reading of total core flow is determined under these conditions?

A. Total core flow must be manually calculated by adding "2A" and "2B" Jet Pump Loop flows to obtain an accurate reading.

B. The Total Core Flow indication must be reduced by the "2A" Jet Pump Loop flow to obtain an accurate reading.

C. Total core flow must be manually calculated by subtracting "2A" Jet Pump Loop flow from the "2B" Jet Pump Loop flow to obtain an accurate reading.

D. The summing circuitry for the Total Core Flow indication automatically accounts for the idle "2A" recirc loop and provides an accurate reading.

References: 34AB-B31-001-2S Rev 7.2 pg 3 of 7.
Hatch 99 Exam question #56
Slight modifications to stem and added LOOP to all flows in answers.
Resequenced answers.

A. Correct answer.

B. Incorrect since you cannot subtract the 2A Jet Pump Loop flow from the Total Flow indication and get an accurate reading.

C. Incorrect since you have to add the two loop flows together to get an accurate reading.

D. Incorrect since the summing circuitry does not account for an idle recirc pump.

51. 295002G2.1.2 001

Unit 1 is operating at 550 MWe when the "1A" Circ Water pump trips.

Which ONE of the following actions should be taken by the Operator?

A. Reduce power as necessary to maintain Conderser Vacuum and attemp to restart the "1A" Circ Water pump.

B. Immediately attempt to restart the "1A" Circ Water pump. If the Circ Water pump fails to start, then scram the reactor and close the MSIV's.

C. Immediately attempt to restart the "1A" Circ Water pump. If the Circ Water pump fails to start, then reduce power to less than 450 MWe.

D. Reduce power as necessary to maintain Condenser Vacuum. When condensate demin inlet temperature reaches 140°F, isolate the feed and condensate system.

References: 34AB-N71-001-1S Rev. 4.1
Copy of bank question.

A. Correct answer.

B. Incorrect since the MSIV's are closed if there is no circ water flow.

C. Incorrect since there is not a limit for how far to reduce power as long as condenser vacuum is being maintained.

D. Incorrect since there is no direction to isolate the Condensate System.

52. 295003AK2.01 001

A small LOCA with a LOSS OF OFFSITE POWER occurred on Unit 2 at 0100 on 5/21/02. 600V Bus 2D is being powered from Diesel Generator 2C (Load Shed equipment still **de-energized**) and HPCI is running to maintain reactor vessel water level between -35 and +51.5 inches.

Which ONE of the following predicts how HPCI will respond over the next 3 hours with no operator action?

A. HPCI will continue to operate automatically by maintaining reactor vessel level in a band of -35 inches to +51.5 inches.

B. HPCI will continue to operate automatically by maintaining reactor vessel level between +51.5 inches and the high level reset setpoint.

C. HPCI will operate until it reaches +51.5 inches and will not operate again until the operator depresses the High Level Reset pushbutton.

D. HPCI will continue to operate for approximately 2 hours by cycling between +51.5 inches and -35 inches and then it will fail to operate.

References: SI-LP-00501 Rev. 01 pg 14 - 16 of 46
FSAR Section 8.3.2.1.1, 125/250 VDC Station Battery Power System

A. Incorrect since HPCI will not operate after approximately 2 hours.

B. Incorrect since HPCI will not cycle between 51.5 inches and the reset setpoint. It requires manual action to start HPCI at the reset setpoint.

C. Incorrect since HPCI will automatically start again when level drops to -35".

D. Correct answer.

53. 295004AK3.03 001

Unit 2 is operating at 45% RTP when a loss of DC power causes the following:

Main Turbine trip
Reactor Scram and both Recirc pumps trip
125/250V BATTERY VOLTS LOW alarm

Which ONE of the following losses will most likely cause this transient?

A. 125 VDC Cabinet "2B", 2R25-S002.

B. 125 VDC Cabinet "2D", 2R25-S004.

C. 125/250 VDC Switchgear 2A, 2R22-S016.

D. 125/250 VDC Switchgear 2B, 2R22-S017.

References: LT-LP-02704 Rev. 03. pg 37 - 39 of 61
LT-LP-02704 Rev. 03. pg 50 - 55 of 61
EO 200.018.a.01

Changed initial conditions slightly and changed 2 distractors because it is likely that everyone knows that 24/48 VDC systems are mainly for neutron monitoring systems.

A. Incorrect since this Cabinet is powered by Switchgear 2A and it doesn't cause all of these things to happen.

B. Incorrect since this Cabinet affects DC control power and DG loads.

C. Correct answer.

D. Incorrect since this affects HPCI and Core Spray.

54. 295005AA1.05 001

Unit 2 was operating at 100% RTP when the reactor scrammed due to a turbine trip from high vibrations.

Which ONE of the following describes the correct turbine valve response?

A. Turbine Stop Valves - Closed
Turbine Control Valves - Closed
Intercept Valves - Closed
Intermediate Stop Valves - Open
Bypass Valves - One or more may be open depending on throttle pressure

B. Turbine Stop Valves - Closed
Turbine Control Valves - Open
Intercept Valves - Closed
Intermediate Stop Valves - Closed
Bypass Valves - All open initially; close to control Rx pressure.

C. Turbine Stop Valves - Closed
Turbine Control Valves - Closed
Intercept Valves - Open
Intermediate Stop Valves - Closed
Bypass Valves - One or more may be open depending on throttle pressure

D. Turbine Stop Valves - Closed
Turbine Control Valves - Closed
Intercept Valves - Closed
Intermediate Stop Valves - Closed
Bypass Valves - All open initially; close to control Rx pressure.

References: SI-LP-01901-00 Rev. 3 pg 44-46 of 79
SI-LP-01701-00 Rev. SI-00 pg 17 of 36
EO 019.010.a.01

A. Incorrect since all valves close except bypass valves on a turbine trip from Hi vibes.

B. Incorrect since all valves close except bypass valves on a turbine trip from Hi vibes.

C. Incorrect since all valves close except bypass valves on a turbine trip from Hi vibes.

D. Correct answer.

55. 295006AK3.01 002

Unit 2 was operating at 100% RTP when a scram occurred from a spurious Group 1 isolation.

Which ONE of the following describes the expected initial Reactor Water Level response and the reason for that response? (Assume no operator actions occur)

A. Reactor water level will decrease due to collapsing of voids and then will increase due to feedwater injection.

B. Reactor water level will increase due to feedwater injection still at 100% and then will decrease due to level setpoint at scram setpoint.

C. Reactor water level will decrease due to feedwater level control at scram setpoint and then increase due to Startup Level Control Valve (SULCV) leakby.

D. Reactor water level will decrease due to SRV's opening and then will increase due to feedwater injection.

Reference: FSAR 15.2.3.6.2.1

A. Correct answer. Voids collapse due to initial pressure transient.

B. Incorrect since level initially decreases from collapsing of voids.

C. Incorrect since level is below the scram setpoint for feedwater from the initial void collapse.

D. Incorrect since level initially increases from swell.

56. 295007AA1.04 001

Unit 1 scrammed due to a Group 1 isolation from high main steam line flow. The following conditions exist:

All rods inserted	
Reactor Pressure	1090 psig
Reactor Water Level	+54 inches
Drywell Pressure	1.5 psig
Torus Level	150 inches

The operator has opened SRV 1B21-F013G to lower reactor pressure.

Which ONE of the following describes how reactor pressure will be controlled after the operator closes SRV 1B21-F013G?

A. Reactor pressure will be automatically controlled by the EHC system using the Turbine Bypass Valves.

B. Reactor pressure will be manually controlled by the operator using HPCI with a suction from the condensate storage tank.

C. Reactor pressure will be automatically controlled by the Low Low Set system between 847 and 1033 psig.

D. Reactor pressure will be manually controlled using the Reactor Feed Pump turbines.

References: 34AR-603-114-1S Rev. 6, Reactor High Pressure
RC RPV CONTROL (NON-ATWS) Rev. 7
SI-LP-01401 Rev. 00 Table 4
SI-LP-00501 Rev. 01 Table 6

A. Incorrect since the MSIV's are closed from a valid isolation signal and cannot be reopened.

B. Incorrect since HPCI cannot be used due to high water level isolation signal.

C. Correct answer.

D. Incorrect since the MSIV's are closed from a valid isolation signal and cannot be reopened.

57. 295008AK3.01 001

Which ONE of the following is the reason that the Main Turbine receives a trip signal if the RPV experiences a high water level condition?

A. Protects the turbine from damage due to water entering the turbine.

B. Protects the main steam piping from damage due to water hammer.

C. Initiates an anticipatory reactor scram due to the simultaneous trip of the reactor feedwater pump.

D. Protects the turbine control and stop valves from damage due to water impingement.

Reference: Tech Spec Bases B 3.3.2.2, Feedwater and Main Turbine High Water Level Trip Instrumentation (Background).

A. Correct answer.

B. Incorrect since the turbine trip may cause water hammer in piping due to stop valves going closed.

C. Incorrect since the turbine trip does not perform an anticipatory scram function.

D. Incorrect since the valves closing may be subject to water hammer if the water level continues to increase.

58. 295009AK1.05 002

Which ONE of the following is the main reason that RPV level is lowered during an ATWS condition?

A. Reduce reactor power by reducing the natural circulation driving head.

B. Reduce steam generation rate which reduces the moderator temperature.

C. Prevent thermal stratification which prevents localized power peaks.

D. Reduce reactor pressure which allows more injection from low pressure systems.

Reference: LR-LP-20327 Rev. 10 Pg 42 of 53
Revised correct answer IAW lesson plan.

A. Correct answer.

B, C or D. Incorrect answer.

59. 295009G2.4.1 001

Unit 2 has scrammed with a failure of all the control rods to insert. The following plant conditions exist:

Rx Power	8%
Rx Water Level	-50"
Drywell Pressure	3.5 psig
Torus Pressure	3.0 psig
Torus Temperature	141°F

LLS is armed
ADS is Inhibited

Which ONE of the following is an acceptable order from the Shift Supervisor?
(Distribute copy of BIIT Curve Graph 5)

A. Maintain RWL between -60" and +50" using Condensate and Feedwater.

B. Terminate and prevent all injection except Boron, CRD and RCIC until RWL is below -60".

C. Terminate and prevent all injection except Boron, CRD and RCIC until RWL is below -60" and Rx Power remains below 5% OR RWL is at -155" OR DW press is <1.85 psig and SRV's remain closed and RWL is below -60".

D. Restore and maintain RWL between +3" and +50" using HPCI with a suction from the Condensate Storage Tank.

Reference: CP-3 ATWS Level Control
RC RPV Control
LR-20328 Rev. 06 RPV Control ATWS (RCA)

A. Incorrect since the overide conditions above this step have been met which send you to a terminate and prevent leg.

B. Incorrect since you meet all of the requirements for the overide to send you to another terminate and prevent leg.

C. Correct answer.

D. Incorrect since these actions are in RC RPV Control and not in the CP-3 ATWS Level Control procedure.

60. 295010AA2.02 001

Unit 1 has scrammed due to high Drywell pressure. Torus Spray is INOPERABLE and Drywell Spray was initiated per the EOP's. The following conditions presently exist:

Reactor Water Level	-135 inches and increasing
Torus level	136 inches and stable
Torus temperature	125°F and increasing
Torus pressure	.5 psig and increasing
Drywell average temperature	145°F and increasing
Drywell pressure	-.5 psig and increasing

Based on the above plant conditions, which ONE of the following describes Drywell Spray operation?

A. SHOULD NOT be in operation because Drywell pressure is below 0 psig.

B. SHOULD be in operation until Torus pressure reaches 0 psig.

C. SHOULD NOT be in operation because Drywell pressure is below the EOP entry condition.

D. SHOULD be in operation because a PC-1 Primary Containment Control entry condition still exists.

References: PC-1 Primary Containment Control

A. Correct answer.

B. Incorrect since Drywell Sprays should be isolated before Drywell pressure reaches 0 psig.

C. Incorrect since Drywell Sprays are not governed by the EOP entry conditions but by the Primary Containment Pressure leg of the EOP's.

D. Incorrect since Drywell Sprays should be isolated before Drywell pressure reaches 0 psig per the overide in EOP's.

61. 295012AA1.02 001

Unit 1 is operating at 50% RTP with all Drywell cooling units in AUTO. The following conditions exist in the Drywell :

CRD cavity area temperature	155°F
Recirc pump motor area	135°F
Vessel upper head area	178°F
Drywell average air temperature	149°F

Which ONE of the following describes which Drywell cooling fans should receive an auto start signal and which parameter provided that signal?

A. Fans B007A, B007B, B009A and B009B due to vessel upper head area high temperature.

B. Fans B007A, B007B, B008A and B008B due to CRD cavity area high temperature.

C. Fans B007A, B007B, B008A and B008B due to vessel upper head area high temperature.

D. Fans B008A, B008B, B009A and B009B due to Drywell average air high temperature.

References: SI-LP-01304 Rev. 01, pg. 16 & 17 of 53

A. Incorrect since drywell cooling fans do not start on vessel upper head area high temperature.

B. Correct answer.

C. Incorrect since drywell cooling fans do not start on vessel upper head area high temperature.

D. Incorrect since drywell cooling fans do not start on Drywell high average air temperature.

62. 295013AK1.03 001

Unit 1 is operating at 75% RTP with Safety Relief Valve (SRV) "G" leaking to the Suppression Pool. All attempts to reseat the valve have failed. One RHR loop is operating in the Suppression Pool Cooling mode with Suppression Pool temperature at 111°F and increasing very slowly.

Which ONE of the following actions would the crew be expected to take?

A. Maximize torus cooling by placing the other RHR loop in operation and continue operating.

B. Depressurize the RPV to less than 200 psig within 12 hours.

C. Reduce THERMAL POWER until all OPERABLE IRM channels ≤ 25/40 divisions of full scale on Range 7 within 12 hours.

D. Place the reactor Mode Switch in the shutdown position immediately.

References: LR-LP-20201-13
Tech Spec Section 3.6.2.1 Suppression Pool Average Temperature
PC-1 Primary Containment Control

A. Incorrect since this action should have already been performed per PC-1 when Torus temperature went above 100°F.

B. Incorrect since this is the Tech Spec action if Torus temperature is ≥ 120°F.

C. Incorrect since this is the Tech Spec action if Torus temperature cannot be restored to ≤ 100°F within 24 hours but it is no longer applicable since the Condition has been exited when the temperature went >110°F.

D. Correct answer per Tech Spec 3.6.2.1 Condition D.

63. 295013AK3.01 001

Unit 2 is operating at 100% RTP. The quarterly HPCI Flow Rate Test was just suspended with the following plant conditions:

Torus Cooling	Both loops in operation
Torus Temperature	105°F and increasing
Torus Level	149" and decreasing

Which ONE of the following describes the reason for suspending adding heat to the Suppression Pool per Tech Spec section 3.6.2.1?

A. Ensures primary containment design limits are not exceeded in the event of a LOCA.

B. Preserves heat absorption capabilities of the suppression pool.

C. Ensure PCPL is not reached in the event of an emergency depressurization.

D. Ensure HCTL is not reached in the event of a LOCA.

References: Tech Spec Bases 3.6.2.1

A. Incorrect since this is the reason for actions at 120°F.

B. Correct answer.

C. Incorrect since this is the basis for HCTL.

D. Incorrect since this is not a basis for suppression cooling action.

64. 295014AK2.03 001

Which ONE of the following describes the Abnormal Operating Occurances (Plant Transients) which increase fuel temperature?

A. Recirc Flow Control Failure-Increasing Flow, Loss of Feedwater Heating, Inadvertent start of HPCI.

B. Loss of Shutdown Cooling, Loss of Condenser Vacuum, Recirc Flow Control Failure-Decreasing Flow.

C. Loss of Feedwater Heating, Trip of one Recirc Pump, Startup of idle Recirc Pump.

D. Recirc Flow Control Failure-Increasing Flow, Loss of Condenser Vacuum, Turbine Trip with Bypass Valves available.

References: FSAR section 15.2

A. Correct answer - all occurances increase reactor power and fuel temperature.

B, C and D. Incorrect since at least one occurance decreases reactor power and fuel temperature.

65. 295015AA2.01 001

During an ATWS on Unit 2 the Operator performing RC-2 fails to close 2N21-F110, SULCV Bypass. RPV pressure subsequently drops to 400 psig with all injection systems still available.

Which ONE of the following describes the potential adverse consequences of this condition?

A. Core Spray injection will occur diluting boron flow.

B. Level will decrease and the MSIV's may close causing a loss of the main condenser and heat sink.

C. A significant power excursion could occur due to uncontrolled injection to the RPV.

D. Boron mixing will be prevented due to less flow in the downcomer.

References: LR-LP-20305 Rev. 04 pg 17 and 18 of 24

A. Incorrect since Core Spray will not dilute boron flow and Core Spray should not be injecting at 400 psig.

B. Incorrect since level will increase with this valve open.

C. Correct answer.

D. Incorrect since leaving this valve unisolated will not prevent Boron mixing.

66. 295016AK3.01 001

There is an electrical fire in the Control Room and black smoke has made the Control Room inaccessable. If possible, prior to leaving the Control Room the Reactor Operator inserts a manual Scram per *31RS-OPS-001-1S, Shutdown from Outside Control Room.*

Which ONE of the following describes why the procedure also has steps to Scram the reactor by de-energizing RPS or actuating the Scram Discharge Volume level switches?

A. The Technical Specifications require that Reactor Scram capability from outside the Control Room be maintained.

B. The FSAR requires the ability for prompt hot shutdown of the reactor from locations outside the Control Room.

C. The Technical Requirements Manual requires the capability to Scram the reactor from outside the Control Room.

D. The capability for prompt hot shutdown of the reactor from outside the Control Room is not required but is a safe operating practice.

References: HNP-2-FSAR-3 pg 3.1-16 and 17.
HNP-2-FSAR-7 pg 7.5-5 thru 7.5-10.
Procedure 31RS-OPS-001-1S Rev. 3

A. Incorrect since Technical Specifications do not describe how to shutdown the plant from outside the control room.

B. Correct answer.

C. Incorrect since the Technical Requirements Manual does not describe how to shutdown the plant from outside the control room.

D. Incorrect since it is a requirement to be able to perform a prompt hot shutdown from outside the control room.

67. 295018AK2.02 001

Unit 1 is in the process of increasing to full load after a refueling outage when a complete loss of stator cooling occurs. The following conditions existed just prior to the loss of stator cooling:

Generator output	650 MWe
Stator current	17000 amps
Stator cooling disch press	90 psig
Stator cooling conductivity	.5 micro mho

Which ONE of the following is the appropriate plant response?

A. The turbine will immediately trip causing a reactor scram.

B. The turbine will trip if it does not complete a runback to less then 24% load in two minutes.

C. The turbine will trip if stator amps are not less than 4500 amps within 3.5 minutes.

D. The turbine will trip if stator amps are not less than 15,000 amps within two minutes and less than 4500 amps within 3.5 minutes. (total time = 3.5 minutes)

References: SI-LP-02301 Rev. SI-00, pg 13 of 21
EO 023.001.c.05

A. Incorrect since a complete loss of stator cooling does not cause an immediate turbine trip.

B. Incorrect since the runback does not need to be complete until 3.5 minutes have elapsed. Initial amps are less than 19080 so the 2 minute timer does not start.

C. Correct answer.

D. Incorrect since 2 minute timer is not in effect.

68. 295020G2.1.20 001

Unit 2 is at 100% RTP with the I & C Technicians in the process of performing the quarterly Main Steam Line Flow - High functional surveillance. The unit scrams due to a Group 1 isolation.

Which ONE of the following actions are required to be performed to reset the GROUP 1 signal?

A. Confirm all Group 1 valves are closed. Shift Supervisor determines that signal was spurious since I & C Techs were performing a Group 1 surveillance and orders CBO to reset the Group 1 signal.

B. Confirm all Group 1 valves are closed. CBO places all MSIV control switches to 'closed'. Shift Supervisor stops I & C surveillance and verifies Group 1 signal is spurious by checking associated parameters and orders CBO to reset the Group 1 signal.

C. Shift Supervisor stops I & C surveillance and ensures all equipment is back to normal. Shift Supervisor verifies Group 1 signal is spurious by checking associated parameters including radiation monitors and orders CBO to reset the Group 1 signal.

D. Confirm that the Group 1 isolation was valid. Do not reset the Group 1 isolation until the plant enters Mode 4 where the instrumentation is not required to be OPERABLE.

References: 34AR-603-208-2S Rev. 4.2
Tech Spec 3.3.6.1, Primary Containment Isolation Instrumentation

A. Incorrect since the MSIV's are required to have a closed signal applied with the control switches prior to reseting the isolation signal.

B. Correct answer.

C. Incorrect since the Operators must verify isolation occurred properly and also give a closed signal to the MSIV's prior to resetting isolation signal.

D. Incorrect since the cause of the Group 1 was spurious and you do not need to wait for Mode 4 to reset the Group 1 since nothing is INOPERABLE.

69. 295021AK2.05 001

The following conditions exist on Unit 1:

Reactor is in Condition 5
"B" RHR Pump in Fuel Pool Cooling Assist
Reactor cavity is flooded
Fuel Pool gates are removed
Fuel shuffle has just been completed

The supply breaker to 1B RHR Pump has tripped and cannot be reclosed. Fuel Pool temperature starts to increase.

Which ONE of the following is the most appropriate action to lower Fuel Pool temperature?

A. Place the "A" RHR Pump in Fuel Pool Cooling Assist.

B. Feed the Unit 1 Fuel Pool by opening 1G41-F041, Spent Fuel Pool Make-up from CST.

C. Place the "D" RHR Pump in Fuel Pool Cooling Assist.

D. Remove the transfer canal gates and feed the Unit 2 Fuel Pool by opening 2G41-F054, Spent Fuel Pool Make-up from CST.

References: Procedure 34AB-G41-001-1S Rev. 2, Loss of Fuel Pool Cooling pg 2 & 3 of 12.
Procedure 34SO-E11-010-2S Rev. 30.3, Residual Heat Removal System pg 65 of 238.
Procedure 34AB-E11-001-1S Rev. 3, Loss of Shutdown Cooling pg 4 of 19.

A. Incorrect since "A" RHR Pump cannot be used for Fuel Pool Cooling Assist.

B. Incorrect since feeding the Unit 1 Fuel Pool is allowed when there are no other means of cooling available.

C. Correct answer.

D. Incorrect since feeding the Unit 2 Fuel Pool is allowed when feeding Unit 1 Fuel Pool cannot be established.

70. 295022G2.1.30 001

Unit 2 CRD pump B has been started from the Remote Shutdown Panel. A System Operator (SO) checking the status of the CRD pump reports the following:

CRD Pump B is running.
CRD Pump B suction valve is closed.
CRD Pump B discharge pressure is about 200 psig.
CRD Pump B suction pressure is downscale.

Which ONE of the following describes how the CRD pump should have responded?

A. SHOULD have started but auto tripped on low suction pressure.

B. SHOULD have started but auto tripped on low discharge pressure.

C. SHOULD NOT have auto tripped because the low suction pressure trip is presently bypassed.

D. SHOULD NOT have auto tripped because the low discharge pressure trip is presently bypassed.

References: SI-LP-05201-00 Rev. 00 Table 8
SI-LP-00101-00 Rev. SI-00 pg 15-17 of 46

A. Correct answer.

B. Incorrect since the CRD pump doesn't have a trip for low discharge pressure.

C. Incorrect since the CRD pump should have tripped on low suction pressure. The LOCA pump trip is bypassed when taking the RSP switch to Emergency and not the low suction pressure trip.

D. Incorrect since the CRD pump should have tripped on low suction pressure. The CRD pump doesn't have a low discharge pressure trip.

71. 295023AK1.03 001

The refueling process (i.e. core offload/reload sequence, moving one component at a time, SRO supervising all core alterations, etc.) is designed to prevent an inadvertent criticality.

Which ONE of the following is used as a backup to the refueling process to prevent an inadvertent criticality?

A. Secondary Containment is OPERABLE.

B. Standby Liquid Control is OPERABLE.

C. Refueling Interlocks.

D. Mode Switch locked in REFUEL.

References: LT-LP-04502 Rev. 03, pg. 9 of 57.

A. Incorrect since this does not prevent inadvertent criticality but protects site personnel and public from exposure from an accident.

B. Incorrect since SBLC does not prevent inadvertent criticality but it can take care of it once it happens.

C. Correct answer.

D. Incorrect since the Mode Switch in this position will allow a control rod to be withdrawn.

72. 295024EA1.04 002

Unit 2 has experienced a LOCA with the following conditions present:

Reactor is Shutdown	
Reactor water level	-100"
Reactor pressure	550 psig
Drywell pressure	12 psig
Drywell temperature	265°F
Torus pressure	11.5 psig

The Shift Supervisor has ordered initiation of Drywell Sprays.

In accordance with *34SO-E11-010-2S, Residual Heat Removal System*, which ONE of the following is the MINIMUM drywell spray flow rate required to ensure an effective drywell pressure reduction?

A. 700 gpm.

B. 5000 gpm.

C. 7700 gpm.

D. 17000 gpm.

References: PC-1 Primary Containment Control
Procedure 34SO-E11-010-2S Rev. 30.3 pg 71 and 72 of 238

A. Incorrect since this is the value for Torus spray flow.

B. Correct answer.

C. Incorrect since this is the flow rate to maintain ≤ if using one pump for drywell spray.

D. Incorrect since this is the maximum flow rate for the loop.

73. 295025EA1.07 001

Unit 2 is operating at 100% RTP. A turbine trip causes a reactor scram but not all of the turbine Bypass valves open on rising pressure. RPV pressure increases to 1190 psig and reactor water level drops to -32" and is currently increasing.

Which ONE of the following statements correctly describes the response of the Alternate Rod Insertion (ARI) system?

A. ARI WILL automatically initiate due to Rx Low Water Level.

B. ARI WILL NOT automatically initiate until RPV water level decreases further.

C. ARI WILL automatically initiate due to high RPV pressure.

D. ARI WILL NOT automatically initiate until RPV pressure increases further.

References: SI-LP-00101 Rev. SI-00, pg 21 - 24 of 46.
EO 010.024.1.02

A. Incorrect since the low reactor water level setpoint of -35" has not been reached.

B. Incorrect since the high reactor pressure actuation setpoint has already been reached (1170 psig).

C. Correct answer.

D. Incorrect since ARI should have already initiated on high pressure (1170 psig).

74. 295026EK2.04 001

Unit 1 is in Mode 1 with the quarterly HPCI Pump Operability Surveillance in progress. The Suppression Pool average temperature is 102°F. The following signals are being sent to SPDS:

Group 1 signals: 4 out of 5 are operable and reading 102°F.
Group 2 signals: 5 out of 5 are operable and reading 103°F.
Group 3 signals: 4 out of 5 are operable and reading 102°F.

Which ONE of the following conditions describes the SPDS indication?

A. Green box with the average temp indicated since average temp is <105°F.

B. Yellow box with the average temp indicated since all groups have a signal.

C. Yellow box with no temp indicated since all signals are not operable.

D. Red box with the average temp indicated since average temp is >100°F.

Reference: LT-LP-05601 Rev. 03 Safety Parameter Display System
EO 056.002.c.03

A. Incorrect because the average temp must be <100°F to be green.

B. Incorrect because there are 2 or more imputs to each group and temp is > 100°F so the box should be red.

C. Incorrect because there are 2 or more imputs to each group and temp is > 100°F so the box should be red.

D. Correct answer since average temp > 100°F and there are 2 or more inputs to each group.

75. 295028EK1.02 001

Which ONE of the following is the basis for initiating drywell sprays before the bulk drywell temperature reaches the drywell design temperature limit?

A. To prevent increased degredation of structural concrete and release of hydrogen to the drywell.

B. To maintain the equipment qualification of the drywell valves above the 185' elevation, capable of removing the full decay heat load following a LOCA.

C. To ensure that equipment within the drywell will operate when required.

D. To ensure that the capacity of the suppression chamber - drywell vacuum breakers is not exceeded.

Reference: LR-LP-20310-05, p. 59
99 exam question #15 (answers reordered)

A. Incorrect since elevated Drywell temperature has no effect release of Hydrogen to the containment.

B. Incorrect since initiating drywell sprays has no effect on equipment qualification.

C. Correct answer.

D. Incorrect since drywell temperature does not affect the capacity of the suppression chamber to drywell vacuum breakers.

76. 295029EK1.01 001

In accordance with *PC-1 PRIMARY CONTAINMENT CONTROL*, drywell sprays cannot be initiated unless torus level is below 215 inches.

Which ONE of the following describes the reason for this restriction?

A. The suppression pool-to-reactor building vacuum breaker connections are submerged preventing their operation if needed.

B. The drywell-to-suppression pool vacuum breakers are submerged which may cause the containment differential pressure capability to be exceeded.

C. The suppression pool-to-reactor building vacuum breaker connections are submerged and containment integrity would be lost when they open.

D. The drywell-to-suppression pool vacuum breakers are submerged allowing suppression pool water to be siphoned into the drywell.

References: LR-LP-20310 Rev. 05, pg. 31 of 96
EO 201.072.a.27, 201.073.a.06, 201.075.b.15, 201.076.a.14

A. Incorrect since 215" is concerned with covering the drywell-to-suppression pool vacuum breakers.

B. Correct answer.

C. Incorrect since 215" is concerned with covering the drywell-to-suppression pool vacuum breakers.

D. Incorrect since covering the vacuum breakers would not result in siphoning water to the drywell.

77. 295030EK3.03 001

Per the EOP's HPCI is required to be tripped on lowering Torus level but RCIC is allowed to continue to operate if necessary.

Which ONE of the following describes why RCIC operation with lowering Torus level is acceptable?

A. The exhaust flow rate of RCIC is approximately equal to decay heat and a low Torus level will cause RCIC to trip on low suction pressure.

B. Elevated Torus pressure will cause RCIC to trip much sooner than HPCI and Emergency Depressurization is required before the exhaust line is uncovered.

C. Low Torus level will cause RCIC to trip on low suction pressure and Emergency Depressurization is required before the exhaust line is uncovered.

D. Elevated Torus pressure will cause RCIC to trip much sooner than HPCI and the exhaust flow rate of RCIC is approximately equal to decay heat.

References: LR-LP-20310 Rev. 05, pg. 23 of 96

A. Incorrect since low torus level will not affect RCIC suction trip since it is set at 10" Hg vacuum.

B. Incorrect since Emergency Depressurization is not required before RCIC exhaust line is uncovered.

C. Incorrect since low torus level will not affect RCIC suction trip since it is set at 10" Hg vacuum and Emergency Depressurization is not required before RCIC exhaust line is uncovered.

D. Correct answer.

78. 295032EK3.03 001

The SC-SECONDARY CONTAINMENT CONTROL EOP requires Emergency Depressurization if 2 or more areas exceed the Maximum Safe Operating Temperature and a primary system is discharging reactor coolant into secondary containment.

Which ONE of the following statements explain the reason for this action?

A. The rise in secondary containment parameters indicate a wide-spread problem which may pose an indirect but immediate threat to secondary containment integrity or continued safe operation of the plant.

B. The rise in secondary containment parameters indicate substantial degredation of the primary system and may lead to fuel failure if the leaks are not isolated.

C. ✓ The rise in secondary containment parameters indicate a wide-spread problem which may pose a direct and immediate threat to secondary containment integrity or equipment located in secondary containment.

D. ✓ The rise in secondary containment parameters indicate substantial degredation of the primary system and emergency depressurization places the plant in the safest condition as quickly as possible.

References: LR-LP-20325 Rev. 05, pg 19 and 20 of 40
EO 201.077.a.14, 201.078.a.15, 201.079.a.19

A. Incorrect since condition pose a DIRECT threat to containment, not an INDIRECT threat.

B. Incorrect since this condition does not indicate substantial primary system degredation.

C. Correct answer.

D. ~~Incorrect since this condition does not indicate substantial primary system degredation~~. Additional correct answer - due to post exam comment. ROO 11/21/02

79. 295036EA1.02 001

The following conditions exist on Unit 2:

-Sump alarms in the Control Room indicate a leak in the Southwest Diagonal Area of the Reactor Building.
-The plant operator reports water level is 15" above 87' elevation and increasing.
-The source of the leak has been identified as a fire protection pipe in the room.
-No increase in area temperature or radiation has been noted.
-No other emergency condition exists at this time.

In accordance with SC-SECONDARY CONTAINMENT CONTROL EOP, which ONE of the following actions is appropriate?
(Provide copy of SC-SECONDARY CONTAINMENT CONTROL EOP)

A. Shutdown the reactor per the Fast Shutdown procedure.

B. Install a submersible pump to lower level; do not isolate the fire system.

C. Declare the affected systems INOPERABLE and enter appropriate Tech Spec.

D. Isolate the fire system header discharging into the area.

References: SC - Secondary Containment Control

A. Incorrect since the reactor isn't required to be shutdown until area water level in more than one area is above max safe.

B. Incorrect since the system discharging into the affected area must be isolated with some exceptions. These exceptions are not met.

C. Incorrect since the systems are not required to be declared INOPERABLE just because the area water level is above max normal.

D. Correct answer since level cannot be restored to normal with the leak in progress.

80. 295037EK2.05 001

Unit 2 has scrammed due to low reactor water level. Multiple control rods did not insert and the ATWS procedure is being directed by the Shift Supervisor. The Shift Supervisor has ordered the RO to insert control rods by increasing CRD cooling water differential pressure (dp).

Which ONE of the following describes how this action causes control rods to insert?

A. Increased cooling water dp puts additional pressure on the underside of the CRDM drive pistons.

B. Increased cooling water dp puts additional pressure on the top of the CRDM drive pistons.

C. Increased cooling water dp causes driving flow to increase.

D. Increased cooling water dp causes driving flow to decrease.

Reference: LR-LP-20314 Rev. 03 pg 13
EO 001.034.a.01

A. Correct answer.

B. Incorrect. Additional pressure is placed on the underside of the drive piston.

C. Incorrect answer. Increasing cooling water Dp has no effect on drive flow.

D. Incorrect answer. Increasing cooling water Dp has no effect on drive flow.

81. 295037EK3.02 001

An ATWS has occurred on Unit 2 and RCIC is being used to inject boron. The RCIC Minimum Flow Valve F019, has been closed and system flow has been verified to be greater than 122.5 gpm. The Minimum Flow Valve's breaker was then opened to prevent operation of the valve.

Which ONE of the following describes the reason that the Minimum Flow Valve was disabled?

A. Ensure that the RCIC pump does not go to run out if the Minimum Flow Valve stuck in the open position.

B. Ensure that all boron flow is to the Vessel and not to the Suppression Pool.

C. Ensure that all boron flow is to the Vessel an not to the CST.

D. Ensure that the RCIC pump has the proper amount of cooling flow.

References: LR-LP-20320 Rev. 05, pg. 22 of 28.
SI-LP-03901 Rev. 00, Figure 1
EO 039.019.a.11, 039.020.a.07

Changed answer D to relate to pump minimum flow requirements.

A. Incorrect since RCIC minimum flow valve would still operate at the appropriate setpoints.

B. Correct answer.

C. Incorrect since the minimum flow valve goes back to the Torus.

D. Incorrect since the amount of flow is what protects the pump from overheating and not whether the minimum flow valve is deactivated.

82. 295038EA2.03 002

Which ONE of the following describes the basis for an offsite radioactivity release rate of 0.57 mr/hr as an entry condition to Radioactive Release Control (RR)?

A. Represents an immediate threat to the continued health and safety of the public.

B. Corresponds to an entry into a Site Area Emergency in the Emergency Plan.

C. Indicates a primary system break which cannot be isolated.

D. Represents a release rate that is higher than expected during normal plant operations but does not pose an immediate threat to the public.

Reference: LR-LP-20325 Rev. 05, pg 26,29
EO 201.082.a.09

A. Incorrect answer. This is a bases for the 1000 mr/hr entry to RCA.

B. Incorrect since .57 corresponds to an alert action level.

C. Incorrect answer. This is a bases for the 1000 mr/hr entry to RCA.

D. Correct answer.

83. 295038EK2.03 001

As a result of maintenance the control room ventilation system is aligned to the Isolation Mode. A subsequent off-site release resulted in the initiation of a Main Control Room air intake high radiation signal.

Which ONE of the following describes the impact the high radiation signal has on the continued operation of the Control Room HVAC System?

A. Since the control room ventilation system is not in the Normal Mode then the Control Room Operator must manually initiate the Pressurization Mode per *34SO-Z41-001-1S, Control Room Ventilation System.*

B. The Control Room Ventilation System will remain in the Isolation Mode until the high radiation signal clears. Then the Control Room Operator must realign the system to the Normal Mode.

C. 1Z41-F016, Outside Air Intake Damper will automatically open along with the filter inlet valves. This will place the Control Room Ventilation System in the Pressurization Mode to protect the Control Room personnel.

D. The Control Room Ventilation System will automatically shift to the Purge Mode. The Control Room Operator must start the exhaust fan and ensure 1Z41-F018A(B), Suction Damper is open.

References: INPO exam bank (Fermi)
34SO-Z41-001-1S Rev. 17 pg 8 - 12 of 33

A. Incorrect since the Control Room HVAC System will automatically shift to the Pressurization Mode upon high inlet radiation levels.

B. Incorrect since the Control Room HVAC System will automatically shift to the Pressurization Mode upon high inlet radiation levels.

C. Correct answer.

D. Incorrect since the Control Room HVAC System will automatically shift to the Pressurization Mode upon high inlet radiation levels.

84. 300000K6.12 001

Unit 1 is in cold shutdown with repairs being performed on the 1B Recirc Pump seals. The inboard MSIV's are being stroked for surveillance purposes to determine closing times. A LOSP has occurred and the supply breakers have tripped on undervoltage for the Station Service Air Compressors (SSAC's).

Which ONE of the following describes how this will affect the ability to stroke the inboard MSIV's on Unit 1?

A. ✓ They have failed closed due to the loss of motive force as the Station Service Air Receivers bleed down.

B. They may still be operated normally since the Backup Nitrogen Supply valve automatically opens at 90# pressure to supply the motive force.

C. They may each be operated once after the Emergency Nitrogen Supply bottles are valved in manually.

D. They may still be operated normally since the normal nitrogen makeup is supplying the motive force to operate the valves.

References: LT-LP-03501-03 Rev. 03 pg 49 of 97
LT 03501 Fig. 03
EO 200.025.a.01

A. Correct answer since the Drywell is de-inerted for ongoing work and nitrogen is not available to operate the valves.

B. Incorrect since this supply is isolated when the drywell is de-inerted.

C. Incorrect since this supply is isolated when the drywell is de-inerted.

D. Incorrect since these bottles cannot be lined up to supply the MSIV's.

85. 400000A4.01 001

Unit 1 is operating at 100% RTP with the following lineup for RBCCW pumps:

"A" RBCCW Pump	Running
"B" RBCCW Pump	Running
"C" RBCCW Pump	Auto not running

Which ONE of the following is the expected plant response from a trip of 4160V Bus 1G assuming no operator action is taken?

A. No change is plant status as the "C" RBCCW pump has lost power but was not running.

B. "A" RBCCW pump trips; "C" RBCCW pump cannot start due to a loss of power; Recirc pump, RWCU NRHX outlet, and CRD pump temperatures increase; Recirc pumps trip due to Recirc M-G set high oil temperatures.

C. "B" RBCCW pump trips; "C" RBCCW pump auto starts at 90 psig system pressure; Recirc pump, RWCU NRHX outlet, CRD pump and Recirc M-G set oil temperatures do not measurably change.

D. "A" AND "B" RBCCW pumps trip; "C" RBCCW pump auto starts at 90 psig; Recirc pump, Recirc M-G set, RWCU NRHX outlet and the running CRD pump temperatures increase; Recirc M-G set and CRD pumps eventually trip on high temperatures.

References: LT-LP-02703-03 Rev. 03 pg 48-49 of 63.
SI-LP-00901-00 Rev SI-00 pg 13 of 25
EO 200.014.a.05

A. Incorrect since the "C" RBCCW pump auto starts to maintain RBCCW system pressure.

B. Incorrect since the "B" RBCCW pump is the one that trips.

C. Correct answer.

D. Incorrect since the loss of the 2G Bus does not affect the "A" RBCCW pump.

86. 500000EA1.01 001

After a scram on Unit 2, Reactor Water Level decreases to 0" before being restored to the normal band. When a high Drywell temperature is observed the Shift Supervisor enters the Primary Containment flowcharts. The Shift Supervisor directs H_2O_2 Analyzers to be placed in service.

Which ONE of the following is required to start the H_2O_2 Analyzers?

A. No action is required since the H_2O_2 Analyzers should be running due to an automatic start signal.

B. Depress the H_2O_2 analyzer reset pushbuttons on the 2H11-P700 panel.

C. Place the 2P33-S16/S17 LOCA OVERRIDE switches in Bypass on the 2H11-P700 panel.

D. Place the 2P33-S25(B)A mode switches in ANALYZE on the 2P33-P601B(A) panels.

References: 34SO-P33-001

A. Incorrect since the analyzers do not have an auto start signal.

B. Incorrect since the isolation signal is present and it must be bypassed, action would otherwise be correct.

C. Correct answer.

D. Incorrect since the isolation signal is present ain it must be bypassed, otherwise the action would be correct.

87. 600000AA2.06 001

A fire has been reported outside the Turbine Building which is producing large amounts of smoke. The Fire Brigade has been dispatched and the Brigade Leader reports back that the fire is under control. He also expresses a concern that the Control Room may get smoke drawn into the ventilation.

Per *34AB-X43-001-2S, Fire Procedure*, which ONE of the following describes the action the Control Board Operator (CBO) should take?

A. Place the control room ventilation system in the Purge mode.

B. Maintain the control room ventilation in the normal lineup until the fire is out.

C. Place the control room ventilation system in the isolation mode.

D. Secure control room ventilation until the fire is out and the smoke clears.

References: 34AB-X43-001-2S, Fire Procedure Rev. 10 ED 6, pg 2 of 77.

A. Incorrect since the purge mode will draw in more outside air.

B. Incorrect since this lineup still draws in outside air.

C. Correct answer per step 4.6.

D. Incorrect since the control room ventilation system should not be secured under these circumstances.

88. G2.1.10 001

Which ONE of the following is the maximum power level authorized for Unit 2 operation in accordance with Tech Specs?

A. 897 MWe

B. 943 MWe

C. 2763 MWt

D. 2816 MWt

References: Tech Specs Section 1.1 pg 1.1-4.
99 Hatch exam question #9

A. Incorrect since MWe is not discussed in the license.

B. Incorrect since MWe is not discussed in the license.

C. Correct answer.

D. Incorrect since wrong number.

89. G2.1.2 001

Unit 1 has just declared a General Emergency due to offsite radioactivity release rates reaching 1000mR/hr.

Which ONE of the following describes the appropriate duties that would be performed by the Control Room Reactor Operator?

A. Perform offsite dose assessment calculations as appropriate.

B. Activate the Emergency Response Teams and establish communications with the NRC.

C. Complete the Emergency Page Announcement Guide as appropriate and initiate site evacuation per the Emergency Plan.

D. Assist the Emergency Director with protective action recommendations and take actions to mitigate the consequences of the event.

References: 73EP-EIP-005-0 Rev. 6 pg 3-7 of 8.

A. Incorrect since the Control Room Operator doesn't activate the Emergency Response Teams.

B. Correct answer.

C. Incorrect since the Control Room Operator doesn't initiate site evacuation.

D. Incorrect since the Control Room Operator doesn't perform protective action recommendations.

90. G2.1.29 001

During a valve lineup, an operator needs to check a valve in the throttled position. It is noted that the valve has a locking device installed.

Which ONE of the following describes the actions the operator should perform?

A. Leave the locking device installed and perform a locking device operability check only.

B. Leave the locking device installed, verify mark on stem matches the appropriate position established when the valve was initially positioned.

C. Unlock the valve, turn the handwheel in the closed direction for 1 full turn to verify the valve is throttled, reopen the valve 1 full turn and install the locking device.

D. Unlock the valve, turn the handwheel in the closed direction and count the number of turns until it is seated, reopen the valve to the appropriate position and install the locking device.

References: LT-LP-30004 Rev. 04 pg 36 of 64
EO 300.022.a.06
Modified the question from a locked open valve to a throttled valve.
Question #85 on 1995 SRO exam.

A. Correct answer.

B. Incorrect since there is not a mark on the stem when the valve is initially positioned.

C. Incorrect since the valve should not be operated to verify position.

D. Incorrect since the valve should not be operated to verify position.

91. G2.1.32 001

You have just been notified by the SOS that solvent based painting is scheduled to be performed in the Reactor Building which covers an area of the floor approximately 200 ft^2. The SBGT system takes a suction from this area when the system is in operation.

Which ONE of the following describes the effect of running the SBGT System under these conditions and the actions that should be taken prior to commencing painting?

A. The paint fumes increase the load on the SBGT fan. The CBO for each Unit should log that SBGT cannot be started for 4 hours after painting is complete.

B. The paint fumes will contaminate the SBGT Charcoal filters if the system is started while painting is in progress. Both SBGT switches should be placed in OFF until painting is complete.

C. The paint fumes will contaminate the SBGT Charcoal filters if the system is started within 4 hours of completing the painting. Tags should be hung on the SBGT Fan control switches stating "SOLVENT BASED PAINTING IN PROGRESS".

D. The paint fumes could start a fire in the SBGT Train due to the heater being on when the system initiates. Both SBGT switches should be placed in OFF until painting is complete.

Reference: 34SO-T46-001-2S Rev. 14 Pg 3

A. Incorrect since the paint fumes do not increase the load on the SBGT system. The fumes affect the operation of the charcoal filters.

B. Incorrect since you do not place the SBGT control switches in OFF when painting is in progress.

C. Correct answer per 34SO-T46-001-2S Precaution 5.1.4.

D. Incorrect since the paint fumes could not start a fire in the SBGT train and you do not place the SBGT control switches in OFF when painting is in progress.

92. G2.2.1 001

Unit 2 is in a startup and is currently at approximately 20% RTP. A heat balance has been performed and indicates that Core Thermal Power is 23% RTP. The APRM readings should be adjusted such that _____.

A. each APRM is reading between -2% to +2% of the heat balance value.

B. ✓ each APRM is reading between 0% to +2% of the heat balance value.

C. each APRM is reading between -2% to 0% of the heat balance value.

D. each APRM is reading between -1% and +1% of the heat balance value.

References: 34GO-OPS-001-2S Rev. 35.1 pg 33 of 61.
Unit 2 Tech Specs Section 3.3.1.1 (SR 3.3.1.1.2)

A.I Incorrect since the value must be between 0 and 2%.

B. Correct answer.

C. Incorrect since the value must be between 0 and 2%.

D. Incorrect since the value must be between 0 and 2%.

93. G2.2.13 001

During an outage on Unit 1, the 1A Core Spray pump motor has been replaced. The maintenance department has asked to momentarily start the pump to check for proper rotation.

Which ONE of the following should the SS/TDO perform in order to support this?

A. Release the applicable subclearance that applies to the MWO being worked.

B. Release all subclearances that require the 1A Core Spray pump to be tagged.

C. ✓ Issue a temporary release after verifying all subclearance holders concur.

D. Ensure that the maintenance department is using personalized danger tags.

References: 30AC-OPS-001-0S Rev. 23 pg 62-65 of 94.
Previous exam 95-SRO-01 test question #89.
changed Shift Supervisor to SS/TDO and resequenced answers.

A. Incorrect since can't release subclearances until all work is done.

B. Incorrect since can't release subclearances until all work is done.

C. Correct answer.

D. Incorrect since still need temporary release from other holders.

94. G2.2.3 001

The "B" CRD pump can be operated from the Remote Shutdown Panel AND the Control Room with the Emergency Transfer Switch (ETS) in a certain position.

Which ONE of the following describes the position of the Remote Shutdown Panel ETS and the Unit that is affected which will allow this to occur?

A. ETS in NORM on Unit 1.

B. ETS in NORM on Unit 2.

C. ETS in EMERG on Unit 1.

D. ETS in EMERG on Unit 2.

References: SI-LP-05201 Rev. 00 pg 8 of 56.

A. Correct answer.

B,C and D. Incorrect since Unit 1 has a switch configuration which allows equipment to be operated from the control room or the RSDP with the Emergency Transfer Switch in the NORM position. If it is the EMERG position then the equipment can only be operated from the RSDP.

95. G2.3.1 001

Which ONE of the following is the Plant Hatch initial administrative dose limit to the skin or any extremity (SDE)?

A. 2 rem/year

B. 6 rem/year

C. 15 rem/year

D. ✓ 20 rem/year

References: LT-LP-30008-02 Rev.2 pg 7 and 8 of 28
SRO exam 95-01 test question #92.
Modified the question from LDE limit to SDE limit and changed appropriate answer.

A. Incorrect since this is the annual admin limit for TEDE.

B. Incorrect since this is the annual LDE limit.

C. Incorrect since this is the 10 CFR annual LDE limit.

D. Correct answer.

96. G2.3.2 001

Health Physics technicians have surveyed the main steam chase during an outage and obtained the following results:

Area Dose Rates one foot from the source:	75 mR/hr
Airborne Concentration:	.23 DAC
Smear Results:	650 dpm/100cm2

Bases on these results which ONE of the following states how the area should be posted?

A. Contaminated Area.

B. Airborne Radioactivity Area.

C. ✓ Radiation Area.

D. High Radiation Area.

References: LT-LP-30008 Rev. 2 pg 13-17 of 28
SRO exam 95-01 question #93.
Changed numbers in stem but with same results and reordered answers.

A. Incorrect since < 1000dpm/100cm2.

B. Incorrect since < .3 DAC.

C. Correct answer.

D. Incorrect since < 100 mR/hr.

97. G2.4.12 001

Unit 1 was operating at 50% RTP when a steam leak in the Drywell caused a Reactor Scram on High Drywell Pressure. The Shift Supervisor entered all appropriate EOP's for this condition and ordered Torus Sprays to be initiated per PC/P leg. Subsequently, Drywell Temperature increased to 160°F.

Which ONE of the following states the appropriate action for the crew to take in this situation?

A. The Control Board Operator announces the new Entry Condition for PC-1 Primary Containment Control. The Shift Supervisor circles this entry condition and continues on in the PC-1 Primary Containment Control flow chart at the current steps.

B. The Control Board Operator announces the new Entry Condition for PC-1 Primary Containment Control. The Shift Supervisor circles the entry condition and orders actions for Drywell Temperature leg only.

C. The Control Board Operator continues to place Torus Sprays in service and updates the crew at the next Brief that Drywell Temperature has increased >150°F.

D. The Control Board Operator announces the new Entry Condition for PC-1 Primary Containment Control. The Shift Supervisor circles the entry condition and re-enters all legs of PC-1 Primary Containment Control.

References: PC-1 Primary Containment Control Rev. 4
30AC-OPS-013-0S Rev. 9.1 pg 5 of 10.

A. Incorrect since Shift Supervisor must re-enter all legs of the flow chart.

B. Incorrect since Shift Supervisor must re-enter all legs of the flow chart.

C. Incorrect since Control Board Operator should immediately announce an entry condition into the EOP's.

D. Correct answer.

98. G2.4.16 001

Unit 1 is operating at 100% RTP. Drywell temperature has been increasing steadily and is currently at 275°F and increasing. All other parameters are within their normal operating band.

Which ONE of the following describes the proper directions and sequence of events to the point of placing the Mode Switch in Shutdown?
(Provide RO copy of RC RPV CONTROL (NON ATWS) and PC-1 PRIMARY CONTAINMENT CONTROL)

A. Enter RC RPV CONTROL (NON ATWS) at Point A due to Drywell High Temperature. Place the Mode Switch in Shutdown per RC-1 then enter PC-1 to control Drywell temperature.

B. Enter PC-1 when Drywell Temperature exceeds 150°F. Enter RC RPV CONTROL at point A before Drywell Temperature reaches 340°F. Perform RC-1 to manually scram the reactor and place the Mode Switch in Shutdown.

C. Enter RC RPV CONTROL (NON ATWS) due to a condition which requires a reactor scram and reactor power is above 5%. Perform RC-1 to manually scram the reactor and place the Mode Switch in Shutdown.

D. Enter PC-1 when Drywell Temperature exceeds 150°F. Enter RC RPV CONTROL at point A before Drywell Temperature reaches 280°F. Perform RC-1 to manually scram the reactor and place the Mode Switch in Shutdown.

References: RC RPV CONTROL (NON ATWS) Rev. 6
PC-1 PRIMARY CONTAINMENT CONTROL Rev. 4

A. Incorrect since this is improper sequence for getting to the point of placing the Mode Switch in Shutdown.

B. Incorrect since you enter RC RPV CONTROL "before" drywell temperature reaches 280°F. 340°F is associated with Unit 2.

C. Incorrect since RC RPV CONTROL is entered from PC-1 PRIMARY CONTAINMENT CONTROL.

D. Correct answer.

99. G2.4.43 001

A Fire has been reported by the Unit 1 EHC skid and the Fire Brigade has been dispatched.

Which ONE of the following describes how the Shift Supervisor maintains constant communications with the Fire Brigade from the Main Control Room?

A. A hand held radio dedicated to UHF Channel 1.

B. VHF base station dedicated to VHF Channel 2.

C. UHF base station dedicated to VHF Channel 1.

D. A hand held radio dedicated to VHF Channel 2.

Deleted KAK 11/21/02

References: LT-LP-10004 Rev. 03 pg 15 of 19.
LO LT-10004.008

A. Incorrect since hand held radios are not used in the Control Room.

B. Correct answer.

C. Incorrect answer since the base channel is VHF and uses Channel 2.

D. Incorrect since hand held radios are not used in the Control Room.

100. G2.4.47 001

The following conditions exist for Unit 2 at the indicated times:

	0200	0300	0400
Reactor Power	100%	85%	60%
Reactor Water Level	+37"	+37"	+35"
Drywell Pressure	1.3 psig	1.5 psig	1.7 psig
Torus Pressure	.9 psig	1.1 psig	1.2 psig
Torus Level	150"	137"	123"
Torus Temperature	85°F	85°F	86°F

Which ONE of the following indicates the status of the plant when the operator turns over to the next shift at 0700 if current trends continue as they are?

A. Reactor in Mode 3 with Drywell Sprays in progress.

B. Reactor in Mode 3 with a cooldown in progress at <100°F/hr.

C. HPCI operation is prevented and Emergency Depressurization has been initiated.

D. Recirc pumps and drywell cooling fans are tripped. Torus cooling and sprays are initiated.

References: PC-1 Primary Containment Control Rev. 4 Att. 1

A. Incorrect since drywell sprays are not initiated until you cannot stay below 11 psig torus pressure or 340°F Drywell temperature. Current trends do not come close to these limits.

B. Incorrect since an Emergency Depressurization is required prior to 0700 due to torus level <98 inches. This will exceed 100°F cooldown rate.

C. Correct answer due to lowering torus level. At 110 inches then HPCI is prevented from operation and at 98 inches the reactor is depressurized.

D. Incorrect since drywell coolers and recirc pumps are not directed to be tripped unless conditions noted in A above are met.

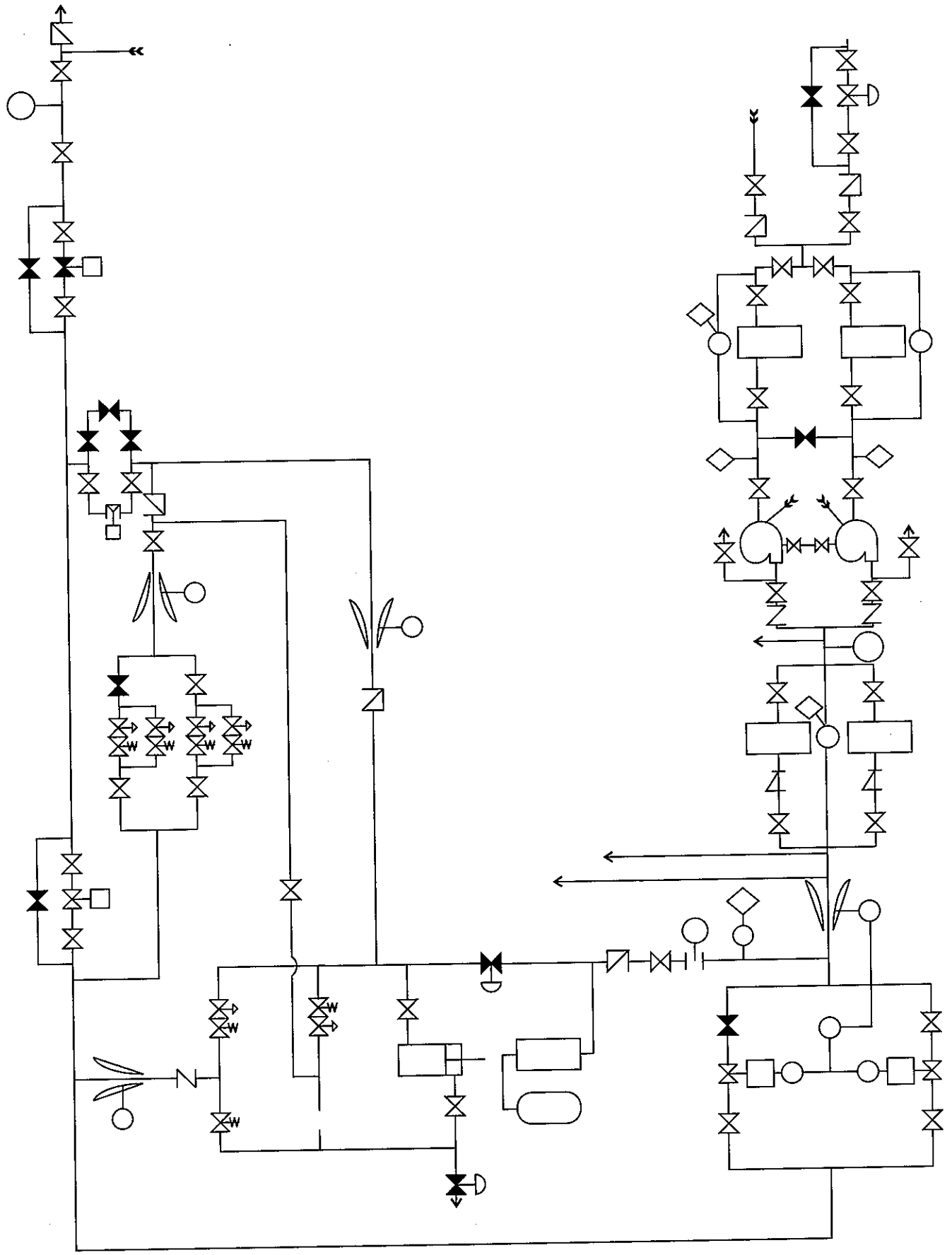
You have completed the test!

NRC EXAM 2002
PLANT HATCH
WRITTEN EXAM
REFERENCE
BOOK

MASTER
RO

RO References – NRC Exam 2002

1. Unit 2 CRD Simplified Diagram
2. Unit 1 Tech Spec Section 3.5.1
3. Unit 1 EOP Graph 9 (CS VORTEX)
4. Unit 1 EOP Graph 11A (CS NPSH)
5. Unit 1 EOP Graph 11B(CS NPSH).
6. Unit 1 Tech Specs Section 3.7.4
7. Unit 2 EOP Graph 5 (BIIT)
8. Unit 2 Secondary Containment Control (SCC) EOP Flowchart
9. Unit 1 RC RPV Control (Non-ATWS) EOP Flowchart
10. Unit 1 Primary Containment Control (PC-1) EOP Flowchart



3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of six of seven safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable.	A.1	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours
C. HPCI System inoperable.	C.1	Verify by administrative means RCIC System is OPERABLE.	1 hour
	AND		
	C.2	Restore HPCI System to OPERABLE status.	14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. HPCI System inoperable. AND One low pressure ECCS injection/spray subsystem is inoperable.	D.1	Restore HPCI System to OPERABLE status. OR	72 hours
	D.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours
E. Two or more ADS valves inoperable. OR Required Action and associated Completion Time of Condition C or D not met.	E.1	Be in MODE 3. AND	12 hours
	E.2	Reduce reactor steam dome pressure to ≤ 150 psig.	36 hours
F. Two or more low pressure ECCS injection/spray subsystems inoperable. OR HPCI System and two or more ADS valves inoperable.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.1.2	----------NOTE---------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. ---------- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 90 psig.	31 days
SR 3.5.1.4	Verify the RHR System cross tie valve is closed and power is removed from the valve operator.	31 days
SR 3.5.1.5	(Not used.)	
SR 3.5.1.6	----------NOTE---------- Only required to be performed prior to entering MODE 2 from MODE 3 or 4, when in MODE 4 > 48 hours. ---------- Verify each recirculation pump discharge valve cycles through one complete cycle of full travel or is de-energized in the closed position.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF CS / ≥ 4250 gpm / 1 / ≥ 113 psig LPCI / ≥ 17,000 gpm / 2 / ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.1.8	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 1058 psig and ≥ 920 psig, the HPCI pump can develop a flow rate ≥ 4250 gpm against a system head corresponding to reactor pressure.	92 days
SR 3.5.1.9	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 4250 gpm against a system head corresponding to reactor system pressure.	24 months
SR 3.5.1.10	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	24 months

(continued)

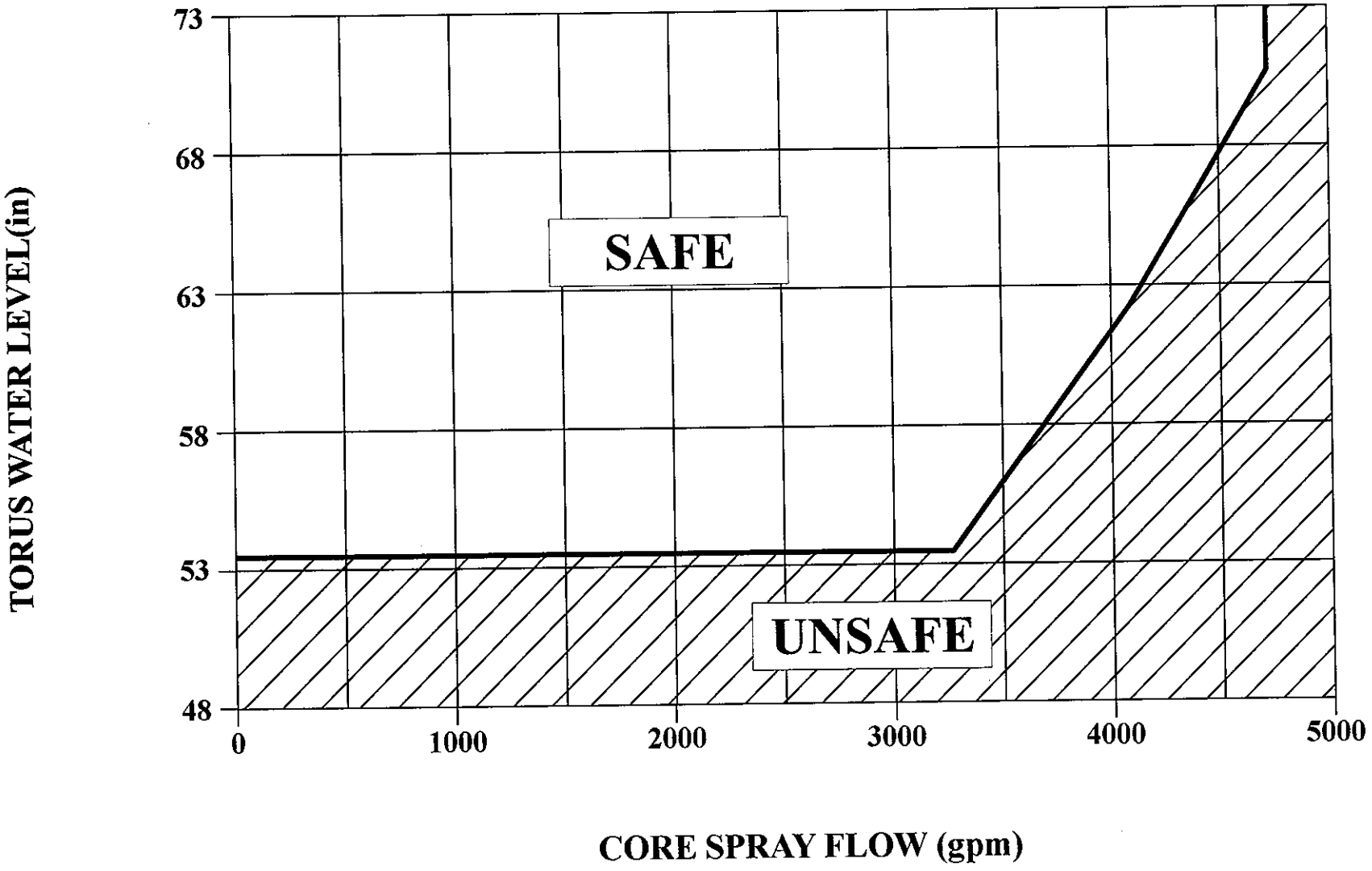
SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.11	----------NOTE---------- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	24 months
SR 3.5.1.12	Verify each ADS valve relief mode actuator strokes when manually actuated.	24 months

GRAPH 9

UNIT 1

CORE SPRAY VORTEX LIMIT

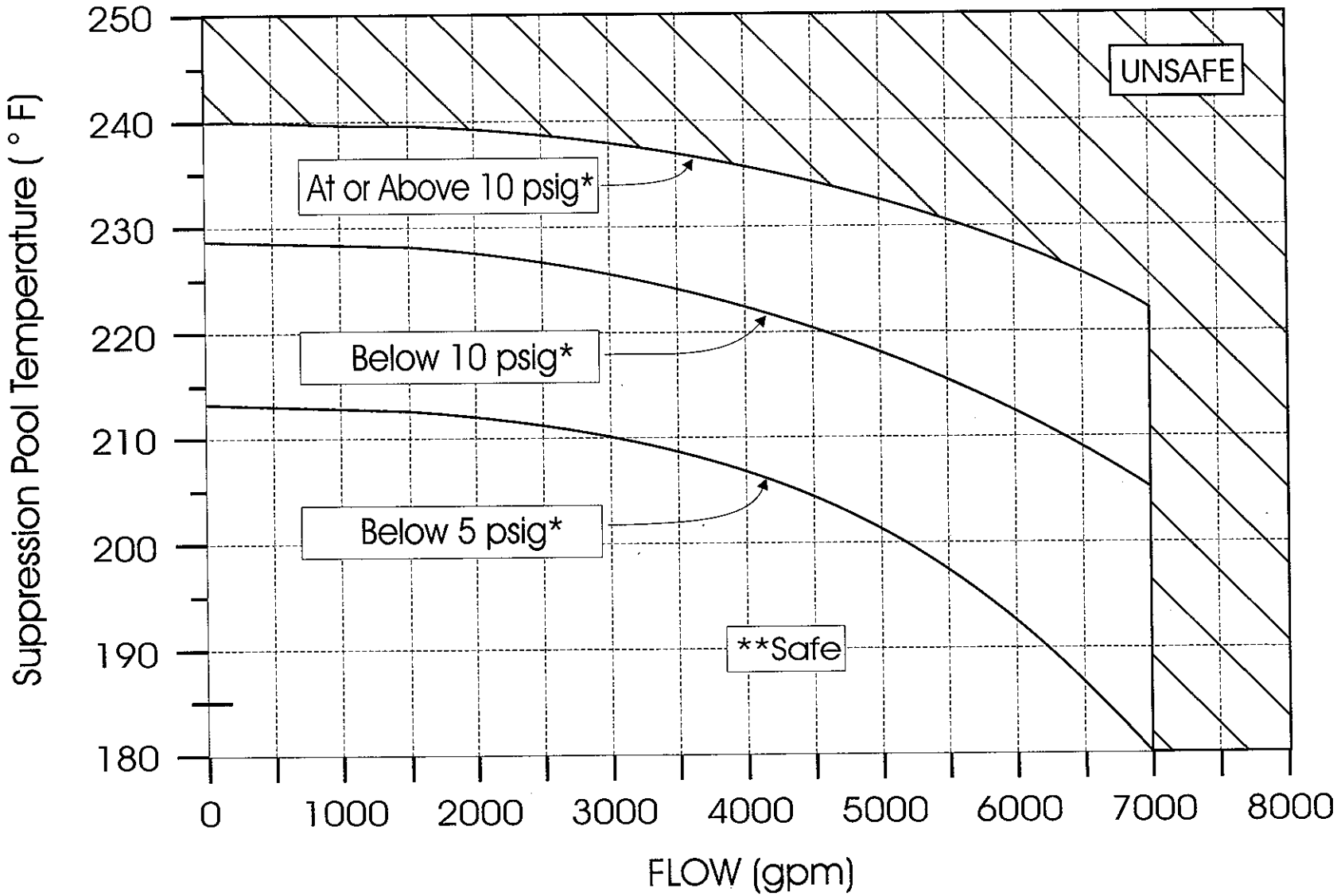


NOTE: Ma··se SPDS Emergency Displays in place of this Graph.

GRAPH 11A

UNIT 1

Core Spray Pump NPSH Limit
(Suppression Pool Water Level At or Above 146")



Note: May use SPDS Emergency Displays in place of this Graph.

* Suppression Chamber Pressure.

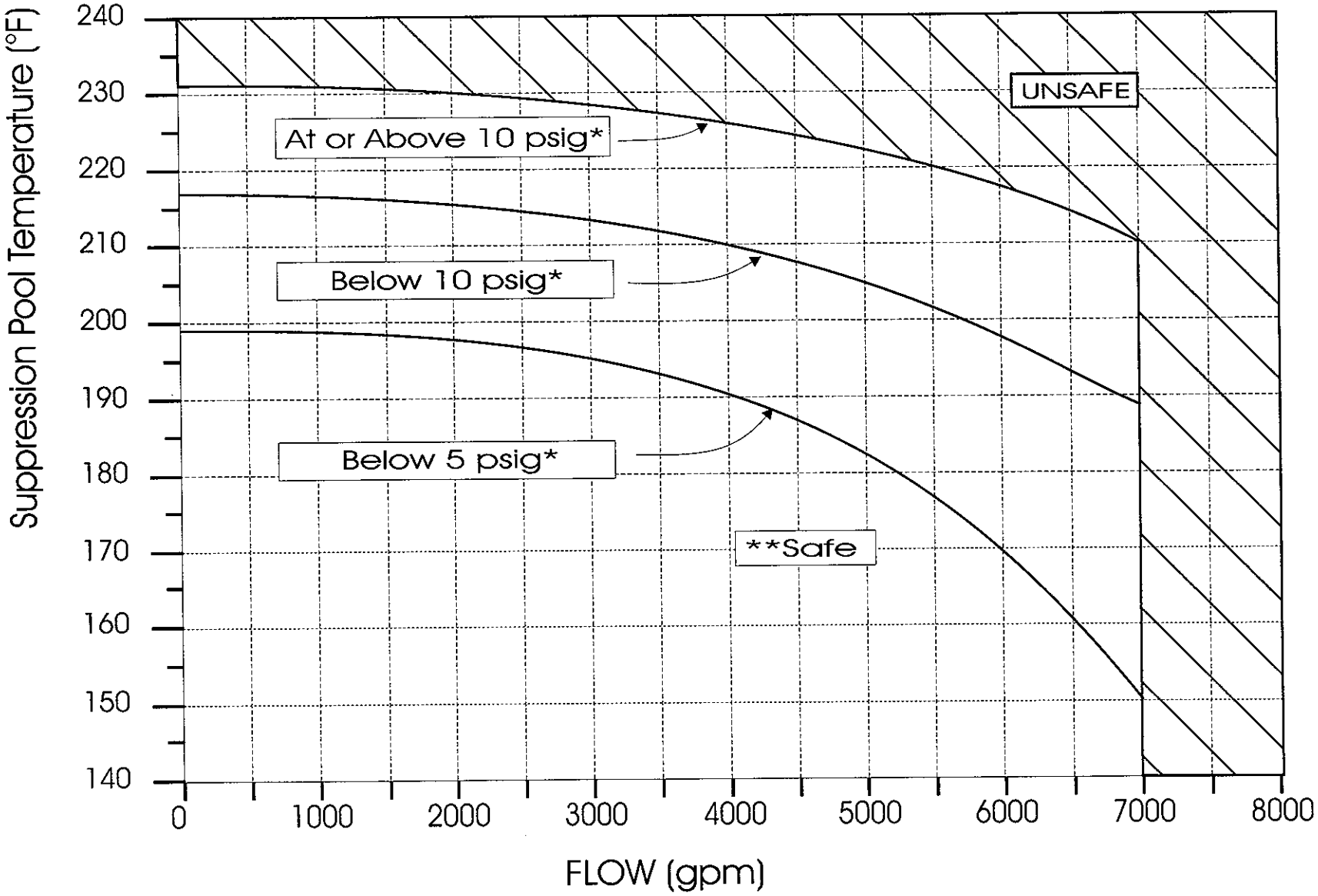
** Safe operating region is below the applicable pressure line.

GRAPH 11B

Core Spray Pump NPSH Limit

(Suppression Pool Water Level Below 146")

UNIT 1



Note: May use SPDS Emergency Displays in place of this Graph.

* Suppression Chamber Pressure.

3.7 PLANT SYSTEMS

3.7.4 Main Control Room Environmental Control (MCREC) System

LCO 3.7.4 Two MCREC subsystems shall be OPERABLE.

---NOTE---
The main control room boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MCREC subsystem inoperable.	A.1 Restore MCREC subsystem to OPERABLE status.	7 days
B. Two MCREC subsystems inoperable due to inoperable control room boundary in MODE 1, 2, or 3.	B.1 Restore control room boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE MCREC subsystem in pressurization mode. OR D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND D.2.2 Suspend CORE ALTERATIONS. AND D.2.3 Initiate action to suspend OPDRVs.	Immediately Immediately Immediately Immediately
E. Two MCREC subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	E.1 Enter LCO 3.0.3.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two MCREC subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- F.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND F.2 Suspend CORE ALTERATIONS. AND F.3 Initiate action to suspend OPDRVs.	 Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Operate each MCREC subsystem ≥ 15 minutes.	31 days
SR 3.7.4.2	Perform required MCREC filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.4.3	Verify each MCREC subsystem actuates on an actual or simulated initiation signal.	24 months

(continued)

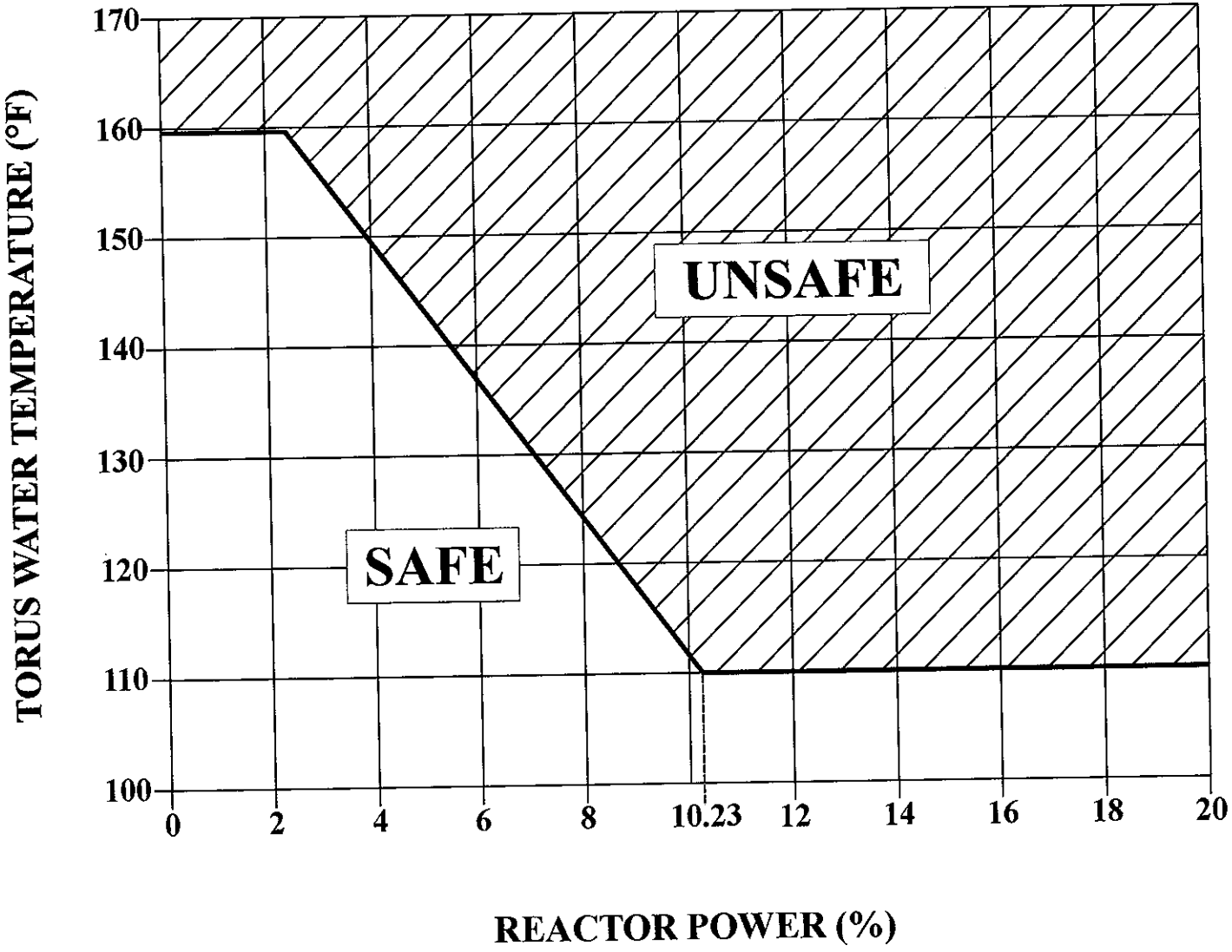
SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.4.4	Verify each MCREC subsystem can maintain a positive pressure of ≥ 0.1 inches water gauge relative to the turbine building during the pressurization mode of operation at a subsystem flow rate of ≤ 2750 cfm and an outside air flow rate ≤ 400 cfm.	24 months on a STAGGERED TEST BASIS

GRAPH 5

UNIT 2

BORON INJECTION INITIATION TEMPERATURE



NOTE: May use SPDS Emergency Displays in place of this Graph.

SC - SECONDARY CONTAINMENT CONTROL

PLANT E. I. HATCH — UNIT 2

SC - SECONDARY CONTAINMENT CONTROL
RR - RADIOACTIVITY RELEASE CONTROL

31EO-EOP-014-2S | REV. 6 | ATTACHMENT 1

BWROG EPG/SAG REV. 1

Area ambient or differential temperature above Table 4 Maximum Normal Operating Temperature

Area or floor drain sump water level above Table 5 Maximum Normal Operating Water Level

Area or HVAC exhaust radiation level above Table 6 Maximum Normal Operating Radiation Level

Differential pressure at or above 0 in. of water

WHILE PERFORMING THE FOLLOWING

IF	THEN
PRIMARY CONTAINMENT FLOODING IS OR HAS BEEN REQUIRED	exit the EOPs and enter the Severe Accident Guidelines

→ Go to SAGs

WHILE PERFORMING THE FOLLOWING

IF	THEN
ANY Unit 1 or Unit 2 secondary containment HVAC exhaust radiation level exceeds the isolation setpoint (Table 14)	confirm o Unit 1 and Unit 2 Reactor Building HVAC isolation o Unit 1 and Unit 2 Refuel Floor HVAC isolation o Unit 1 and Unit 2 SBGT initiation per 34AB-T22-003-2S
Refuel Floor HVAC isolates AND a Unit 1 or Unit 2 secondary containment radiation condition does NOT exist	restart Refuel Floor HVAC per 34SO-T41-006-2S If necessary defeat high drywell pressure AND low RWL isolation interlocks per 31EO-EOP-100-2S
Reactor Building HVAC isolates AND a Unit 1 or Unit 2 secondary containment radiation condition does NOT exist	restart Reactor Building HVAC per 34SO-T41-005-2S If necessary defeat high drywell pressure AND low RWL isolation interlocks per 31EO-EOP-100-2S

PERFORM CONCURRENTLY

SC/T

Operate available area coolers in affected areas.

IF a secondary containment radiation condition does NOT exist

THEN operate the following:
- Refuel Floor HVAC per 34SO-T41-006-2S
- Reactor Building HVAC per 34SO-T41-005-2S

WAIT UNTIL
area ambient or differential temperature is above Maximum Normal Operating Temperature (Table 4)

Isolate ALL systems discharging into area EXCEPT systems required to:
- assure adequate core cooling
- shut down reactor
- suppress fire
- maintain primary containment integrity

PERFORM CONCURRENTLY

WAIT UNTIL
primary system is discharging reactor coolant into secondary containment (Table 7)

WAIT UNTIL
area ambient or differential temperature is above Maximum Safe Operating Temperature in more than one area (Table 4)

Shut down reactor per 34GO-OPS-013-2S or 34GO-OPS-014-2S

BEFORE
ANY area ambient or differential temperature reaches Maximum Safe Operating Temperature (Table 4)

PERFORM CONCURRENTLY RC(A) point A

WAIT UNTIL
area ambient or differential temperature is above Maximum Safe Operating Temperature in more than one area (Table 4)

EMERGENCY DEPRESS IS REQUIRED

SC/L

WAIT UNTIL
ONE of the following is above Maximum Normal Operating Water Level (Table 5):
- A floor drain sump water level
- An area water level

Operate available sump pumps to restore and maintain water level below Maximum Normal Operating Water Level (Table 5)

IF ONE of the following CANNOT be restored and maintained below Maximum Normal Operating Water Level (Table 5):
- ANY floor drain sump water level
- ANY area water level

THEN isolate ALL systems discharging water into sump or area EXCEPT systems required to:
- assure adequate core cooling
- shut down reactor
- suppress fire
- maintain primary containment integrity

PERFORM CONCURRENTLY

WAIT UNTIL
primary system is discharging reactor coolant into secondary containment (Table 7)

WAIT UNTIL
area water level is above Maximum Safe Operating Water Level in more than one area (Table 5)

Shut down reactor per 34GO-OPS-013-2S or 34GO-OPS-014-2S

BEFORE
ANY area water level reaches Maximum Safe Operating Water Level (Table 5)

PERFORM CONCURRENTLY RC(A) point A

WAIT UNTIL
area water level is above Maximum Safe Operating Water Level in more than one area (Table 5)

EMERGENCY DEPRESS IS REQUIRED

SC/R

WAIT UNTIL
area radiation level is above Maximum Normal Operating Radiation Level (Table 6)

Isolate ALL systems discharging into area EXCEPT systems required to:
- assure adequate core cooling
- shut down reactor
- suppress fire
- maintain primary containment integrity

PERFORM CONCURRENTLY

WAIT UNTIL
primary system is discharging reactor coolant into secondary containment (Table 7)

WAIT UNTIL
area radiation level is above Maximum Safe Operating Radiation Level in more than one area (Table 6)

Shut down reactor per 34GO-OPS-013-2S or 34GO-OPS-014-2S

BEFORE
ANY area radiation level reaches Maximum Safe Operating Radiation Level (Table 6)

PERFORM CONCURRENTLY RC(A) point A

WAIT UNTIL
area radiation level is above Maximum Safe Operating Radiation Level in more than one area (Table 6)

EMERGENCY DEPRESS IS REQUIRED

RR - RADIOACTIVITY RELEASE CONTROL

Offsite radioactivity release rate above 0.57 mR/hr → ALERT

WHILE PERFORMING THE FOLLOWING

IF	THEN
PRIMARY CONTAINMENT FLOODING IS OR HAS BEEN REQUIRED	exit the EOPs and enter the Severe Accident Guidelines

→ Go to SAGs

WHILE PERFORMING THE FOLLOWING

IF	THEN
Turbine Building HVAC is shutdown	restart Turbine Building HVAC as required per 34SO-U41-001-2S

Isolate ALL primary systems discharging reactor coolant into areas outside primary and secondary containments (Table 7) EXCEPT systems required to:
- assure adequate core cooling
- shut down reactor
- maintain primary containment integrity

WAIT UNTIL
primary system in Table 7 is discharging reactor coolant outside primary and secondary containments

BEFORE
offsite radioactivity release rate reaches 1000 mR/hr → GENERAL

PERFORM CONCURRENTLY RC(A) point A

EMERGENCY DEPRESS IS REQUIRED

Table 4 SECONDARY CONTAINMENT OPERATING TEMPERATURES

AMBIENT TEMP (2B21B-S1/S7) on 2H11-P614, 2G31-R604	Max Normal Operating Value °F	Max Safe Operating Value °F
158' ELEVATION AREA (RWCU)		
1 A pump room (South) (2G31-N016A)	150	215
2 B pump room (North) (2G31-N016B)	150	215
3 Hx Room (2G31-N016C)	150	215
4 Hx Room (2G31-N016D)	150	215
5 Phase Sep Tk Room (2G31-N016E)	150	215
185' ELEVATION AREA (RWCU)		
6 RWCU Valve Nest (2G31-N016F)	150	215
NORTHEAST DIAGONAL AREA		
7 RHR/CS A (2E11-N009A)	150	190
SOUTHEAST DIAGONAL AREA		
8 RHR/CS B (2E11-N009B)	150	190
HPCI ROOM AREA		
9 Pump Room (2E41-N024)	167.5	245
10 Emer Area Clr (2E41-N030A)	167.5	245
11 Emer Area Clr (2E41-N030B)	167.5	245
RCIC ROOM AREA		
12 Pump Room (2E51-N011)	167.5	310
13 Emer Area Clr (2E51-N023A)	167.5	310
14 Emer Area Clr (2E51-N023B)	167.5	310
TORUS ROOM AREA		
15 West Wall (2E51-N025A)	167.5	212.5
16 Northwest Wall (2E51-N025B)	167.5	212.5
17 Northeast Wall (2E51-N025C)	167.5	212.5
18 Southeast Wall (2E51-N025D)	167.5	212.5
MAIN STEAM LINE TUNNEL AREA		
19 2B21-N014	192.5	310
HPCI PIPE PENETRATION ROOM		
1 2E41-N046A	167.5	212.5
2 2E41-N046B	167.5	212.5

DIFF TEMP (2B21B-S2) on 2H11-P614, 2G31-R608	Max Normal Operating Value °F	Max Safe Operating Value °F
158' ELEVATION AREA (RWCU)		
1 A pump room (2G31-N022A/N023A)	67	99
2 B pump room (2G31-N022B/N023B)	67	99
3 Hx Room (2G31-N022C/N023C)	67	99
4 Hx Room (2G31-N022D/N023D)	67	99
5 Phase Sep Tk Room (2G31-N022E/N023E)	67	99
185' ELEVATION AREA (RWCU)		
6 RWCU Valve Nest (2G31-N022F/N023F)	67	99
NORTHEAST DIAGONAL AREA		
7 RHR/CS A (2E11-N029A/N030A)	40	74
SOUTHEAST DIAGONAL AREA		
8 RHR/CS B (2E11-N029B/N030B)	40	74
TORUS ROOM AREA		
13 2E51-N026A/N027A	42	98
14 2E51-N026B/N027B	42	98
15 2E51-N026C/N027C	42	98
16 2E51-N026D/N027D	42	98
MAIN STEAM LINE TUNNEL AREA		
17 2B21-N016A/N016B	70	150

Table 5 SECONDARY CONTAINMENT OPERATING WATER LEVELS

AREA WATER LEVEL ANNUNCIATORS on 2H11-P657	Max Normal Operating Value	Max Safe Operating Value
SOUTHWEST DIAGONAL AREA		280 in. above 87' el.
1 RB S-W DIAGONAL FLOOR DRN SUMP LEVEL HIGH (657-033) (2T45-N007)	High	
2 CRD S-W DIAG INSTR SUMP LVL HIGH-HIGH-HIGH (657-032) (2T45-N005)	High High High	
SOUTHEAST DIAGONAL AREA		15 in. above 87' el.
3 RB S-E DIAGONAL FLOOR DRN SUMP HIGH-HIGH (657-034) (2T45-N006)	High High	
4 RHR-CS S-E DIAG INSTR SUMP LVL HIGH-HIGH-HIGH (657-103) (2T45-N003B)	High High High	
NORTHWEST DIAGONAL AREA		22 in. above 87' el.
5 RCIC N-W DIAG INSTR SUMP LVL HIGH-HIGH-HIGH (657-014) (2T45-N004)	High High High	
NORTHEAST DIAGONAL AREA		14 in. above 87' el.
6 RHR-CS N-E DIAG INSTR SUMP LVL HIGH-HIGH-HIGH (657-085) (2T45-N003A)	High High High	
HPCI ROOM AREA		14 in. above 87' el.
7 HPCI COMPT INSTR SUMP LEVEL HIGH-HIGH (657-066) (2T45-N001)	High High	
TORUS ROOM AREA		11 in. above 87' el.
8 TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH (657-013) (2T45-N002A)	High High High	
9 TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH (657-031) (2T45-N002B)	High High High	
10 TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH (657-049) (2T45-N002C)	High High High	
11 TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH (657-067) (2T45-N002D)	High High High	

Table 6 SECONDARY CONTAINMENT OPERATING RADIATION LEVELS

HVAC EXHAUST RADIATION ANNUNCIATORS on 2H11-P601	Max Normal Operating Value mR/hr	Max Safe Operating Value mR/hr
	HI-HI Radiation Annunciator	N/A
REACTOR BUILDING (RX)		
- RB BLDG POT CONTAM AREA RADIATION (2D11-K609 A-D)	9.5	N/A
REFUELING FLOOR		
- REFUELING FLOOR VENT EXHAUST RADIATION (2D11-K611 A-D)	15.0	N/A
- REFUELING FLOOR VENT EXHAUST RADIATION (2D11-K634 A-D)	6.9	N/A
- REFUELING FLOOR VENT EXHAUST RADIATION (2D11-K635 A-D)	5.7	N/A

AREA RADIATION MONITORS on 2H11-P600, 2D21-P600	Max Normal Operating Value mR/hr	Max Safe Operating Value mR/hr
REFUEL FLOOR AREA		
1 Reactor head laydown area (2D21-K601A)	50	1000
2 Dryer seperator pool (2D21-K601E)	50	1000
3 Spent Fuel Pool & New Fuel Storage (2D21-K601M)	50	1000
4 Reactor Vessel Refueling Floor (2D21-K611K)	50	1000
5 Reactor Vessel Refueling Floor (2D21-K611L)	50	1000
203' ELEVATION AREA (EAST)		
6 CRD repair area (2D21-K601T)	50	1000
203' ELEVATION AREA (WEST)		
7 Fuel pool demin panel (2D21-K600D)	50	100
185' ELEVATION AREA		
8 Spent fuel pool passageway (2D21-K601P)	50	1000
9 RB 185' operating floor (2D21-K601R)	50	1000
10 RB 185' sample panel area (2D21-K601S)	50	1000
11 RB 185' RWCU control panel (2D21-K601U)	150	1000
158' ELEVATION AREA (NORTH)		
12 RB 158' area N-E (2D21-K601C)	50	1000
13 RB 158' area N-W (2D21-K601D)	50	1000
158' ELEVATION AREA (SOUTH)		
14 RB 158' area S-E (2D21-K601B)	50	1000
15 Decant pump and equipment room area 158' (2D21-K601L)	50	1000
130' ELEVATION AREA (NORTHWEST)		
16 Tip area (2D21-K601F)	50	1000
130' ELEVATION AREA (NORTHEAST)		
17 RB 130' N-E working area (2D21-K601G)	50	1000
130' ELEVATION AREA (SOUTHEAST)		
18 South CRD HCU (2D21-K601N)	50	1000
130' ELEVATION AREA (SOUTHWEST)		
19 RB 130' S-W working area (2D21-K601H)	50	1000
NORTHWEST DIAGONAL AREA		
20 RCIC equipment N-W diagonal (2D21-K601V)	50	1000
SOUTHWEST DIAGONAL AREA		
21 CRD pump S-W diagonal (2D21-K601W)	50	1000
NORTHEAST DIAGONAL AREA		
22 CS & RHR N-E diagonal (2D21-K601X)	50	1000
SOUTHEAST DIAGONAL AREA		
23 CS & RHR S-E diagonal (2D21-K601Y)	150	1000

Table 7 PRIMARY SYSTEMS

Primary system discharging into area is defined as REACTOR COOLANT leak from:

- CRD
- Core Spray
- Feedwater
- HPCI
- Main steam
- Main steam drains
- RCIC
- Reactor sampling
- RWCU
- RHR
- SBLC

A system is considered a "primary system" if lowering reactor pressure would reduce the leak rate from the unisolated system.

Table 14 SECONDARY CONTAINMENT HVAC EXHAUST RADIATION ISOLATION SETPOINTS

HVAC EXHAUST RADIATION ANNUNCIATORS on 1(2)H11-P601	Isolation Setpoint mR/hr
- UNIT 1 RX BLDG POT CONTAM AREA (1D11-K609A-D)	18
- UNIT 1 REFUELING FLOOR VENT EXHAUST (1D11-K611A-D)	18
- UNIT 2 RX BLDG POT CONTAM AREA (2D11-K609A-D)	9.5
- UNIT 2 REFUELING FLOOR VENT EXHAUST (2D11-K611A-D)	15.0
- UNIT 2 REFUELING FLOOR VENT EXHAUST (2D11-K634A-D)	6.9
- UNIT 2 REFUELING FLOOR VENT EXHAUST (2D11-K635A-D)	5.7

RC RPV CONTROL (NON-ATWS)

PLANT E. I. HATCH		UNIT 1
RC RPV CONTROL (NON-ATWS)		
31EO-EOP-010-1S	REV. 8	ATTACHMENT 1
BWROG EPG/SAG REV. 1		

A condition which requires reactor scram and reactor power is above 5%

A condition which requires reactor scram and reactor power CANNOT be determined

RWL below +3 in.

Reactor pressure above 1074 psig

Drywell pressure above 1.85 psig

A

WHILE PERFORMING THE FOLLOWING

IF PRIMARY CONTAINMENT FLOODING IS OR HAS BEEN REQUIRED — THEN exit the EOPs and enter the Severe Accident Guidelines → Go to SAGs

Perform RC-1, RC-2, RC-3

WHILE PERFORMING THE FOLLOWING

IF ALL control rods are NOT inserted to or beyond position 02 AND control rods are NOT inserted to a cold shutdown rod configuration — THEN perform RPV Control (ATWS) → Go to RCA point A

PERFORM CONCURRENTLY

RC/P | RC/Q | RC/L

RC/Q → GO TO 34AB-C71-001-1S

B (1) (2)

Confirm automatic actions:
- ISOLATION per 34AB-C71-001-1S
- ECCS
- EMERGENCY DIESEL GENERATOR

(2)

WHILE PERFORMING THE FOLLOWING

IF	THEN
Emergency Depress is anticipated, EXCEPT for low RWL	rapidly depress with main turbine bypass valves, irrespective of the resulting cooldown rate.
EMERGENCY DEPRESS IS, OR HAS BEEN, REQUIRED	perform Emergency Depress → GO TO CP-1 point G
RWL CANNOT be determined	perform RPV Flooding → GO TO CP-2 point J
drywell pressure is above 1.85 psig	prevent injection from CS and LPCI pumps per 31EO-EOP-114-1S EXCEPT when required for adequate core cooling

NOTE 1
CS shutoff head = 280 psig
LPCI shutoff head = 220 psig

IF ANY SRV is cycling on its relief setpoint
THEN manually open SRVs UNTIL reactor pressure is below 960 psig use sequence listed in Table 1

WHILE PERFORMING THE FOLLOWING

IF	THEN
torus water temperature CANNOT be maintained below the Heat Capacity Temperature Limit (Graph 2)	maintain reactor pressure below the limit, irrespective of the resulting cooldown rate.
torus water level CANNOT be maintained below the SRV Tail Pipe Level Limit (Graph 8)	maintain reactor pressure below the limit, irrespective of the resulting cooldown rate.
STEAM COOLING IS REQUIRED	perform Steam Cooling → GO TO CP-1 point F

D (3) (4) (5)

Stabilize reactor pressure below 1074 psig with main turbine bypass valves. If desired use one or more of the following:
- Low Low Set
  If necessary, allow reactor pressure to exceed 1074 psig then OPEN any SRV to initiate LLS
- Alternate Reactor Pressure Control System(s) in Table 1 per 31EO-EOP-107-1S

WAIT UNTIL a reduction in reactor pressure will NOT complicate RWL control

Begin reactor pressure reduction per 34SO-OPS-013-1S AND maintain the cooldown rate below 100 °F/hr, defeating isolation interlocks and restoring drywell pneumatics if necessary per 31EO-EOP-100-1S

IF one or more SRVs are being used to depressurize the RPV AND continuous SRV pneumatic supply is or becomes unavailable,
THEN depressurize with sustained SRV opening.

NOTE 5
Sustained opening is prolonged opening that limits the number of times an SRV is cycled without exceeding the cooldown rate

C

WAIT UNTIL reactor pressure is below 138 psig

Continue to cool down to cold shutdown conditions with shutdown cooling EXCEPT for the RHR loop(s) required to maintain RWL above +3 in.

Maintain the cooldown rate below 100 °F/hr.

IF shutdown cooling CANNOT be established
THEN maintain reactor pressure below 138 psig using Alternate Reactor Pressure Control System(s) in Table 1 per 31EO-EOP-107-1S.

WHILE PERFORMING THE FOLLOWING

IF	THEN
RWL CANNOT be determined	perform RPV Flooding → GO TO CP-2 point J
primary containment water level and torus pressure CANNOT be maintained below Primary Containment Pressure Limit (Graph 13) AND adequate core cooling can be assured	terminate injection into the RPV from sources external to the primary containment

(3) (4) (5)

Restore and maintain RWL between +3 in. and +50 in. using Table 2 system(s)

IF RWL CANNOT be restored and maintained above +3 in.
THEN maintain RWL above -155 in. using Table 2 system(s)

IF required by ALC
THEN use Table 9 system(s) per 31EO-EOP-110-1S

WHILE PERFORMING THE FOLLOWING

IF RWL CANNOT be restored and maintained above -155 in. — THEN perform Alternate Level Control → GO TO CP-1 point E

IF the ADS timer has initiated
THEN inhibit ADS

Table 1 ALTERNATE REACTOR PRESSURE CONTROL SYSTEM(S) (3) (4) (5)

- SRVs ONLY when torus water level is above +63 in., defeating pneumatic supply isolation interlocks and restoring the pneumatic supply if necessary per 31EO-EOP-100-1S:
  Preferred sequence: G, D, L, H, E, F, A, J, K, C, B.
  If continuous SRV pneumatic supply is or becomes unavailable, place each SRV control switch in CLOSE or AUTO.
- HPCI with suction from the condensate storage tank if available.
- RCIC with suction from the condensate storage tank if available.
- Other steam driven equipment:
  -SJAEs
  -RFPTs
  -Main turbine cleat warming
  -HPCI drains
  -RCIC drains
- RWCU (recirculation mode), bypassing filter/demineralizers.
- MSL drains
- RWCU (blowdown mode), only if boron has NOT been injected OR it has been determined that a cold shutdown rod configuration exists; consult with Plant Chemistry prior to initiating blowdown.

Table 2 RCIC INJECTION SYSTEM(S) (3) (4) (5)

- Condensate/feedwater per 34SO-N21-007-1S
- CRD per 34SO-C11-005-1S
- RCIC, with suction from the condensate storage tank if available, per 34SO-E51-001-1S. If necessary, defeat any or all of the following:
  -high torus water level suction transfer logic per 31EO-EOP-100-1S
  -low reactor pressure isolation per 31EO-EOP-100-1S
  -high area temperature isolation per 31EO-EOP-100-1S
- HPCI with suction from the condensate storage tank if available, per 34SO-E41-001-1S. If necessary, defeat one or both of the following:
  -high torus water level suction transfer logic per 31EO-EOP-100-1S
  -high area temperature isolation per 31EO-EOP-100-1S
- Core Spray per 34SO-E21-001-1S
- LPCI, with injection through the heat exchangers as soon as possible per 34SO-E11-010-1S

Table 9 ALTERNATE INJECTION SUBSYSTEM(S)

- RHR Crosstie
- Fire System
- ECCS Keep-Full
- Condensate transfer
- SBLC (test tank)
- SBLC (boron tank)
- RHR Service Water crosstie

(1) CAUTION 1

RWL instrument may be used only if BOTH of the following exist:
- there is no indication of erratic instrument behavior
- the instrument reads above minimum level for the associated reference leg maximum run temperature

See 34AB-B21-002-1S for Caution 1

(2) CAUTION 2

1B21-LI-R604A(B) and 1B21-LR-R623A(B) CANNOT be used to determine RWL during rapid RPV depressurization below 500 psig

(3) CAUTION 3

Operation of HPCI, RCIC, CS, or RHR with suction from the torus and pump flow above the NPSH or vortex limit may result in equipment damage

(4) CAUTION 4

Elevated torus pressure may trip the RCIC turbine on high exhaust pressure of 40 psig

(5) CAUTION 5

Operation of HPCI or RCIC turbines with suction temperature above 140 °F may result in equipment damage

PC-1 PRIMARY CONTAINMENT CONTROL

PLANT E. I. HATCH	UNIT 1
PC-1 PRIMARY CONTAINMENT CONTROL	
31EO-EOP-012-1S | REV. 4	ATTACHMENT 1
BWROG EPG/SAG REV. 1	

Torus water level above 150 in.
Primary containment hydrogen concentration above 2.5%
Torus water level below 146 in.
Drywell temperature above 150 °F
Torus water temperature above 100 °F
Drywell pressure above 1.85 psig

WHILE PERFORMING THE FOLLOWING
IF PRIMARY CONTAINMENT FLOODING IS OR HAS BEEN REQUIRED, THEN exit the EOPs and enter the Severe Accident Guidelines → Go to SAGs

PERFORM CONCURRENTLY

PC/G

GO TO ANY entry condition on PC-2

SP/L

NOTE 2
If fuel failure is suspected consult with Plant Chemistry prior to discharging water

Monitor and control torus water level between 146 in. and 150 in. using:
- CS for low water levels per 34SO-E21-001-1S
- RHR for high water levels per 34SO-E11-010-1S

WAIT UNTIL torus water level CANNOT be maintained between 146 in. and 150 in.

Is torus water level below 146 in. or above 150 in.?

BELOW 146:

PERFORM CONCURRENTLY
- Maintain torus water level above 102 in. per 34SO-E21-001-1S or 34GO-OPS-087-1S
  - WAIT UNTIL torus water level CANNOT be maintained above 102 in.
  - PERFORM CONCURRENTLY RC[A] point A
  - EMERGENCY DEPRESS IS REQUIRED
- Maintain torus water level above 115 in. per 34SO-E21-001-1S or 34GO-OPS-087-1S
  - WAIT UNTIL torus water level CANNOT be maintained above 115 in.
  - Trip and prevent operation of HPCI irrespective of adequate core cooling

ABOVE 150:

IF RCIC or HPCI is operating, THEN defeat high torus water level suction transfer logic per 31EO-EOP-100-1S

PERFORM CONCURRENTLY
- Maintain torus water level below SRV Tail Pipe Level Limit (Graph 6) per 34SO-E11-010-1S or 34GO-OPS-087-1S
  - WAIT UNTIL torus water level CANNOT be maintained below SRV Tail Pipe Level Limit (Graph 6)
  - PERFORM CONCURRENTLY RC[A] point A
  - WAIT UNTIL torus water level AND reactor pressure CANNOT be restored and maintained below SRV Tail Pipe Level Limit (Graph 6)
  - Terminate injection into RPV from sources external to primary containment EXCEPT systems required for:
    - adequate core cooling
    - boron injection
    - CRD
  - WAIT UNTIL torus water level AND reactor pressure CANNOT be restored and maintained below SRV Tail Pipe Level Limit (Graph 6)
  - EMERGENCY DEPRESS IS REQUIRED
- Maintain torus water level below 197.5 in. per 34SO-E11-010-1S or 34GO-OPS-087-1S
  - WAIT UNTIL torus water level CANNOT be maintained below 197.5 in.
  - Terminate drywell sprays AND Terminate injection into RPV from sources external to primary containment EXCEPT systems required for:
    - adequate core cooling
    - boron injection
    - CRD
  - WAIT UNTIL torus water level CANNOT be maintained below 300 in.
  - Determine primary containment water level per 31EO-EOP-105-1S

SP/T

(5) Monitor and control torus water temperature below 100°F using available torus cooling per 34SO-E11-010-1S

WAIT UNTIL torus water temperature CANNOT be maintained below 100°F

(5) Operate ALL available torus cooling per 34SO-E11-010-1S EXCEPT RHR pumps required for adequate core cooling by continuous operation in LPCI mode

BEFORE torus water temperature reaches BIIT curve limit (Graph 5)

PERFORM CONCURRENTLY RC[A] point A

WAIT UNTIL torus water temperature AND reactor pressure CANNOT be maintained below Heat Capacity Temperature Limit (Graph 2)

EMERGENCY DEPRESS IS REQUIRED

DW/T

(6) Monitor and control drywell temperature below 150°F using:
- Drywell cooling fans per 34SO-T47-001-1S

WAIT UNTIL drywell temperature CANNOT be maintained below 150°F

NOTE 7
Refer to 34AB-B21-002-1S for water level corrections

Operate ALL available drywell cooling using:
- Drywell cooling fans per 34SO-T47-001-1S

If necessary defeat isolation interlocks per 31EO-EOP-100-1S

WHILE PERFORMING THE FOLLOWING
IF primary containment water level and torus pressure CANNOT be maintained below Primary Containment Pressure Limit (Graph 13), THEN terminate sprays from sources external to the primary containment

(7)

WHILE PERFORMING THE FOLLOWING
IF drywell sprays have been initiated AND BEFORE drywell pressure drops to 0 psig, THEN terminate drywell sprays

BEFORE drywell temperature reaches 280°F (Bulk)

PERFORM CONCURRENTLY RC[A] point A

(8) IF torus water level is below 197.5 in. AND drywell temperature and pressure are within the Drywell Spray Initiation Limit (Graph 8), THEN trip recirc pumps and drywell cooling fans AND initiate drywell sprays per 34SO-E11-010-1S EXCEPT RHR pumps required for adequate core cooling by continuous injection in LPCI mode

NOTE 9
Drywell spray flow limits:
- 17,000 gpm per loop
- 11,500 gpm through the heat exchanger

NOTE 10
If DW sprays are throttled closed, and an increase in DW pressure occurs, then DW sprays must be considered secured. Conditions for initiating DW sprays must be met to resume DW sprays

WAIT UNTIL drywell temperature CANNOT be maintained below 280°F (Bulk)

EMERGENCY DEPRESS IS REQUIRED

PC/P

(1) Monitor and control containment pressure below 1.85 psig using:
- containment pressure control systems per 34SO-T48-002-1S
- SBGT per 34SO-T48-001-1S

WAIT UNTIL primary containment pressure CANNOT be maintained below 1.85 psig

WHILE PERFORMING THE FOLLOWING
IF primary containment water level and torus pressure CANNOT be maintained below Primary Containment Pressure Limit (Graph 13), THEN terminate sprays from sources external to the primary containment

(7)

WHILE PERFORMING THE FOLLOWING
IF torus sprays have been initiated AND BEFORE torus pressure drops to 0 psig, THEN terminate torus sprays

NOTE 3
Torus pressure is indicated on the following:
- 1T48-PI-R632A (P657)
- 1T48-PI-R632B (P654)
- 1T48-PR-R608 (P657)
- 1T48-PR-R609 (P650)

BEFORE torus pressure reaches 10 psig

(8) IF torus water level is below 285 in., THEN initiate torus sprays per 34SO-E11-010-1S EXCEPT RHR pumps required for adequate core cooling by continuous injection in LPCI mode

(7)

WHILE PERFORMING THE FOLLOWING
IF drywell sprays have been initiated AND BEFORE drywell pressure drops to 0 psig, THEN terminate drywell sprays

WAIT UNTIL torus pressure is above 10 psig

ALERT

(8) IF torus water level is below 197.5 in. AND drywell temperature and pressure are within the Drywell Spray Initiation Limit (Graph 8), THEN trip recirc pumps and drywell cooling fans AND initiate drywell sprays per 34SO-E11-010-1S EXCEPT RHR pumps required for adequate core cooling by continuous injection in LPCI mode

NOTE 9
Drywell spray flow limits:
- 17,000 gpm per loop
- 11,500 gpm through the heat exchanger

NOTE 10
If DW sprays are throttled closed, and an increase in DW pressure occurs, then DW sprays must be considered secured. Conditions for initiating DW sprays must be met to resume DW sprays

WAIT UNTIL torus pressure CANNOT be maintained below Pressure Suppression Pressure (Graph 7)

EMERGENCY DEPRESS IS REQUIRED

BEFORE torus pressure reaches Primary Containment Pressure Limit (Graph 13)

WHILE PERFORMING THE FOLLOWING
IF torus is being vented AND more rapid depressurization of the primary containment is required to control containment pressure, THEN perform the following:

GO TO point U on this sheet

U

Is torus water level below 300 in.?
- NO: Is torus being vented?
  - NO: Vent torus per 31EO-EOP-101-1S irrespective of offsite radiological release rate. If necessary, defeat isolation interlocks
  - YES: Vent drywell per 31EO-EOP-101-1S irrespective of offsite radiological release rate. If necessary, defeat isolation interlocks
- YES: Control containment pressure below Primary Containment Pressure Limit (Graph 13)

CAUTION 1
RWL instrument may be used only if BOTH of the following exist:
- there is no indication of erratic instrument behavior
- the instrument reads above minimum level for the associated reference leg maximum run temperature

See 34AB-B21-002-1S for Caution 1

CAUTION 3
Operation of HPCI, RCIC, CS, or RHR with suction from the torus and pump flow above the NPSH or vortex limit may result in equipment damage

CAUTION 5
Operation of HPCI or RCIC turbines with suction temperature above 140 °F may result in equipment damage

CAUTION 7
Reducing primary containment pressure will reduce the available NPSH for pumps taking suction from the torus.

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