February 24, 2000

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Beverly Michael, Licensing Assistant, Operator Licensing and Human Performance Branch, Division of Reactor Safety, Region II

Beverly Michael

SUBJECT: OPERATOR LICENSING EXAMINATIONS ADMINISTERED ON AT H. B. ROBINSON STEAM ELECTRIC PLANT - DOCKET NO. 50-261

During July 26 - 29, 1999, Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

Item #1 - a) Facility submitted outline and initial exam submittal, designated for distribution under RIDS Code A070.

b) As given operating examination, designated for distribution under RIDS Code A070.

Item #2 - Examination report with the as given written examination attached, designated for distribution under RIDS Code IE42.

Attachments: As stated

ROBINSON

FINAL EXAM
AS GIVEN

Robinson Master
RO - 99-301

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information

Name:	Region: II
Date:	Facility/Unit: H. B. Robinson Unit 2
License Level: RO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

____
Applicant's Signature

Results

Examination Value	________	Points
Applicant's Score	________	Points
Applicant's Grade	________	Percent

1. Given the following plant conditions:

   - Control Rod H-8 from Control Bank "D" (CBD) has dropped into the core
   - A runback has occurred and the operators have stabilized the plant at 67% RTP
   - CBD @188 steps
   - The operators are preparing to recover rod H-8

   Which ONE (1) of the following describes the operability of Control Rod H-8 at this time?

   The rod is considered:

   A. operable because it can be moved by it's mechanism.

   B. operable because it is providing the assumed reactivity that would be available upon a reactor trip.

   C. inoperable because it is not trippable.

   D. inoperable because it is more than 7.5 inches out of alignment with it's bank.

2. Given the following plant conditions:

- The plant is in Hot Shutdown at 547°F with all reactor coolant pumps (RCP's) running, the following sequence of events occur
- Time Occurrence
  * 11:00 "B" RCP trips due to overcurrent relay failure
  * 11:50 "B" RCP started after maintenance and immediately trips
  * 12:35 "B" RCP started after maintenance and immediately trips
  * 13:50 "B" RCP successfully started

Which ONE (1) of the following correctly describes how these events affect the RCP starting requirements?

A. No RCP starting limits have been exceeded.

B. The pump start at 1150 exceeded RCP start limitations.

C. The pump start at 1235 exceeded RCP start limitations.

D. The pump start at 1350 exceeded RCP start limitations.

3. Given the following plant conditions:

- Crew has transitioned from GP-004, POST TRIP STABILIZATION, to EPP-5, NATURAL CIRCULATION COOLDOWN
- Operator has energized 150kw of PZR heaters

Which ONE (1) of the following describes the reason for energizing PZR heaters?

A. Minimize head voiding during the cooldown.

B. Minimize the potential of inadvertent dilution when borating.

C. Increase subcooling so cooldown rate can be increased to 25°F per hour.

D. Increase subcooling so cooldown rate can be increased to 100°F per hour.

4. Given the following plant conditions:

- Crew is performing EPP-6, NATURAL CIRCULATION COOLDOWN WITH A VOID IN THE VESSEL
- The Reactor Operator has been directed to control PZR level >20% and < 90%

Which ONE (1) of the following correctly describes the plant response if letdown is greater than charging?

A. PZR pressure will decrease. This will cause PZR level to decrease.

B. PZR pressure will decrease. This will cause PZR level to increase.

C. PZR pressure will increase. This will cause PZR level to increase.

D. PZR pressure will increase. This will cause PZR level to decrease.

5. Given the following plant conditions:

- Mode 1 at 100% RTP
- A malfunction occurs in the Pressurizer Pressure controller
- RCS pressure increases to 2300 psig

Which ONE (1) of the following describes an effect on the plant as a result of the controller malfunction?

A. VCT level decreases.

B. Seal return flow increases.

C. Seal injection flow decreases.

D. Charging flow on FI-122 decreases.

6. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS Subcooling is +165°F
- RCS Pressure is 1720 psig and decreasing
- S/G "A" level is 4% (NR), pressure is 300 psig
- S/G "B" level is 8% (NR), pressure is 320 psig
- S/G "C" level is 0% (NR), 45% (WR), pressure is 150 psig
- CV pressure is 16 psig
- All automatic features have actuated properly

Which ONE (1) of the following contains a correct diagnosis **and** action based on the above indications?

A. Feed header rupture outside of containment, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

B. Only "C" S/G faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

C. All S/G's faulted, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

D. All S/G's faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

7. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS pressure is 1950 psig
- Pressurizer level is 23%
- RCS temperature is 486°F
- RV1-1, Steam Line PORV for S/G "A" is partially OPEN and cannot be shut
- S/G "A" level is 25% WR, pressure is 400 psig and both are decreasing
- S/G "B" and "C" levels are 22% NR and stable

Which ONE (1) of the following contains the expected pressure in S/G's "B" and "C" based on the above indications?

A. 400 psig

B. 585 psig

C. 600 psig

D. 615 psig

8. Given the following plant conditions:

- The Unit is shutdown following a reactor trip
- The path directs you to EPP-11, FAULTED STEAM GENERATOR ISOLATION
- You discover that your copy of EPP-11 is missing
- Upon investigation, all of the copies of EPP-11 in the Control Room are all missing

Which ONE (1) of the following describes the correct process for verifying the current revision of EPP-11?

A. Refer to the "Ref Only" file in the POM directory on the LAN.

B. Refer to the the revision status on NRCS.

C. Reference the copy in the simulator for the correct revision number.

D. Contact document services to verify the current revision.

9. Given the following plant condition:

- Station Battery "A" has a capacity of 1070 amp-hours
- Station Battery "B" has a capacity of 340 amp-hours
- Each is sized to be able to carry expected shutdown loads during a design basis accident for a specified period of time without a battery charrger

Which ONE (1) of the following states the specified period of time for discharge **and** which battery has the higher discharge rate.

A. Both one hour; A has the highest discharge rate.

B. Both one hour, B has the highest discharge rate.

C. B one hour, A three hours, A has the highest discharge rate.

D. A one hour, B three hours, B has the highest discharge rate.

10. Given the following plant conditions:

- The plant has experienced a trip from 100% RTP

Upon initiation of AFW, which ONE (1) of the following correctly describes the automatic response of the AFW system to these conditions?

A. The normally closed MDAFW pump discharge flow control valves (FCV 1424 and 1425) fully open.

B. The normally open SDAFW pump discharge flow control valve (FCV 6416) throttles closed.

C. The normally closed SDAFW pump discharge flow control valve (FCV 6416) throttles open.

D. The normally open MDAFW pump discharge flow control valves (FCV 1424 and 1425) throttle closed.

11. Given the following plant conditions:

- Mode 1 at 100% RTP
- Instrument Bus 2 is being supplied by its alternate power supply
- Power is lost to Instrument Bus 4

Which ONE (1) of the following describes the required crew response?

A. Place Instrument Bus 4 on MCC-8.

B. Trip the reactor and enter Path-1.

C. Verify turbine runback stops when < 70% RTP.

D. Take manual control of all Feed Regulating Valves.

12. Given the following plant conditions:

- Mode 1 at 100% RTP
- A turbine runback occurs
- All windows on Bistable Status Panel "A" are extinguished

Which ONE (1) of the following would provide the above indications if all systems functioned as designed?

A. Loss of "B" battery

B. Loss of "A" battery

C. Loss of Instrument Bus 3

D. Loss of Instrument Bus 1

13. Given the following plant conditions:

- Crew is performing AOP-004, CONTROL ROOM INACCESSABILITY
- Operator is controlling S/G pressure locally between 785 and 935 psig

Which ONE (1) of the following best describes the correct RCS temperature band?

A. 516°F - 537°F

B. 514°F - 535°F

C. 518°F - 538°F

D. 516°F - 538°F

14. Given the following plant conditions:

- Mode 5 due to a forced outage
- Plant heat-up and Mode 4 entry is scheduled for 12 hours from now
- Several CV entries have been made which required both air lock doors to be opened at the same time

Which ONE (1) of the following describes the surveillance requirements that must be satisfied for CV Integrity?

OST-014, LLRT (Local Leak Rate Test) OF PERSONNEL AIR LOCK DOOR SEALS, shall be performed:

A. within 3 days of the initial entrance to the CV.

B. within 3 days of the final entrance to the CV.

C. prior to RCS temperature exceeding 200°F.

D. upon RCS temperature reaching 200°F.

15. Given the following plant conditions:

- RCS temperature is 225°F with a plant heatup in progress
- At 1200, while exiting Containment (CV), a group of personnel were unable to close the inner air lock door
- At 1215, the air lock interlock was defeated and the outer door opened and then closed
- At 1245, while entering the airlock to repair the inner door, the outer door malfunctioned and would not seal properly
- It is now 1250

Which ONE (1) of the following describes the correct action to be taken IAW ITS 3.6.2? (ATTACHED)

A. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1200 and verify an operable door closed by 1300.

B. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1215 and verify an operable door closed by 1315.

C. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1245 and verify an operable door closed by 1345.

D. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1250 and verify an operable door closed by 1350.

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Lock

LCO 3.6.2 The containment air lock shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

------------------------------------NOTES------------------------------------

1. Entry and exit is permissible to perform repairs on the affected air lock components.
2. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when air lock leakage results in exceeding the overall containment leakage rate.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment air lock door inoperable.	-----------NOTES----------- 1. Required Actions A.1, A.2, and A.3 are not applicable if both doors are inoperable and Condition C is entered. 2. Entry and exit is permissible for 7 days under administrative controls. ---------------------------	
	A.1 Verify the OPERABLE door is closed.	1 hour
	<u>AND</u>	
	A.2 Lock the OPERABLE door closed.	24 hours
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 --------NOTE-------- Air lock doors in high radiation areas may be verified locked closed by administrative means. ------------------- Verify the OPERABLE door is locked closed.	 Once per 31 days
B. Containment air lock interlock mechanism inoperable.	-----------NOTES----------- 1. Required Actions B.1, B.2, and B.3 are not applicable if both doors are inoperable and Condition C is entered. 2. Entry and exit of containment is permissible under the control of a dedicated individual. ---------------------------	
	B.1 Verify an OPERABLE door is closed.	1 hour
	<u>AND</u>	
	B.2 Lock an OPERABLE door closed.	24 hours
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.3	--------NOTE-------- Air lock doors in high radiation areas may be verified locked closed by administrative means. -------------------- Verify an OPERABLE door is locked closed.	Once per 31 days
C. Containment air lock inoperable for reasons other than Condition A or B.	C.1	Initiate action to evaluate overall containment leakage rate per LCO 3.6.1.	Immediately
	<u>AND</u>		
	C.2	Verify a door is closed in the air lock.	1 hour
	<u>AND</u>		
	C.3	Restore air lock to OPERABLE status.	24 hours
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	D.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	-------------------NOTES------------------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria of SR 3.6.1.1, in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions. --- Perform required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.	-----NOTE----- SR 3.0.2 is not applicable -------------- In accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	24 months

16. Given the following plant conditions:

- Crew is reducing power to 70% from 100% in response to an MSR intercept valve problem in accordance with OP-105, MANEUVERING THE PLANT WHEN GREATER THAN 25% POWER
- Crew started a second charging pump and placed a second letdown orifice in service for the power change
- At 80% reactor power, R-9 (Letdown Line Area Radiation Monitor), alarmed
- Crew reduced letdown to a single orifice in accordance with AOP-005, "Radiation Monitoring System"

Which ONE (1) of the following describes the basis for the requirement to reduce letdown flow based on the above information?

A. R-9 readings are normalized for a 45 gpm orifice in service.

B. Reduces the depletion rate of the mixed bed ion exchanger.

C. Reduces the amount of radionuclides recirced throughout the auxiliary building.

D. Allows a quicker sample purge to be done to obtain the required Iodine sample.

17. Given the following plant conditions:

- Mode 1 at 70% RTP
- Crew is performing a plant startup per GP-005, POWER OPERATION, to 100%
- Reactor operator withdraws control rods 5 steps for temperature control

Which ONE (1) of the following describes the plant response?

A. Feed regulating valves open to maintain S/G levels on program.

B. S/G pressure increases because the turbine is operating in IMP-IN.

C. Load increases due to the higher steam flow provided to the turbine.

D. Turbine governor valves throttle closed because the turbine is operating in IMP-OUT.

18. Given the following plant conditions:

- A plant startup per GP-005, POWER OPERATION, to 100%, is in progress
- Current reactor power is 7%.
- Reactor Operator withdraws control rods three (3) steps for temperature control. Upon releasing the Rod Control switch, control rods continue to withdraw

Which ONE (1) of the following describes the correct operator response to this event?

A. Trip the reactor.

B. Attempt to insert rods by placing the Rod Control switch to IN.

C. Attempt to stop outward motion by depressing the Auto Rod Defeat button.

D. Attempt to stop outward motion by placing Rod Bank Selector switch in AUTO.

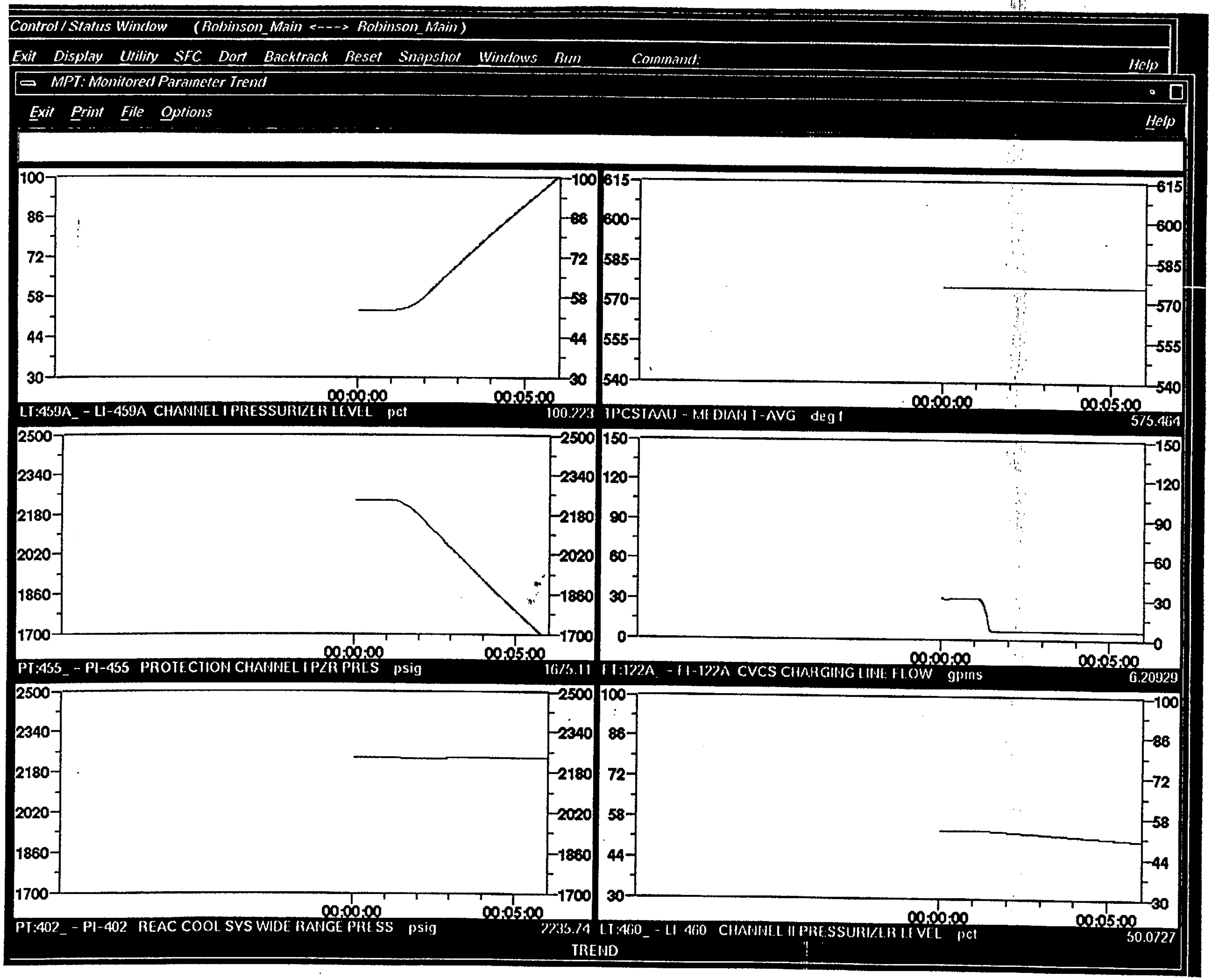
19. Using the attached parameter plots, which ONE (1) of the following describes the current RCS status?

    A. PZR Steam space leak.

    B. Leaking spray valve.

    C. PZR reference leg leak

    D. Leak from high pressure sensing line of LT-459



Control / Status Window (Robinson_Main <---> Robinson_Main)
Exit Display Utility SFC Dort Backtrack Reset Snapshot Windows Run Command: Help
MPT: Monitored Parameter Trend
Exit Print File Options Help
LT:459A_ - LI-459A CHANNEL I PRESSURIZER LEVEL pct 100.223
TPCSTAAU - MEDIAN T-AVG deg f 575.464
PT:455_ - PI-455 PROTECTION CHANNEL I PZR PRES psig 1675.11
FT:122A_ - FI-122A CVCS CHARGING LINE FLOW gpms 6.20929
PT:402_ - PI-402 REAC COOL SYS WIDE RANGE PRESS psig 2235.74
LT:460_ - LI-460 CHANNEL II PRESSURIZER LEVEL pct 50.0727
00:00:00
00:05:00
TREND

20. Given the following plant conditions:

- The crew is in Path 1
- RCS temperature is 385°F
- RCS pressure is 100 psig
- Containment pressure is 24 psig
- Off-site power is not available due to storm damage
- "A" EDG is inoperable
- "B" EDG is running
- The "B" EDG trips due to a transient. Six minutes later, it is restarted

Which ONE (1) of the following describes the required response of the crew with regards to the CCW system as a result of the above?

A. Start "C" CCW pump.

B. Do not attempt to restore CCW flow.

C. Verify "C" CCW pump restarted via the SI sequencer when power was restored.

D. Verify "C" CCW pump restarted via the Blackout sequencer when power was restored.

21. Given the following plant conditions:

- Mode 3, GP-002, COLD SHUTDOWN TO HOT SUBCRITICAL AT NO-LOAD TAVG, is in progress
- RCS temperature is 500°F
- An SI has occurred due to a failed S/G "A" safety valve
- "A" S/G has been isolated, EPP-11, FAULTED S/G ISOLATION, is completed
- APP-001-D5, RHR PIT B HI-HI LEVEL, illuminates

Which ONE (1) of the following provides the required crew response?

A. Enter AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE

B. Enter EPP-24, ISOALTION OF LEAKAGE IN THE RHR PUMP PIT via Foldout A

C. Enter AOP-033, SHUTDOWN LOCA

D. Enter EPP-24, ISOALTION OF LEAKAGE IN THE RHR PUMP PIT via Foldout B

22. Given the following plant conditions:

- A reactor trip and SI have occurred
- Crew has responded IAW the EOP network
- Crew has entered EPP-9, TRANSFER TO COLD LEG RECIRCULATION due to low RWST level
- Shortly after entering EPP-9, the crew transitions to EPP-15, "LOSS OF EMERGENCY COOLANT RECIRCULATION"

Which ONE (1) of the following states conditions that would have warranted this transition to EPP-15?

A. Loss of E-1 and SI-759B failed closed.

B. Loss of E-2 and SI-759B failed closed.

C. Loss of E-1 and SI-861A failed closed.

D. Loss of E-2 and SI-861A failed closed.

23. Given the following plant conditions:

- A reactor trip and SI have occurred
- Crew has responded IAW the EOP network
- All RCP's have been secured
- EPP-007, SI TERMINATION, is in progress
- SI, Phase A, and Phase B have been reset

Which ONE (1) of the following describes the minimum plant conditions and the basis for starting an RCP?

A. RVLIS Upper Range > 100% **and** PZR level > 66%; Collapse void in the reactor vessel head.

B. RVLIS Upper Range > 100% **or** PZR level > 66%; Collapse void in the reactor vessel head.

C. RVLIS Full Range > 100% **and** RCS subcooling > 59 degrees; Establish saturated conditions in the PZR.

D. RVLIS Full Range > 100% **or** RCS subcooling > 59 degrees; Establish saturated conditions in the PZR.

24. Given the following plant conditions:

- Mode 1 at 100% RTP
- Two letdown orifices are in service; CVC-200A, 45 GPM ORIFICE ISOLATION, and CVC-200B, 60 GPM ORIFICE ISOLATION
- Pressurizer level is on program
- "A" charging pump is running in automatic
- "B" charging pump is in manual (45 gpm flow through the pump)
- All Seal Injection flows are 8 gpm each
- All Seal Return flows are 3 gpm each

Which ONE (1) of the following describes a correct plant response to a loss of electrical power to CVC-200A with **no operator action**?

If LC-459G, Pressurizer Level controller, is in:

A. automatic, the reactor will trip as a result of CVC-200A closing.

B. manual, the reactor will trip as a result of CVC-200A closing.

C. automatic, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

D. manual, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

25. Given the following plant conditions:

- RCS pressure is 1750 psig and slowly decreasing
- Reactor power is 100% RTP
- Reactor operator is unsuccessful in tripping the reactor

Which ONE (1) of the following contains only operator immediate actions required for these conditions?

A. Check turbine trip, verify E1 and E2 energized.

B. Insert control rods and dispatch an operator to the MG set room to trip the reactor trip breakers.

C. Initiate emergency boration.

D. Insert control rods and dispatch an operator to the MG set room to trip Rod Drive Motor Generator set supply breakers.

26. Given the following plant conditions:

- The plant is shutdown < 200°F for refueling
- Preparations for head disassembly are in progress
- SRNI counts are:
  N31 = 900 cps
  N32 = 975 cps
- APP-005-C1, SR HI FLUX AT SHUTDOWN, is received

Which ONE (1) of the following describes a possible cause for the alarm?

A. Count rate on N31 increases to 1825 cps.

B. A source range detector cable is severed.

C. A SRNI detector voltage drifts low.

D. A SRNI detector voltage drifts high.

27. Given the following plant conditions:

- A plant startup is in progress IAW GP-005, POWER OPERATION
- The unit is at 50% RTP

Using Attachment 6.1 (PROVIDED), which ONE (1) of the following describes the attachment when the Manager - Operations was required to be notified?

A. Row A

B. Row B

C. Row C

D. Row D

oint in the

REACTOR POWER ASCENSION INDICATOR LOG

	AVG PWR % (1)	NI-35 amps	NI-36 amps	NI-41A %	NI-42A %	NI-43A %	NI-44A %	LOOP ΔT °F (1)	LOOP 1 ΔT °F	LOOP 2 ΔT °F	LOOP 3 ΔT °F	1st STAGE PRESS psig (1)	PI-446 OR 447 psig (2)	NET MWe MAX (1)	NET MWe	CCP % PWR (3)	NR-45 (4)	SSO (1)
A	15-20	6.0×10^{-5}	6.0×10^{-5}	18	16	16	15	9-11.5	10.5	11	11.3	68-90	75	73	50	16.7	16.5	[illegible]
B	25-30	1.0×10^{-4}	1.0×10^{-4}	29	28	29	29	14.5-17	17	17	17	113-135	135	153	150	28	29.5	[illegible]
C	35-40	1.3×10^{-4}	1.3×10^{-4}	39	36	38	33.5	20-23	22	22	22.5	158-180	165	235	205	36	36.5	[illegible]
D	45-50	1.6×10^{-4}	1.7×10^{-4}	48	48	46	47	26-28.5	27.5	27.5	28.5	207-230	230	316	305	48	47.0	[illegible]
	55-60							32-34.5				261-285		398				
	65-70							37-40				320-345		480				
	75-80							43-46				384-410		562				
	85-90							49-51.5				449-475		643				
	95-100							55-57.5				513-540		725				

(1) Listed ranges and Net MWe maximums are predicted based on past plant performance. The maximum value of each indication is the maximum target value for each power increase. The SSO shall initial if plant management has determined that indications are acceptable to continue with the power escalation.

(2) Use indicator that corresponds to the channel selected on the 1st STAGE PRESSURE selector switch.

(3) Record Continuous Calorimetric Program % Power.

(4) Verify NR-45 is selected to the highest reading channel.

28. Given the following plant conditions:

- The crew is responding to multiple accident conditions
- S/G "C" is ruptured
- Path 2 has been entered and preparations are being made for dumping steam at the maximum rate from the intact S/G's
- Containment Pressure is 3.0 psig after peaking at 4.7 psig
- RCS Tcold is 492°F
- "C" S/G prssure is 250 psig above non-ruptured S/G pressure

Which ONE (1) of the following describes the required core exit temperature? Use the Attached table to make your determination.

A. 415°F

B. 435°F

C. 445°F

D. 465°F

From Path-2

DETERMINE REQUIRED CORE EXIT TEMP	
RUPTURED S/G PRESS (PSIG)	REQUIRED CORE EXIT TEMP (^{o}F)
GREATER THAN 1000	490 [470]
900 - 1000	480 [460]
800 - 899	465 [445]
700 - 799	450 [430]
600 - 699	435 [415]
500 - 599	415 [395]
400 - 499	395 [375]
300 - 399	365 [345]
250 - 299	340 [320]

29. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" condensate pump trips

Which ONE (1) of the following describes the **initial** feedwater system response to the above condition with **no operator action**?

All S/G feedwater regulating valves will:

A. close and both main feedwater pumps will trip.

B. close and only "A" main feedwater pump will trip.

C. open and only "A" main feedwater pump will trip.

D. open and both main feedwater pumps will trip.

30. Given the following plant conditions:

- A reactor trip and SI have occurred
- AFW flow < 300 gpm
- S/G WR levels are : "A"= 24%, "B"= 25%, "C" = 27%
- RCP's are secured
- RCS pressure is 2285 psig and increasing
- Crew initiates RCS bleed and feed

Which ONE (1) of the following describes the plant parameter/setpoint that directed the initiation of bleed and feed **and** the basis for it?

A. RCS pressure greater than 2280 psig; PZR PORV capability.

B. RCS pressure greater than 2280 psig; indication of imminent PORV lift.

C. 2 S/G WR levels less than 26%; PZR PORV capability.

D. 2 S/G WR levels less than 26%; indication of imminent S/G dryout.

31. Given the following plant conditions:

- Mode 1 at 100% RTP
- No scheduled releases are in progress
- A small leak develops from the bottom of Waste Condensate Tank "A"
- All ventilation systems are in a normal configuration

Which ONE (1) of the following identifies an indication that would alert the operators of an accidental liquid release in progress?

An increase in the level of monitor:

A. R-3, PASS Panel Area Monitor.

B. R-9, Letdown Line Area Monitor.

C. R-4, Charging Pump Room Area Monitor.

D. R-14C, Plant Effluent Noble Gas, Low Range Monitor.

32. Given the following plant conditions:

- Waste Gas Decay Tank (WGDT) "A" is the IN SERVICE tank and has an identified leak
- Waste Gas Decay Tank "B" is in STANDBY and will be placed IN SERVICE per AOP-009, ACCIDENTAL GAS RELEASE FROM A WGDT

Which ONE (1) of the following correctly describes the basis for placing Waste Gas Decay Tank "B" IN SERVICE instead of Waste Gas Decay Tanks "C" or "D" under these conditions?

A. All actions can be performed from the Waste Disposal Boron Recycle Panel. The operator does not have to enter the WGDT Valve Gallery which may be a high airborne area.

B. Most actions can be performed from the Waste Disposal Boron Recycle Panel. The operator has to spend limited time in the WGDT Valve Gallery which may be a high airborne area.

C. All actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

D. Most actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

33. Which ONE (1) of the following lists the RMS channels designed to provide indication during and after an accident when radiation levels and/or environmental specifications of the other channels may be exceeded?

1. R-1, Control Room
2. R-2, CV Low Range Monitor
3. R-11, CV Air or Plant Stack, Particulate
4. R-12, CV Air or Plant Stack, Noble Gas
5. R-14C, Plant Stack, Noble Gas, Low Range
6. R-14D, Plant Stack, Noble Gas, Intermediate or Mid Range
7. R-14E, Plant Stack, Noble Gas, High Range
8. R-30, Fuel Handling Building, Lower Level, High Range Noble Gas
9. R-31A, B, C Main Steam Lines
10. R-32A, B CV High Range

A. 3, 4, 6, 7, 9, 10

B. 1, 5, 6, 8, 9, 10

C. 2, 6, 7, 9, 10

D. 6, 7, 8, 9, 10

34. Given the following plant conditions:

- Mode 1 at 100% RTP
- LT 459, Pressurizer Level Transmitter, has failed low
- Crew enters AOP-025, "RTGB INSTRUMENT FAILURE"
- An operable level channel is selected and APP-003-C3, PRT HI PRESS, is received

Which ONE (1) of the following describes the cause of the PRT alarm?

CVC-460 A&B, LETDOWN ISOLATION STOPS
CVC-203A, LETDOWN RELIEF
CVC-209, LP LETDOWN RELIEF

A. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-203A lifted.

B. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-209 lifted.

C. Letdown isolation caused CVC-209 to lift.

D. Letdown isolation caused CVC-203A to lift.

35. Given the following plant conditions:

- The plant was operating at 100% RTP
- All systems are in their normal configuration
- A Loss of Off-Site Power occurred and EPP-1, LOSS OF ALL AC POWER, was entered
- The EDG's have been started from the RTGB and the output breakers closed
- Service Water pumps have been started by the blackout sequencer
- An SI occurs immediately after SW pumps started

Which ONE (1) of the following describes the response to this event?

The Blackout sequence will:

A. continue to completion, any additional equipment will be started by the SI sequence.

B. continue to completion, any additional equipment will require a manual start.

C. stop, all loads will be stripped and restarted by the SI sequence.

D. stop, the SI sequence will start the required additional loads.

36. Given the following plant conditions:

- FRP-H.2, RESPONSE TO S/G OVERPRESSURE, is in effect
- STA is monitoring CSFST's
- The crew is monitoring the affected S/G level as directed by procedure

Which ONE (1) of the following correctly describes the importance for monitoring level?

A. When S/G level is > 75%, S/G may be water solid, stay in FRP-H.2.

B. When S/G level is > 90%, S/G may be water solid, transition to FRP-H.3, Response to Steam Generator High Level.

C. When S/G level is > 75%, S/G PORV may be water solid, transition to FRP-H.3, Response to Steam Generator High Level.

D. When S/G level is > 90%, S/G PORV may be water solid, stay in FRP-H.2.

37. Given the following plant conditions:

- Mode 1 at 60% RTP
- The rods are selected to MANUAL
- Control rod (M-6) drops to the bottom of the core

Which ONE (1) of the following describes the integrated plant response to the rod drop and the reason for the response? **(Assume no operator action)**

A. APP-003-F3, CHG PMP LO SPEED, illuminates due to the reactivity inserted by the dropped rod.

B. APP-003-F3, CHG PMP LO SPEED, illuminates due to mismatch between reactor power and steam demand.

C. APP-003-F4, CHG PMP HI SPEED, illuminates due to mismatch between reactor power and steam demand.

D. APP-003-F4, CHG PMP HI SPEED, illuminates due to the reactivity inserted by the dropped rod.

38. Given the following plant conditions:

- Mode 1 at 95% RTP
- A flux tilt of 1.038 exists
- Rod K-14 appears to be misaligned
- This condition cannot be corrected for at least 2.5 hours

Using ITS 3.2.4 (ATTACHED), which ONE (1) of the following correctly describes the correct power reduction?

Reduce core power to:

A. 98.8%.

B. 94.8%.

C. 88.6%.

D. 83.6%.

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be ≤ 1.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPTR not within limit.	A.1 Reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	2 hours
	AND	
	A.2 Determine QPTR and reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	Once per 12 hours
	AND	
	A.3 Perform SR 3.2.1.1 and SR 3.2.2.1.	24 hours AND Once per 7 days thereafter
	AND	
	A.4 Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
	AND	

(continued)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.4.1	-----NOTES----- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER < 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. ---------- Verify QPTR is within limit by calculation.	7 days <u>AND</u> Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable.
SR 3.2.4.2	-----NOTE----- Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER ≥ 75% RTP. ---------- Verify QPTR is within limit using the movable incore detectors.	Once within 12 hours <u>AND</u> 12 hours thereafter

39. Given the following plant conditions:

- Mode 1 at 35% RTP
- Two charging pumps are running
- The following RCP indications are observed:

	RCP "A"	RCP "B"	RCP "C"
o RCP motor bearing temperatures	180°F	180°F	210°F
o #1 seal leakoff temperatures	150°F	150°F	165°F
o Thermal barrier delta P	10"	10"	8"

Which ONE (1) of the following describes the action(s) required for this condition?

A. Stop "C" RCP, shutdown IAW GP-006, Normal Plant Shutdown From Power Operation To Hot Shutdown, and be in Mode 3 within 6 hours.

B. Throttle CVC-297C, "C" RCP Seal Water Flow Control valve, to obtain between 8 and 13 gpm flow to each "C" RCP Seals.

C. Close CVC-303C, "C" RCP Seal Leakoff valve.

D. Trip the reactor, stop RCP "C".

40. Given the following plant conditions:

- Plant has experienced a loss of off-site power
- Reactor trip & turbine trip have been verified
- Crew entered EPP-1, LOSS OF ALL AC POWER, until the inside AO restored power to E-2 per Attachment 6 of EPP-1.
- Crew has returned to Path-1
- No SI has occurred or is required

Which ONE (1) of the following correctly describes how "Verify two charging pumps running" of PATH-1 will be completed?

Operator will start ___ charging pump from the "B" EDG and then ____charging pump from the DS bus after energizing it from the DS EDG per EPP-25, ENERGIZING SUPPLEMENTAL PLANT EQUIPMENT USING THE DSDG

A. "B" ; "A"

B. "C" ; "B"

C. "B" ; "C"

D. "C" ; "A"

41. Given the following plant conditions:

- The RCS is on RHR and solid
- RCS pressure is 350 psig
- RCS temperature is stable
- HIC-142, LETDOWN, controller setting is at 40% demand
- PC-145, PRESSURE, is in AUTO
- The Reactor operator adjusts HIC-142 controller to 80% demand

Which ONE (1) of the following statements is correct?

A. Letdown pressure increases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure decreases.

B. Letdown pressure increases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure decreases.

C. Letdown pressure decreases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure increases.

D. Letdown pressure decreases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure increases.

42. Given the following plant conditions:

- A DBA LOCA has occurred
- An electrical fault results in a loss of E-1

Which ONE (1) of the following describes the effects of the loss of E-1 on containment conditions?

A. Adequate equipment is operating to provide the required cooling for containment in this event.

B. Inadequate SW booster pumps are operating to maintain containment conditions within design limits.

C. Inadequate CV spray pumps are operating to maintain containment conditions within design limits.

D. Inadequate HVH units are operating to maintain containment conditions within design limits.

43. Given the following plant conditions:

- Reactor trip and SI have occurred
- Failure of SI status lights has occurred
- CRSS has directed the RO to verify the CVCS related SI valves CLOSED using RTGB indication

Which ONE (1) of the following correctly describes the CVCS valves required to be verified closed?

A. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Line Isol valves (CVC-204A & 204B)

B. Letdown Line Isol valves (CVC-204A & 204B) and Letdown Stop valves (CVC-460A & 460B)

C. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Stop valves (CVC-460A & 460B)

D. Letdown Line Isol valves (CVC-204A & 204B) and Seal Water Return Isol valve (CVC-381)

44. Given the following plant conditions;

- Mode 1 at 100% RTP
- All control systems are in automatic

Assuming no operator action, which ONE (1) of the following describes the response of the rod control system if Power Range Nuclear Instrument Channel N-44 fails full upscale?

A. No rod movement will occur because of the Overpower rod stop from N-44 failure.

B. Nuclear power - Turbine power mismatch signal steps rods in until the signal decays, then rod motion stops.

C. Nuclear power - Turbine power mismatch signal steps rods in until the Tavg-Tref mismatch signal overrides it.

D. Nuclear power - Turbine power mismatch signal steps rods in as long as N-44 is energized.

45. Given the following plant conditions:

- The plant was initially at 95% RTP and increasing following a refueling outage
- The reactor has tripped
- Compensating voltage on N-35, Intermediate Range NI, is set too high

Which ONE (1) of the following describes the response of Intermediate Range N-35 to the improperly set compensating voltage?

A. Indicates LOW; causing P-6 to energize the Source Range instruments prematurely.

B. Indicates HIGH; preventing P-6 from automatically energizing the Source Range instruments.

C. Indicates HIGH; the Source Range instruments will be energized by P-6 from the other IR channel (N-36).

D. Indicates LOW; the Source Range instruments will be energized when P-6 is satisfied by the other IR channel (N-36).

46. Given the following plant conditions:

- Mode 1 at 100% RTP
- An NAS Assessment identifies that the feedwater temperature indicators are inaccurate
- It is determined that the feedwater temperature detectors show an indicated temperature that is LOWER than ACTUAL
- These readings were used in OST-10, POWER RANGE CALORIMETRIC DURING POWER OPERATION DAILY
- The power range detectors were adjusted using the OST

Which ONE (1) of the following correctly describes the results of the feedwater error on the power range calorimetric?

Indicated power is _______ than ~~calculated~~ power causing a _______ conservative NI setting.
actual

A. LOWER; MORE

B. HIGHER; MORE

C. LOWER; LESS

D. HIGHER; LESS

47. Given the following plant conditions:

- APP-036-01, CH A ICCM SYS MALF is illuminated

Which ONE(1) of the following describes the RVLIS component that could cause this alarm to actuate and what condition is it indicating?

A microswitch located in the:

A. Sensor Bellows; RCS leak.

B. Sensor Bellows; capillary line leak.

C. Hydraulic Isolator; RCS leak.

D. Hydraulic Isolator; capillary line leak.

48. Which ONE (1) of the following describes the difference between an automatic and a manual spray actuation?

A. Containment Phase B Isolation and Containment Ventilation Isolation only occur on a manual actuation.

B. Containment Phase B Isolation and Containment Ventilation Isolation only occur on an automatic actuation.

C. Safety Injection and Steamline Isolation only occur on a manual actuation.

D. Safety Injection and Steamline Isolation only occur on an automatic actuation.

49. Given the following plant conditions:

- Crew is in FRP-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL
- S/G levels are as follows:

	S/G "A"	S/G "B"	S/G "C"
◊ Wide range levels	27%	7%	29%

- AFW flowrate to each S/G is 70 gpm

Which ONE (1) of the following defines the maximum allowed AFW flow rates to the S/G's?

Establish AFW flow:

A. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 80 gpm to S/G "B" until WR level is >9%.

B. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 100 gpm to S/G "B" until WR level is >9%.

C. less than or equal to 80 gpm to each S/G until NR level is >10%.

D. less than or equal to 100 gpm to each S/G until NR level is >10%.

50. Given the following plant conditions:

- Mode 1 at 30% RTP
- A reactor trip occurs
- All systems operate as expected
- Tave = Tref.

Which ONE (1) of the following correctly describes the status of secondary plant components for the above conditions?

A. Feed regulating valves are open, feed regulating bypass valves are open.

B. Feed regulating valves are open, feed regulating bypass valves are closed.

C. Feed regulating valves are closed, feed regulating bypass valves are open.

D. Feed regulating valves are closed, feed regulating bypass valves are closed.

51. Given the following plant conditions:

- The plant has experienced a reactor trip and safety injection
- Foldout "A" is in effect
- Condensate Storage Tank level is 8%
- RCS temperature is 475°F

FCV-6416, SDAFW PUMP DISCHARGE FLOW CONTROL VALVE
FCV-1424, "A" MDAFW PUMP DISCHARGE FLOW CONTROL VALVE
FCV-1425, "B" MDAFW PUMP DISCHARGE FLOW CONTROL VALVE

Which ONE (1) of the following describes the applicable AFW flowrate limitation **and** the basis for the limitation?

If only the :

A. SDAFW pump is running, then FCV-6416 is set at 600 gpm to prevent exceeding the maximum flow delivery rate of the Service Water system.

B. SDAFW pump is running, then FCV-6416 is set at 500 gpm to ensure that the maximum design flowrate to a faulted S/G will not be exceeded.

C. MDAFW pumps are running, then FCV-1425, is set at 325 gpm and FCV-1424 is set at 155 gpm to prevent exceeding the maximum flow delivery rate of the Service Water system and runout of "~~A~~" MDAFW pump.
B

D. MDAFW pumps are running, then FCV-1424 is set at 325 gpm and FCV-1425 is set at 275 gpm to prevent exceeding the maximum flow delivery rate of the Service Water system and runout of "A" MDAFW pump.

52. Which ONE (1) of the following describes the basis for the length of time for which Station Battery capacity is designed?

A. Need 1 train to shutdown the reactor and maintain it in a safe condition for 1 hour after a DBA.

B. Need 2 trains to shutdown the reactor and maintain it in a safe condition for 1 hour after a DBA.

C. Need 1 train to shutdown the reactor and maintain it in a safe condition for 2 hours after a DBA.

D. Need 2 trains to shutdown the reactor and maintain it in a safe condition for 2 hours after a DBA.

53. Given the following plant conditions:

- GP-002, COLD SHUTDOWN TO HOT SUBCRITICAL AT NO LOAD Tavg, is in progress
- All systems are in a normal lineup for the plant condition

Which ONE (1) of the following describes an action that would cause PCV-1027, COVER GAS HEADER PRESSURE CONTROL, to automatically close?

A. An automatic makeup.

B. Dilution to Mode 3 SDM.

C. Processing of a CVCS Holdup Tank.

D. CVC-209, LP LETDOWN RELIEF, lifting.

54. Given the following plant conditions:

- Mode 1 at 100%
- A liquid and a gaseous release are in progress
- APP-010-B7, HVE-2A/B AIR FLOW LOST/OVLD, annuciator is illuminated
- Standby fan does not start

Which ONE (1) of the following correctly describes the proper crew response to this condition?

Secure the:

A. liquid rad waste release and notify RC Personnel of the possibility of an unmonitored release due to pressurization of the Auxiliary Building.

B. liquid rad waste release and notify RC Personnel of the possibility of forming a vacuum in the Auxiliary Building.

C. gaseous rad waste release and notify RC Personnel of the possibility of an unmonitored release due to pressurization of the Auxiliary Building.

D. gaseous rad waste release and notify RC Personnel of the possibility of forming a vacuum in the Auxiliary Building.

55. Given the following plant conditions:

- Mode 1 at 100% RTP
- A liquid release is in progress
- All systems are in a normal lineup and functioning properly

Which ONE (1) of the following identifies a Control Room indication that allows monitoring of the release?

A. Position of RCV-018, LIQUID WASTE EFFLUENT ISOLATION.

B. R-18, LIQUID WASTE DISPOSAL EFFLUENT.

C. YIC-1676, LIQUID RELEASE TOTALIZER.

D. FI-1064, RELEASE FLOW RATE.

56. Given the following plant conditions:

- Mode 3
- A release is in progress from "B" Waste Gas Decay Tank
- R-14C, PLANT STACK NOBLE GAS LOW RANGE, FAIL light illuminates

Which ONE (1) of the following conditions in the Control Room would also exist **and** what would be the effect of the above condition on RCV-014 (WASTE GAS RELEASE ISOLATION)?

A. APP-036-E7, RTGB RAD MONITOR TROUBLE; RCV-014 remains open.

B. APP-036-E7, RTGB RAD MONITOR TROUBLE; RCV-014 closes.

C. APP-036-D8, RTGB PROCESS MONITOR HI RAD; RCV-014 remains open.

D. APP-036-D8, RTGB PROCESS MONITOR HI RAD; RCV-014 closes.

57. Given the following plant conditions:

- Mode 1 at 100% RTP
- A release is in progress from Waste Gas Decay Tank "A"
- A loss of Instrument Bus 2 occurs

Which ONE (1) of the following describes the effect on the release based upon the instrument bus loss?

The release:

A. is automatically terminated due to loss of R-14 (PLANT VENT MONITOR).

B. must be manually terminated due to loss of R-14 (PLANT VENT MONITOR).

C. must be manually terminated due to loss power to the Waste Disposal Boron Recycle Panel.

D. is automatically terminated due to loss of power to the Waste Disposal Boron Recycle Panel.

58. Which ONE (1) of the following provides the basis for R-14D, Plant Vent Mid-Range Noble Gas, alarm setpoint?

A. 10CF20 most restrictive dose rate of 500 mr/yr total body.

B. 50 mr/hr at site boundary for a release of 30 minutes duration.

C. 3000 mr/yr to the skin.

D. 30 mr/hr at site boundary for a release of 1 hour duration.

59. Given the following plant conditions:

- Mode 5
- The RCP Seal Injection filter has just been changed out
- HP placed the filter in a one inch thick lead container
- Prior to placement of the container, R-4 read 1 mr/hr
- The container is on a pallet outside of the Charging Pump Room
- There is effectively 2 inches of steel between the container and the R-4 (CHARGING PUMP ROOM MONITOR) detector
- The activity source in the filter is primarily Cobalt-60
- The container is 8 feet away from R-4 detector, and R-4 reads 5 mr/hr

Which ONE (1) of the following identifies the correct R-4 reading if the container is moved to 16 feet away from R-4 detector?

A. 1.25 mr/hr

B. 2.0 mr/hr

C. 2.5 mr/hr

D. 3.0 mr/hr

60. During a drain of the RCS IAW GP-008, DRAINING THE REACTOR COOLANT SYSTEM, the hoses connected to the Pressurizer Relief loop seal drains are required to be removed after the seals are drained.

    Which ONE (1) of the following provides the correct reason for removing these hoses?

    A. AP-010, Housekeeping Instructions. Hoses are a trip hazard and want to minimize the potential for falls inside Containment.

    B. Radiactive material issue. Need the hoses for additional drains which minimizes the amount of radioactive hoses generated by not having seperate hoses for each drain evolution.

    C. MMM-010, Cleanliness and Flushing. If end of hose became submerged, could siphon water from the floor drain into the RCS and introduce contaminants.

    D. Vent path concern. Eliminates the potential for hose collapse which would prevent air draw.

61. Given the following plant conditions:

- Shutdown following a reactor trip and safety injection
- RCS pressure is 5 psig
- EPP-10, TRANSFR TO LONG TERM RECIRCULATION, is in progress
- SI-869, SI HOT LEG HDR, is open
- SI-866A, LOOP 3 HOT LEG INJ, is open
- RHR pump "A" is started
- SI pump "A" is started
- You are unable to start an additional SI pump

The procedure directs you to establish Alternate Hot Leg Recirc. Which ONE (1) of the following describes the correct lineup for ECCS based on the above conditions?

A. No SI pump, SI-869 closed and RHR-750 and RHR-751, RHR LOOP SUPPLIES, opened.

B. One SI pump; RHR-759A and RHR-759B, RHR HX DISCHARGES, throttled open.

C. No SI pump, SI-869 closed and SI-863A, RHR LOOP RECIRC, opened.

D. One SI pump; SI-866B, LOOP2 HOT LEG INJ, opened.

62. Which ONE (1) of the following identifies the correct power supply to the Master Pressure Controller?

A. Instrument Bus #3

B. Instrument Bus #4

C. Instrument Bus #5

D. Instrument Bus #6

63. Given the following plant conditions:

- Mode 1 at 100% RTP
- PC-444J fails high

Which ONE (1) of the following describes the correct plant response if <u>**NO**</u> operator actions are taken?

A. All pressurizer heaters energize as plant pressure decreases.

B. Pressurizer Spray valves shut and the PORV's cycle to control pressure.

C. A reactor trip and safety injection occur on low Pressurizer pressure.

D. An OPΔT trip occurs.

64. Given the following plant conditions:

- Mode 1 at 100% RTP
- The crew is making preparations to commence a normal shutdown. A boration is in progress
- As part of the preparations, an additional letdown orifice is being placed in service
- The operator misses the step to adjust charging flow to match the expected letdown flow

Which ONE (1) of the following describes a plant response/indication resulting from the missed step?

A. VCT level decreases.

B. Charging pump speed decreases.

C. APP-001-B6, LP LTDN LN HI TEMP, illuminated.

D. TCV-143, VCT/DEMINERALIZER DIVERSION, diverts to VCT.

65. Given the following plant conditions:

- Mode 1
- A normal plant shutdown IAW GP-006 is in progress
- NIS: N41 = 9%, N42 = 9%, N43 = 9%, N44 = 10%
- Turbine first stage pressure is 60 psig
- "B" RCP trips due to a breaker malfunction

Which ONE (1) of the following describes the plant condition?

The plant is:

A. greater than P-7. The reactor trips.

B. greater than P-7. The reactor does not trip.

C. less than P-7. The reactor trips.

D. less than P-7. The reactor does not trip.

66. Which ONE (1) of the following describes the relationship between Individual Rod Position Indication (IRPI) and its associated Group Step Counter?

A. IRPI uses a completely independent signal from the Group Step Counters.

B. IRPI develops an output signal from an input signal provided by the Group Step Counters.

C. The Group Step Counters and IRPI both receive the same input signal and develop individual outputs.

D. The Group Step Counters develop an output signal from an input signal provided by IRPI.

67. Given the following plant conditions:

- Mode 4 for a forced outage
- Maintenance work is being performed on HVH-1, CV Air Recirculation Cooling
- A fire breaks out in Station Service Transformer 2G
- EDG "B" starts, trips off, and can not be restarted

Using the copy of ITS 3.6.6 provided, which ONE (1) of the following describes the action that must be taken based upon the current plant conditions?

A. Restore at least one Containment cooling train to service within 72 hours

B. Restore CV spray train to service within 72 hours

C. Enter LCO 3.0.3

D. Be in Mode 5 in 84 hours

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray and Cooling Systems

LCO 3.6.6 Two containment spray trains and two containment cooling trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet the LCO
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours
C. One containment cooling train inoperable.	C.1 Restore containment cooling train to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two containment cooling trains inoperable.	D.1 Restore one containment cooling train to OPERABLE status.	72 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours
F. Two containment spray trains inoperable. OR Any combination of three or more trains inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray 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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.2	Operate each containment cooling train fan unit for ≥ 15 minutes.	31 days
SR 3.6.6.3	Verify cooling water flow rate to each cooling unit is ≥ 750 gpm.	31 days
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.6.6.7	Verify each containment cooling train starts automatically on an actual or simulated actuation signal.	18 months
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	10 years

68. Given the following plant conditions:

- Mode 1 at 100% RTP
- The daytime temperature is 105°F, CV pressure reads 0.2 psig
- The predicted night time low is 55°F with a high pressure area.

Which ONE (1) of the following describes the expected response of CV pressure **and** applicable required actions?

A. Increase, no actions required.

B. Increase, open CV vacuum reief valves.

C. Decrease, open CV vacuum relief valves.

D. Decrease, verify CV vacuum valves open automatically.

69. Given the following plant conditions:

- Waste Holdup Tank (WHUT) level is increasing faster than normal
- Auxiliary Building Sump pumps "C" and "D" have been operating more frequently than normal

Which ONE (1) of the following describes a plant condition that, **without operator action**, would cause the above?

A. A leak in the SFP liner.

B. A leak from RHR pump "A" seal.

C. SFPC-805B, RWST RETURN, not fully seated, causing the RWST to overflow.

D. A demineralized water leak in the E/RC building.

70. Which ONE (1) of the following will cause a change in the amount of natural circulation cooling?

A. A change in S/G level from 50% NR to 20% NR.

B. A change in S/G level from 75%WR to 40%WR.

C. Go from 45% Pressurizer level to 92% RVLIS Full Range.

D. Go from 70% RVLIS Full Range to 90% RVLIS Full Range.

71. Given the following plant conditions:

- RCS T-cold is 175°F, Pressure is 345 psig
- RHR is aligned for core cooling
- "A" RHR is running, "B" RHR is in standby
- "A" S/G is drained for maintenance
- "C" S/G is drained for maintenance
- It is desired to place "B" RHR pump out of service to conduct maintenance scheduled to take 6 hours

Which ONE (1) of the following describes the condition that must be satisfied in the "B" S/G in order to allow the RHR maintenance without entering an LCO?

Operable with:

A. level at least 10% (NR).

B. level at least 16% (NR).

C. temperature not >50°F higher than RCS T-cold.

D. temperature not >50°F lower than RCS T-cold.

72. Given the following plant conditions:

- Mode 1 at 85% RTP
- LCV-1530A, HDT LEVEL CONTROL VALVE, air supply piping ruptures
- The AO is directed to isolate air to LCV-1530A to stop the leak
- The AO inadvertently isolates air to LCV-1530B, HEATER DRAIN PUMPS SUCTION DUMP TO CONDENSER

Which ONE (1) of the following describes how these valves respond to the above plant conditions ?

A. LCV-1530A closes and LCV-1530B opens.

B. LCV-1530A position does not change and LCV-1530B closes.

C. LCV-1530A opens and LCV-1530B closes.

D. LCV-1530A position does not change and LCV-1530B opens.

73. Given the following plant conditions:

- Mode 1 at 100% RTP
- Vacuum pump "A" is running
- Vacuum pump "B" is selected to AUTO

Which ONE (1) of the following describes the correct operation of the vacuum pumps?

A. At 25.5 inches Hg decreasing, "B" automatically starts and at 27.0 inches Hg increasing, "B" automatically stops.

B. At 25.5 inches Hg decreasing, "B" automatically starts and "B" must be manually stopped and returned to AUTO.

C. All running pumps will shift to "hogging" mode at 25 inches Hg decreasing.

D. All running pumps will shift to "jetting" mode at 27 inches Hg increasing.

74. Which ONE (1) of the following states the correct 480VAC bus supply for the "B" Spent Fuel Pit pump?

A. Bus 5

B. Bus 3

C. Bus 2

D. Bus 1

75. Given the following plant conditions:

- Mode 1 at 100% RTP
- Breaker 52/20, UAT TO 4160V BUS 4, trips on defect

Which ONE (1) of the following provides a correct plant response?

A. Loss of "A" condensate pump, "A" Feed pump auto trip, manual reactor trip required due to >80% RTP.

B. Automatic reactor trip due to >P-8 and loss of RCP "A".

C. Loss of "B" Feed pump, manual reactor trip not required due to automatic trip from loss of "C" RCP >P-8.

D. Automatic reactor trip due to >P-8 and loss of RCP "B".

76. Which ONE (1) of the following describes an effect of losing the "A" DC bus?

A. Safety injection actuates.

B. Safety injection will not automatically initiate.

C. EDG "A" starts automatically but does not flash.

D. EDG "A" starts automatically and flashes normally.

77. Given the following conditions:

- Mode 1 at 100% RTP
- You have been assigned to perform OST-401-2, EDG "B" Slow Speed Start
- Engine speed has just been adjusted to 60hz
- Recorded generator voltage is as follows:
  - 470v on Generator Panel Voltmeter
  - 478v on ERFIS Point DGV3027A

Which ONE (1) of the following describes the appropriate actions for these conditions?

EDG voltage is:

A. acceptable. Proceed with the OST.

B. not acceptable. Declare the EDG inoperable.

C. acceptable. Adjust voltage regulator to 480v.

D. not acceptable. Adjust voltage regulator to 480v.

78. Which ONE (1) of the following describes the correct location where the sample lines for R-16 (CV HVH COOLING WATER) tie into the Service Water system?

A. Downstream of the HVH unit discharge isolation valves, outside of the CV.

B. Downstream of the HVH unit discharge isolation valves, inside of the CV.

C. Upstream of the HVH unit discharge isolation valves, outside of the CV.

D. Upstream of the HVH unit discharge isolation valves, inside of the CV.

79. Which ONE (1) of the following describes a correct operation of the Motor Driven Fire Pump (MDFP)?

The MDFP :

A. must be manually started from the Control Room when any fire alarm is received.

B. is automatically started whenever Fire Header pressure falls to 115 psig.

C. is automatically started when any fire suppression system is manually actuated.

D. must be manually secured from the Control Room when fire water is no longer required.

80. Which ONE (1) of the following describes a plant condition where SI-863A and SI-863B (RHR TO SI AND CV SPRAY SUCTION) are closed?

A. Long-term recirc with RCS pressure <125 psig.

B. Long-term recirc with RCS pressure >125 psig.

C. High head-low flow injection.

D. RHR flow <1200 gpm.

81. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" CCW pump is running
- All equipment is in a normal lineup
- A lightning strike causes a major disruption on the grid
- The turbine trips due to the transient
- All off-site power is lost
- EDG "B" is under clearance

Which ONE (1) of the following describes which CCW pump(s) will be running two minutes after the trip?

A. No CCW pumps running.

B. "B" CCW pump running.

C. "A" CCW pump running.

D. "C" CCW pump running.

82. Which ONE (1) of the following describes the CV Hydrogen concentration that will require arrangements be made for delivery of the Hydrogen Recombiner following a SBLOCA?

A. 0.4% and stable.

B. 0.3% and increasing.

C. 7.0% and increasing.

D. 7.5% and decreasing.

83. Given the following plant conditions:

- Mode 1 at 100% RTP
- Control Rods are selected to MANUAL for performance of an OST
- A leak develops in the Electro-Hydraulic Control system
- Turbine load begins to slowly decrease
- APP-006-F5, STEAM DUMP ARMED, illuminates

Which ONE (1) of the following correctly describes the response of the steam dump control system?

A. Steam dump bank 1 modulating open.

B. Steam line PORVs modulating open.

C. Steam dump bank 1 tripped open.

D. Steam dump bank 2 modulating open.

84. Which ONE (1) of the following describes the Reactor Protection System Power Range High Flux Trip Low Trip?

A. Provides protection against power excursions > P-8.

B. Provides protection against reactivity excursions too rapid for OPΔT trips at low power.

C. Provides protection against reactivity excursions too rapid for OTΔT trips at low power.

D. Provides protection against power excursions during a startup.

85. Which ONE (1) of the following describes the design of the Service Water Booster Pumps?

A. With SI sequencer, will start regardless of suction pressure to maintain Service Water pressure inside CV during a DBALOCA.

B. With SI sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water pressure inside CV during a DBALOCA.

C. With Blackout sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water to at least one CV Air Recirculation unit.

D. With Blackout sequencer, will start regardless of suction pressure to maintain Service Water to at least one CV Air Recirculation unit.

86. Given the following plant conditions:

- Mode 1 at 100% RTP
- Condensate Polisher regeneration is in progress
- The Instrument Air system is in a normal lineup
- APP-002-D7, INST AIR COMP A/B OVLD, is received
- PI-1702, INSTRUMENT AIR HEADER PRESSURE, reads 93 psig, slowly decreasing
- The AO reports that the breaker for Instrument Air Compressor "B" is tripped

Which ONE (1) of the following describes the expected condition of the remaining Instrument Air compressors?

A. "A" running, "D" running and loaded.

B. "A" running, "D" running but unloaded.

C. "A" not running, "D" running and loaded.

D. "A" not running, "D" running but unloaded.

87. Given the following plant conditions:

- The Plant is shutdown following a reactor trip and safety injection
- CV pressure during the event peaked at 9 psig and now reads 3 psig
- You are directed by Path 1 to "RESET PHASE A AND PHASE B"

Which ONE (1) of the following describes the indications that you will see on the RTGB when this step is performed?

A. All of the Phase A&B component lights turn from pink to blue.

B. APP-002-D2, CV ISOL PHASE B, extinguishes.

C. APP-002-C2, CV ISOL PHASE A, extinguishes.

D. PCV-1716, INST AIR ISO TO CV, opens.

88. Which ONE (1) of the following describes a Grid System Alert condition and what may or may not be performed during this condition?

A. During a System Reliability Alert, delay High Risk surveillances with a frequency of longer than quarterly without including the 25% grace period.

B. During a System Economics Alert, reschedule High Risk quarterly surveillances without including the 25% grace period.

C. During a System Reliability Alert, perform weekly High Risk surveillances as scheduled.

D. During a System Economics Alert, all surveillance testing can be performed as scheduled.

89. Given the following plant conditions:

- You are in AOP-022, LOSS OF SERVICE WATER, SECTION "A"
- You have dispatched an operator to perform step 4
- PI-1684, SOUTH SW HEADER PRESSURE, indicates 37 psig and is stable
- "B" and "C" Circ water pumps are running

Using the attached AOP-022, SECTION "A", which ONE (1) of the following contains the correct actions that you should take in continuing with the procedure?

A. Perform RNO for step 5, go to step 9.

B. Perform steps 5 and 6, wait at step 7 until SW-188 is CLOSED, then go to step 9.

C. Perform RNO for step 5, perform step 6, go to step 9 while SW-188 is being CLOSED.

D. Once step 5 is completed, perform step 6, wait at step 7 until SW-188 is CLOSED, then go to step 8.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 1 of 4)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
1.	Verify The Following Valves - OPEN: • V6-12A, SW SOUTH HDR ISO • V6-12B, SW X-CONN • V6-12C, SW X-CONN	
2.	Perform The Following: a. Monitor SW Header pressure indications on PI-1616 AND PI-1684 b. Close V6-12D, SW NORTH HDR ISO	
3.	Evaluate SW Header Pressure Indications As Follows: • Check South SW Header pressure on PI-1684 - STABLE OR INCREASING • Check North SW Header pressure on PI-1616 - DECREASING	Perform the following: a. Open V6-12D. b. Go To Section B of this procedure.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 2 of 4)

****

CAUTION

Confined Space entry requirements must be observed to access the North SW Strainer Pit.

****

NOTE

- SW-188, NORTH HDR SUPPLY TO SCRN WASH & CW PMP GLAND SEAL, is located in the North SW Strainer Pit.
- SW-839 and SW-845, NORTH SW HEADER CHEMICAL INJECTION, are located above the North SW Strainer Pit on the North side.
- Key #91 OR the Security Key is required to acess the SW Strainer Pits.

4. Verify The Following Valves At The Intake Structure - CLOSED:
   - SW-188
   - SW-839
   - SW-845

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 3 of 4)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
5.	Check South SW Header Pressure On PI-1684 - BETWEEN 40 PSIG TO 50 PSIG	Perform one or both of the following to restore South SW Header pressure to between 40 psig and 50 psig: • Throttle SW flow from CCW Heat Exchanger A as follows: a. Open SW-271, ROOT VALVE PI-1619A. b. Throttle SW-739, CCW HEAT EXCHANGER "A" RETURN, to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619A. c. Close SW-271. <u>OR</u> • Throttle SW flow from CCW Heat Exchanger B as follows: a. Open SW-260, ROOT VALVE PI-1619B. b. Throttle SW-740, CCW HEAT EXCHANGER "B" RETURN, to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619B. c. Close SW-260.
6.	Check Circulating Water Pump Status - ANY RUNNING	Go To Step 9.
* 7.	Check SW-188 - CLOSED	<u>WHEN</u> SW-188 is closed, <u>THEN</u> perform Step 8. Go To Step 9.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 4 of 4)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
8.	Determine If Adequate Seal Water Is Available To Circulating Water Pumps As Follows: • APP-008-E4, CW PMP A SEAL WTR LOST - EXTINGUISHED AND • APP-008-E5, CW PMP B SEAL WTR LOST - EXTINGUISHED AND • APP-008-E6, CW PMP C SEAL WTR LOST - EXTINGUISHED	Perform Attachment 5 while continuing with this procedure.
9.	Perform The Following: a. Inspect the area of the leak b. Report findings to the SSO c. Identify and isolate the source of the SW leak	
10.	Refer To Technical Specifications For Any Applicable LCOs	
11.	Implement The EALs	
12.	Return To Procedure And Step In Effect	

- END -

90. Which ONE (1) of the following plant conditions satisfies the requirements for both administrative controls and technical specifications of Mode 2?

A. SDB "B" @ 30 steps, Keff >0.985.

B. SDB "B" @ 30 steps, Keff >0.995.

C. SDB "A" @ 30 steps, Keff >0.985.

D. SDB "A" @ 30 steps, Keff >0.995.

91. Given the following plant conditions:

- Mode 2
- Reactor startup in progress IAW GP-003, NORMAL PLANT STARTUP FROM HOT SHUTDOWN TO CRITICAL
- The reactor is stable, Keff<1
- Stable power levels are:
  - Highest SR=22,000 cps
  - Highest IR=1.8 x 10^{-11} amps
- Rod positions are:
  - Control Bank "C" @ 202 steps
  - Control Bank "D" @ 74 steps

Using the ATTACHMENT 6.2 provided, which ONE (1) of the following provides the lowest projected criticial position?

Control Bank "D" at:

A. 92 steps (SR)

B. 114 steps (IR)

C. 220 steps (SR)

D. 218 steps (IR)

INVERSE COUNT RATE RATIO (1/M) DATA AND PLOT FORM

1. Log 1/M data as it is acquired following rod withdrawal in Table 1.
2. Plot the reference count rate (CR_o) versus Control Rod Bank and Step position on the 1/M Plot Form.
3. **WHEN** CR_1 data is available, **THEN** divide CR_o by CR_1 ($CR_0/CR_1=1/M$).
4. Plot the results versus Control Rod Bank and Step position on Attachment 6.2, 1/M Plot Form, for Source **AND** Intermediate Ranges.

> **NOTE:** Extrapolations should extend through the X-AXIS at rod positions greater than the ECP and approach the ECP as the second and third points are plotted and extrapolated.

   - Connect the new point with the previous point **AND** extend the line (extrapolate) through the X-AXIS (predicted Critical Rod Position).
   - Log the predicted Critical Rod Position on Table 1 as the LOWEST PROJECTED CRITICAL POSITION.

5. Verify that the Lowest Critical Rod Position is above the Minimum Rod Position for Criticality.
6. Calculate the target count rate for the next doubling by multiplying the current count rate by two and log the result on Table 1.
7. Repeat Steps 3 through 6 for each ECP extrapolation using CR_2 through CR_4 acquired in Section 5.2 in place of CR_1 as shown on Table 1.

INVERSE COUNT RATE RATIO (1/M) DATA AND PLOT FORM

NOTE: The Reactor Operator may shut down the Reactor if the predicted critical rod position from the 1/M plot falls outside the +/-500 pcm positions. (Project 97-00161)

Minimum Insertion Limits: 87 Steps on Bank C / _______ Steps on Bank D

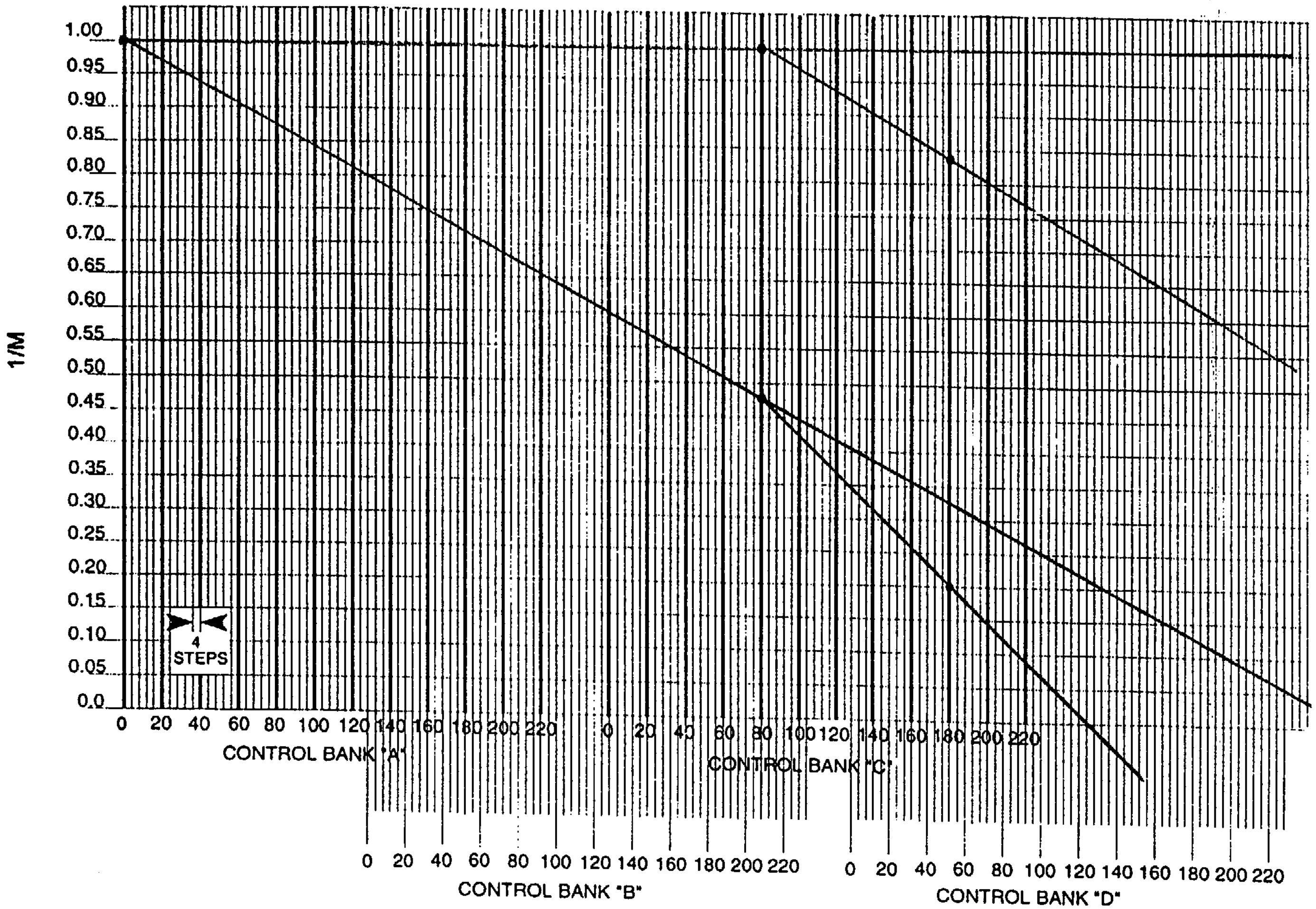
TABLE 1

STEP #	TIME	ROD POS.	NI-32 COUNTS	1/M	NI-35 AMPS	1/M	LOWEST PROJECTED CRITICAL POSITION	LOWEST PROJECTED CRIT. POS. ABOVE MIN INSERTION LIMIT (INIT)	TARGET COUNT RATE
5.2.21	0930		CR_0= 2,000	CR_0/CR_0= 1.0	CR_0= 1.0×10^{-11}	CR_0/CR_0= 1.0			$2*CR_0$= 4,000 / 2.0×10^{-11}
5.2.25	0952	80-C	CR_1= 4,200	CR_0/CR_1= 0.48	CR_1= 1.0×10^{-11}	CR_0/CR_1= 1.0	168-D	[initials]	$2*CR_1$= 8,400 / 2.0×10^{-11}
5.2.27	1005	52-D	CR_2= 10,000	CR_0/CR_2= 0.20	CR_2= 1.2×10^{-11}	CR_0/CR_2= .83	92-D	[initials]	$2*CR_2$= 20,000 / 2.4×10^{-11}
5.2.29			CR_3=	CR_0/CR_3=	CR_3=	CR_0/CR_3=			$2*CR_3$=
5.2.32			CR_4=	CR_0/CR_4=	CR_4=	CR_0/CR_4=			

DATE: _______ STARTUP #: _______ 1/M PLOTTER: ____________________

ATTACHMENT 6.2
Page 3 of 3

INVERSE COUNT RATE RATIO (1/M) DATA PLOT FORM



92. Given the following plant conditions:

- Mode 3, after a trip that occurred 5 hours ago
- Pre-startup preparations are in progress, criticality scheduled for 8 hours from now
- Reactor trip breakers are open
- An Estimated Critical Condition has been prepared for the startup
- ECC RCS boron is 670 ppm
- Mode 3 SDM is 720 ppm
- Present RCS boron concentration is 680 ppm

Which ONE (1) of the following describes the required action to take to adjust RCS boron concentration?

A. Borate to 720 ppm, then withdraw SD Bank "A"

B. Withdraw SD Bank "A", then borate to 720 ppm

C. Dilute to 670 ppm, then withdraw SD Bank "A"

D. Withdraw SD Bank "A" then dilute to 670 ppm

93. Which ONE (1) of the following describes a correct action for making a boundary change on a clearance?

A. All work activities within the scope of the clearance shall be suspended for all boundary changes.

B. Must notify clearance holders (or designated alternate if off-site) for all boundary changes.

C. Temporary Tag Lifts should be restored within the shift that they were lifted.

D. If the clearance holder is not on site, can make the changes but must notify the clearance holder as soon as practical.

94. Given the following plant conditions:

- Mode 1 at 100% RTP
- A Pressurizer PORV failure has occurred
- RCS pressure reached 2000 psig during the fault and is increasing after operator actions
- RCS temperature is Tref +2°F
- Rods are in manual

Which ONE (1) of the following describes the correct evaluation of plant conditions **and** required actions with regards to core safety limits? [SAFETY LIMITS ATTACHED]

A. Violated SL 2.1.1. Must restore compliance and be in Mode 3 within one hour.

B. Always complied with SL 2.1.1. No actions required per safety limits.

C. Violated SL 2.1.1. Must restore compliance within one hour or be in Mode 3.

D. SL 2.1.1 is not applicable during transients. No actions required per safety limit.

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

In MODES 1 and 2, the combination of THERMAL POWER, Reactor Coolant System (RCS) highest cold leg temperature, and pressurizer pressure shall not exceed the SLs specified in Figure 2.1.1-1.

2.1.2 RCS Pressure SL

In MODES 1, 2, 3, 4, and 5, the RCS pressure shall be maintained ≤ 2735 psig.

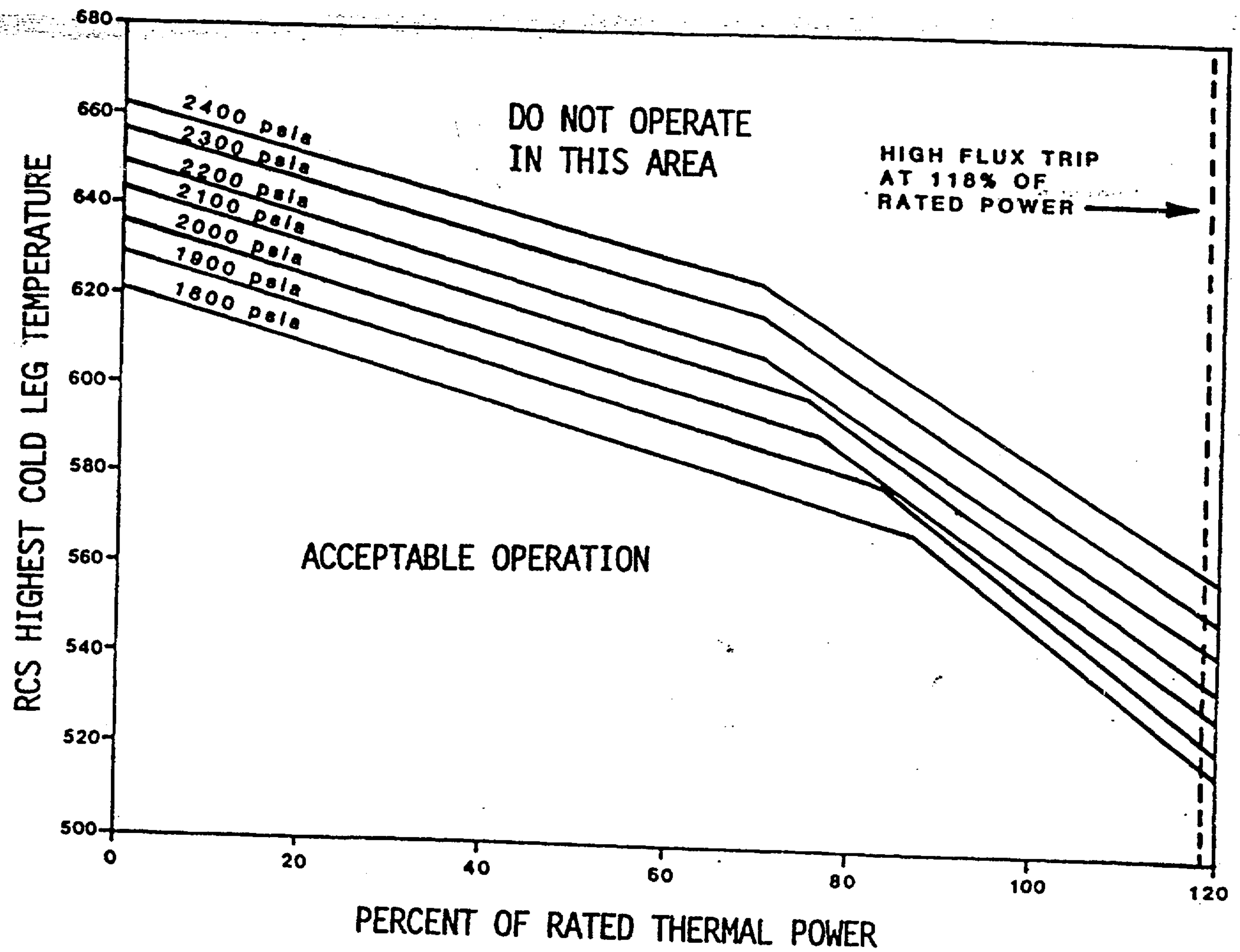
2.2 SL Violations

2.2.1 If SL 2.1.1 is violated, restore compliance and be in MODE 3 within 1 hour.

2.2.2 If SL 2.1.2 is violated:

2.2.2.1 In MODE 1 or 2, restore compliance and be in MODE 3 within 1 hour.

2.2.2.2 In MODE 3, 4, or 5, restore compliance within 5 minutes.



NOTE: BASED ON A MINIMUM RCS FLOW OF 97.3×10^6 lbm/hr

Figure 2.1.1-1 (page 1 of 1)
Reactor Core Safety Limits

95. Given the following plant conditions:

- Mode 1 at 100% RTP
- You have been directed to enter Containment to perform a task
- Your RWP states that your EPD dose alarm will be set at 80 mrem and your rate alarm will be set at 160 mrem/hr
- As you log-in using the Automated Access Control System, the computer screen warns you that RIMS is not operational

Which ONE (1) of the following describes the settings for your EPD dose and rate alarms **and** what is the appropriate response to a Dose alarm while you are performing the task?

A. Dose- 50mrem; Rate 100 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

B. Dose- 50mrem; Rate 100 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

C. Dose- 40mrem; Rate 80 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

D. Dose- 40mrem; Rate 80 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

96. Given the following plant conditions:

- Mode 6
- A CV purge is being established per OP-921, CONTAINMENT AIR HANDLING
- The Containment Personnel Airlock Doors will not remain open throughout the purge

Which ONE (1) of the following describes the effect this will have on the Auxiliary Building?

The Auxiliary building will:

A. pressurize unless HVS-1, Auxiliary Building Supply Fan, is running.

B. pressurize unless HVS-1, Auxiliary Building Supply Fan, is secured.

C. depressurize unless HVS-1, Auxiliary Building Supply Fan, is running.

D. depressurize unless HVS-1, Auxiliary Building Supply Fan, is secured.

97. Given the following plant conditions:

- Mode 5
- RCS pressure is 330 psig
- Chemistry has just added H_2O_2 (Hydrogen Peroxide) to the RCS

Which ONE (1) of the following describes an effect this chemical addition will have on the plant?

A. Radiaton levels will initially decrease in the letdown line.

B. The H_2O_2 will convert to water because RCS temperature is >200 degrees.

C. Cummulative exposure during the refueling will be reduced.

D. A sufficient hydrogen inventory will exist to scavenge oxygen.

98. Which ONE (1) of the following contains indications that all lead to entry into FRP-C.1, RESPONSE TO INADEQUATE CORE COOLING?

A. 2 RCP's running, CET's 705°F, RVLIS dynamic head 36%.

B. 1 RCP running, CET's 1135°F, RVLIS dynamic head 20%.

C. CET's 585°F, RVLIS full range 31%.

D. CET's 705°F, RVLIS full range 36%.

99. During EPP-6, NATURAL CIRCULATION COOLDOWN WITH A STEAM VOID IN THE VESSEL, you are directed to establish Pressurizer level between 20-25%. Which ONE (1) of the following states the correct reason for establishing this Pressurizer level?

This level is established prior to cooldown in order to:

A. provide additional static head to enhance natural circulation.

B. ensure letdown flow is not disrupted.

C. ensure the accommodation of void growth.

D. provide a method to monitor void growth.

100. Given the following plant conditions:

- The Unit is in FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
- All immediate actions have been performed
- Emergency boration is in progress
- AFW is in operation, all S/G's are 8% (NR)
- RCS pressure is 2300 psig

Which ONE (1) of the following desribes the feed flow requirement **and** the basis for it?

A. AFW flow at least 300 gpm to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

B. AFW flow at least 600 gpm to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

C. FW bypass flow >0.2 x 10^6 pph to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

D. FW bypass flow >0.4 x 10^6 pph to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

Wednesday, July 14, 1999 @ 08:43 AM

Answer Key

Page: 1

Test Name: 981NRCRO.TST
Test Date: Thursday, June 10, 1999

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	1	RODCNTRL	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	2	RCP	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	3	EPP-005	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	4	EPP-006	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	5	AOP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	6	EPP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	EPP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	8	OMM	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	9	EPP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	10	AFW	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	11	AOP-024	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	12	AOP-024	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	13	AOP-004	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	14	CV INTEGRITY	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	15	CV	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	16	AOP-005	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	17	SD-032	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	18	AOP-001	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	19	AOP-016	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	20	AOP-014	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	21	EPP-024	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	22	EPP-009	004	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	23	EPP-007	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	24	AOP	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	25	FRP-S.1	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	26	NI	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	27	NI	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	28	PATH-2	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	29	AOP-010	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	30	FRP-H.1	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	31	AOP	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	32	AOP-009	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	33	RMS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	34	AOP-025	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	35	EPP-001	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	36	FRP-H.2	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	37	AOP-001	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	38	TS-3.2.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	39	AOP-014	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	SD-021	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
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1:	42	SD-006	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	43	SD-002	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	44	SD-010	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
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1:	46	SD-010	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	47	SD-015	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	48	SD-006	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	49	FRP-H.5	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	50	MFW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A

Test Name: 981NRCRO.TST
Test Date: Thursday, June 10, 1999

Question ID				Type	Pts	0	1	2	3	4	5	6	7	8	9
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1:	52	SD-038	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	53	WD	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	54	RMS	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	55	SD	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	56	SD	018	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	57	AOP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
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1:	63	SD	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
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1:	71	ITS	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	72	AOP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	73	SD	014	MC-SR	1	B ~~A~~ amE	B	C	D	A	B	C	D	A	B
1:	74	SD	015	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	75	SD	016	MC-SR	1	D	A	B	C	D	A	B	C	D	A
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1:	77	EDG	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	78	SD	017	MC-SR	1	C	D	A	B	C	D	A	B	C	D
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1:	91	GP	003	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	92	GP	002	MC-SR	1	A ~~B~~ amE	C	D	A	B	C	D	A	B	C
1:	93	PROC	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
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1:	95	10CFR20	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	96	OP	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	97	GP	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	98	FRP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	99	EPP	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	100	FRP	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A

MASTER 99-301
ROBINSON

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information

Name:	Region: II
Date:	Facility/Unit: H. B. Robinson Unit 2
License Level: SRO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

____
Applicant's Signature

Results

Examination Value	________	Points
Applicant's Score	________	Points
Applicant's Grade	________	Percent

1. Given the following plant conditions:

- Mode 2
- A reactor startup is in progress IAW GP-003, NORMAL PLANT STARTUP FROM HOT SHUTDOWN TO CRITICAL
- Reactor is critical, power levels are:
    - N31- 62,000 cps
    - N32- 56,000 cps
    - N35- $9x10^{-11}$ amps
    - N36- $1x10^{-10}$ amps
- The RO withdraws rods 2 steps to get N35 to $1x10^{-10}$ amps
- When the RO releases the Rod Control switch, the rods continue to step out
- Power levels are now:
    - N31- 100,000 cps
    - N32- 92,000 cps
    - N35- $1.1x10^{-10}$ amps
    - N36- $1.2x10^{-10}$ amps

Which ONE (1) of the following describes the correct action(s) to take?

A. Manually trip the reactor.

B. Go to IN on the Rod Control switch in an attempt to stop rod motion.

C. Select AUTO on the Rod Bank Selector switch in an attempt to stop rod motion.

D. Verify both P-6 lights illuminated and depress both SR High Trip block buttons.

2. Given the following conditions:

- Mode 1 at 100% RTP
- A rod dropped to the bottom of the core
- It is time 07:00 on the attached graphs

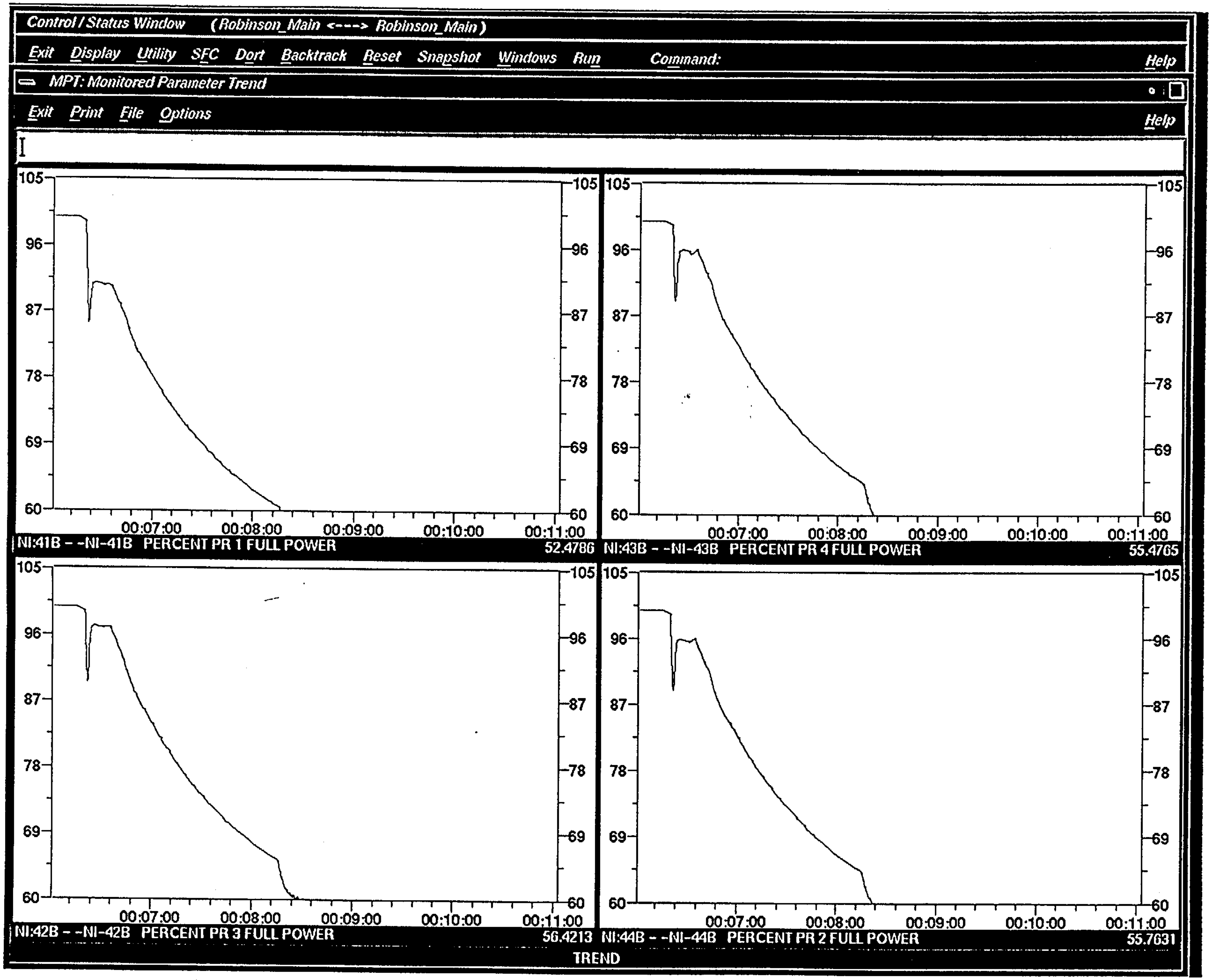
Using the attached data, which ONE (1) of the following describes the core location for the dropped rod **and** the effect on the plant?

A. E11; there is a demand for rod withdrawal.

B. E11; there is a demand for rod insertion.

C. L05; there is a demand for rod withdrawal.

D. L05; there is a demand for rod insertion.


Control / Status Window (Robinson_Main <---> Robinson_Main)
Exit Display Utility SFC Dort Backtrack Reset Snapshot Windows Run Command: Help
MPT: Monitored Parameter Trend
Exit Print File Options Help
NI:41B - -NI-41B PERCENT PR 1 FULL POWER 52.4786
NI:43B - -NI-43B PERCENT PR 4 FULL POWER 55.4765
NI:42B - -NI-42B PERCENT PR 3 FULL POWER 56.4213
NI:44B - -NI-44B PERCENT PR 2 FULL POWER 55.7631
105 96 87 78 69 60
00:07:00 00:08:00 00:09:00 00:10:00 00:11:00
TREND

ATTACHMENT 9.1
Page 1 of 1

RCC CORE LOCATION GUIDE

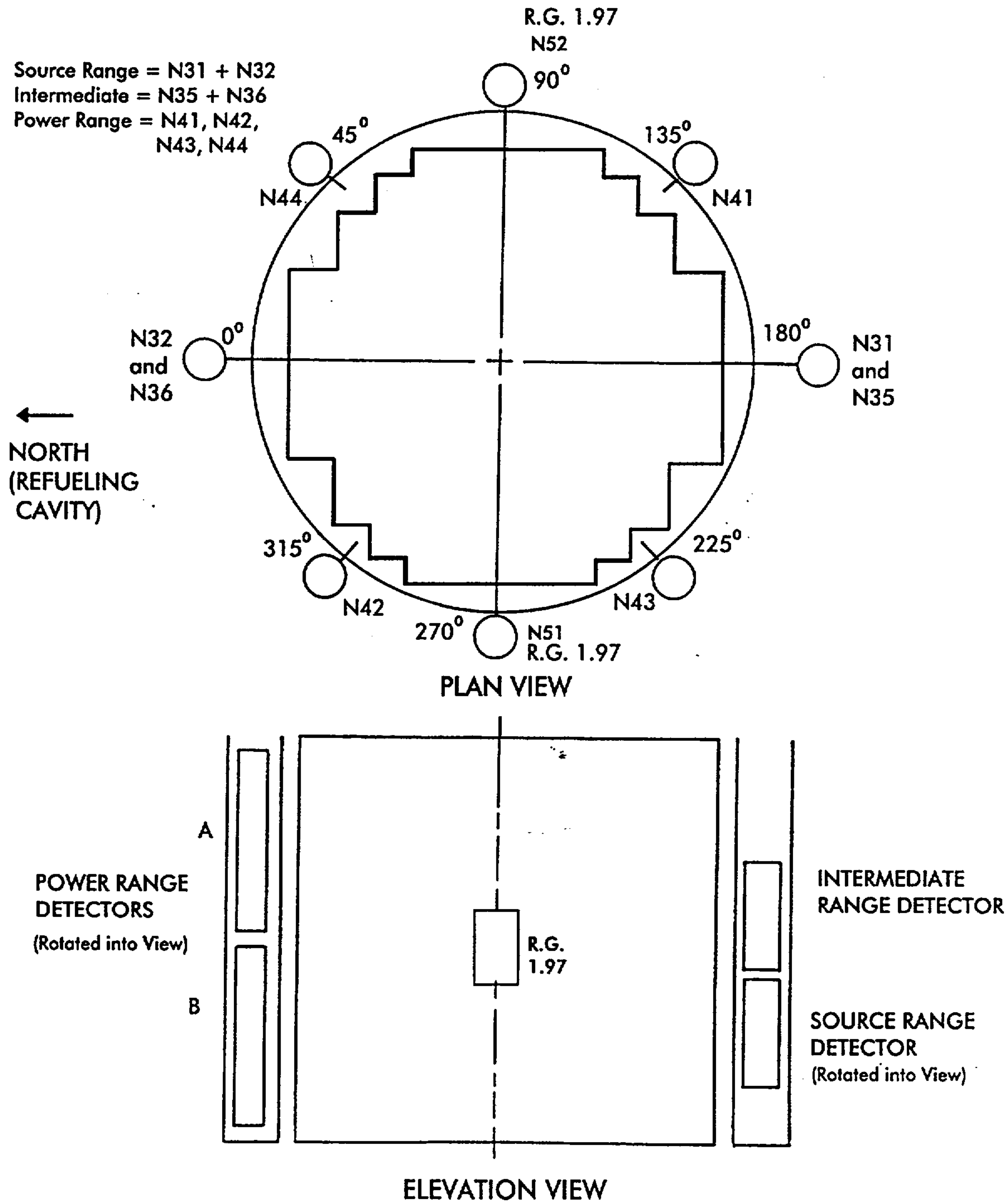
↑
N

	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A
1															
2						*				*					
3							*		*						
4						*		*		*					
5					*		*		*		*				
6		*		*				*				*		*	
7			*		*						*		*		
8				*		*		*		*		*			
9			*		*						*		*		
10		*		*				*				*		*	
11					*		*		*		*				
12						*		*		*					
13							*		*						
14						*				*					
15															

* = RCC

LOCATION OF DETECTORS

NI-FIGURE-1 (Rev . 0)



3. Given the following plant conditions:

- Control Rod H-8 from Control Bank "D" (CBD) has dropped into the core
- A runback has occurred and the operators have stabilized the plant at 67% RTP
- CBD @188 steps
- The operators are preparing to recover rod H-8

Which ONE (1) of the following describes the operability of Control Rod H-8 at this time?

The rod is considered:

A. operable because it can be moved by it's mechanism.

B. operable because it is providing the assumed reactivity that would be available upon a reactor trip.

C. inoperable because it is not trippable.

D. inoperable because it is more than 7.5 inches out of alignment with it's bank.

4. Given the following plant conditions:

- The plant has experienced a LBLOCA
- The crew is implementing Path 1
- Safeguards systems are operating as designed
- RCS Pressure is 22 psig
- The STA has reset SPDS and begun monitoring CSFST's
- There is a valid ORANGE path for RCS Integrity

Which ONE (1) of the following describes the correct crew response to these conditions?

A. Remain in Path-1, transition to FRP-P.1, RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK, is not required unless RCS Integrity turns RED.

B. Remain in Path-1, transition to FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, is not reuired, even if RCS Integrity turns RED.

C. Transition to FRP-P.2, RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK, and complete the steps up to checking the status of RHR flow and RCS pressure, then reset SPDS and return to Path 1.

D. Transition to FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, and complete the steps up to checking the status of RHR flow and RCS pressure, then reset SPDS and return to Path 1.

5. Given the following plant conditions:

- Shutdown following a reactor trip and safety injection due to a failed S/G Safety valve
- The crew has transitioned to EPP-7, SI TERMINATION, from Path 1
- The following have been reset:
  - SI
  - Containment Isolation Phase A and Phase B
  - Feedwater Isolation
- Charging flow is 40 gpm
- All SI and RHR pumps have been stopped
- RCS subcooling is 52°F
- Pressurizer level is 10% and rapidly decreasing due to overfeeding S/G's

Which ONE (1) of the following describes the correct actions to be taken by the crew for these conditions?

A. Increase charging flow to increase Pressurizer level and continue in EPP-7.

B. Secure feeding S/G's until Pressurizer level recovers and continue in EPP-7.

C. Start both SI pumps and go to Path 1, Entry Point "C".

D. Manually initiate SI and go to Path 1, Entry Point "A".

6. Given the following plant conditions:

- Mode 1 at 30% RTP
- The following annunciators are illuminated
  - APP-001-D2, RCP#1 SEAL LEAKOFF HI FLOW
  - APP-001-B2, RCP LABYRINTH SEAL LO DP
- The RO reports that shaft vibrations and seal leakoff flows are as follows:
  - "A" = 11 mils; 1.2 gpm and steady
  - "B" = 11 mils; 1.3 gpm and steady
  - "C" = 14 mils; 5.0 gpm and increasing 0.1 gpm every 10 minutes
- You enter AOP-018, RCP MALFUNCTIONS
- The STA reports that "C" RCP #1 Seal temperature is 198°F and very slowly increasing
- The Inside AO reports all Seal Injection flows appear to be normal

Which ONE (1) of the following describes the correct crew response to these conditions?

A. IAW AOP-018, trip the reactor, trip "C" RCP, go to Path 1, and continue with AOP-018.

B. Trip "C" RCP, commence plant shutdown IAW GP-006, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN, continue with AOP-018.

C. Notify Engineering of RCP Seal conditions and instruct them to contact Westinghouse for further instructions. If RCP "C" parameters deteriorate to RCP trip criteria, trip the reactor, trip "C" RCP, go to Path 1, and continue with AOP-018.

D. Notify Engineering of RCP Seal conditions and instruct them to contact Westinghouse for further instructions. If RCP "C" Seal Leakoff goes offscale high, then trip the reactor, trip "C" RCP, go to Path 1, and continue with AOP-018.

7. Given the following plant conditions:

- Crew has transitioned from GP-004, POST TRIP STABILIZATION, to EPP-5, NATURAL CIRCULATION COOLDOWN
- Operator has energized 150kw of PZR heaters

Which ONE (1) of the following describes the reason for energizing PZR heaters?

A. Minimize head voiding during the cooldown.

B. Minimize the potential of inadvertent dilution when borating.

C. Increase subcooling so cooldown rate can be increased to 25°F per hour.

D. Increase subcooling so cooldown rate can be increased to 100°F per hour.

8. Given the following plant conditions:

- Crew is performing EPP-6, NATURAL CIRCULATION COOLDOWN WITH A VOID IN THE VESSEL
- The Reactor Operator has been directed to control PZR level >20% and < 90%

Which ONE (1) of the following correctly describes the plant response if letdown is greater than charging?

A. PZR pressure will decrease. This will cause PZR level to decrease.

B. PZR pressure will decrease. This will cause PZR level to increase.

C. PZR pressure will increase. This will cause PZR level to increase.

D. PZR pressure will increase. This will cause PZR level to decrease.

9. Given the following conditions:

- Core Burnup = 16,800 MWd/MTU
- MODE 3, normal operating pressure and temperature
- RCS C_B = 320 ppm
- GP-007, Plant Cooldown from Hot Shutdown To Cold Shutdown is in progress in preparation for a refueling outage

Using the exerpts from the Station Curve Book (PROVIDED), which ONE (1) of the following provides the approximate amount of Boric Acid required to allow RCS cooldown to 150°F while maintaining 4% Shutdown Margin.

A. 648 gal

B. 968 gal

C. 1000 gal

D. 1500 gal

Table 1.11
H. B. ROBINSON UNIT 2 CYCLE 19
Boron Concentration Required to Maintain
A Minimum of 1.77% Shutdown Margin (PPM)
(ARI-SA-MRR)

Burnup (MWd/MTU)

Temp (F)	16800	16848
38	841	838
40	840	837
50	836	833
60	832	829
70	828	825
80	824	821
100	816	813
120	808	805
140	800	797
160	792	789
180	784	781
200	776	773
220	762	758
240	747	744
260	733	729
280	718	715
300	704	700
320	689	686
340	675	671
350	668	664
360	650	646
380	614	610
400	578	574
420	542	538
440	506	502
460	470	466
480	434	430
500	398	394
520	362	358
540	326	322
547	313	309

Table 1.14
H. B. ROBINSON UNIT 2 CYCLE 19
Boron Concentration Required to Maintain
A Minimum of 4.00% Shutdown Margin (PPM)
(ARI-SA-MRR)

Burnup (MWd/MTU)

Temp (F)	16800	16848
38	1007	1004
40	1007	1003
50	1003	1000
60	1000	996
70	996	993
80	992	989
100	985	982
120	978	975
140	971	967
160	964	960
180	957	953
200	950	946
220	937	933
240	924	921
260	912	908
280	899	895
300	886	883
320	874	870
340	861	857
350	855	851
360	838	835
380	806	802
400	773	769
420	741	737
440	708	704
460	675	671
480	643	639
500	610	606
520	577	573
540	545	540
547	533	529

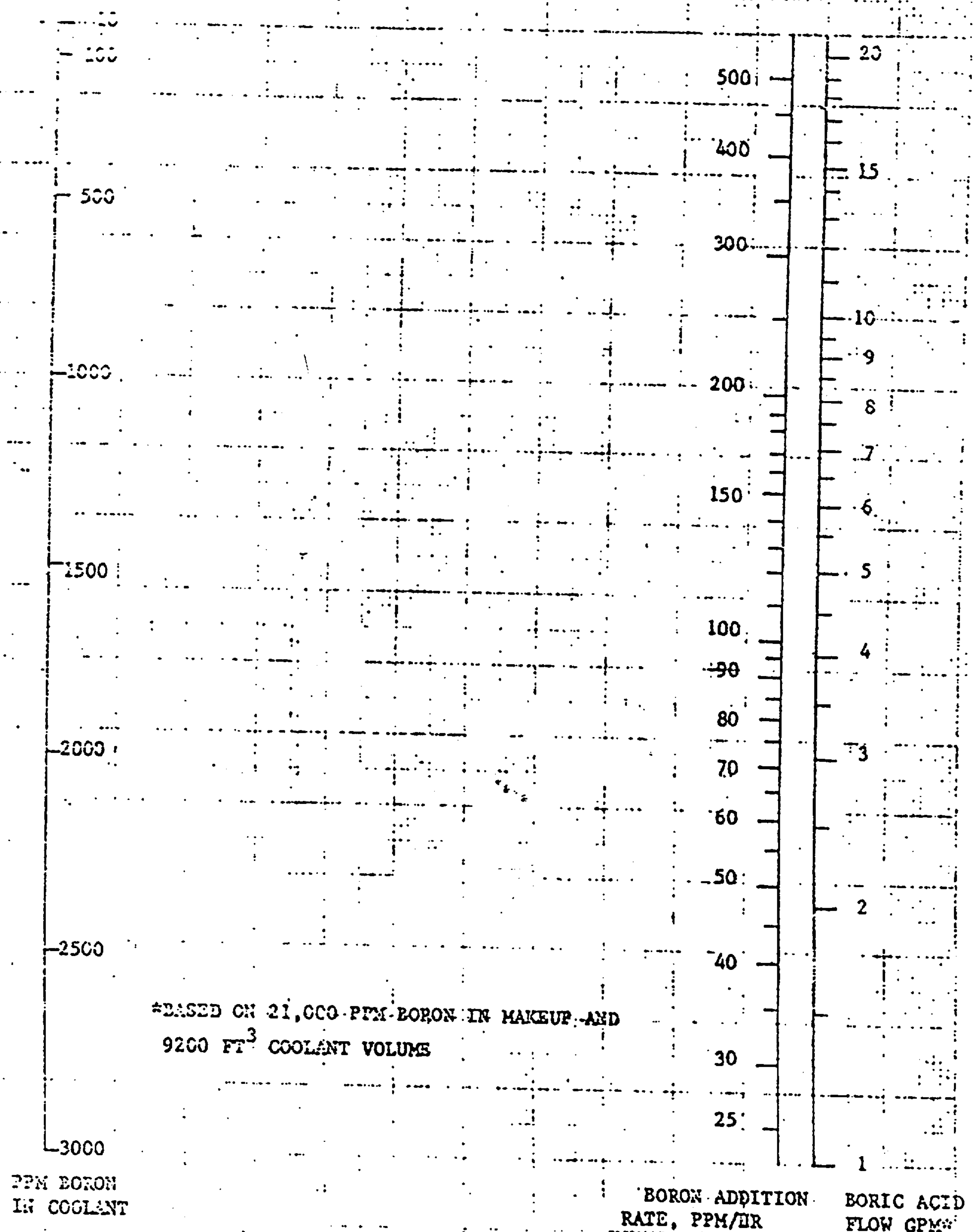


FIGURE S-3.1-1 BORON ADDITION RATE - COOLANT HOT (~580°F)

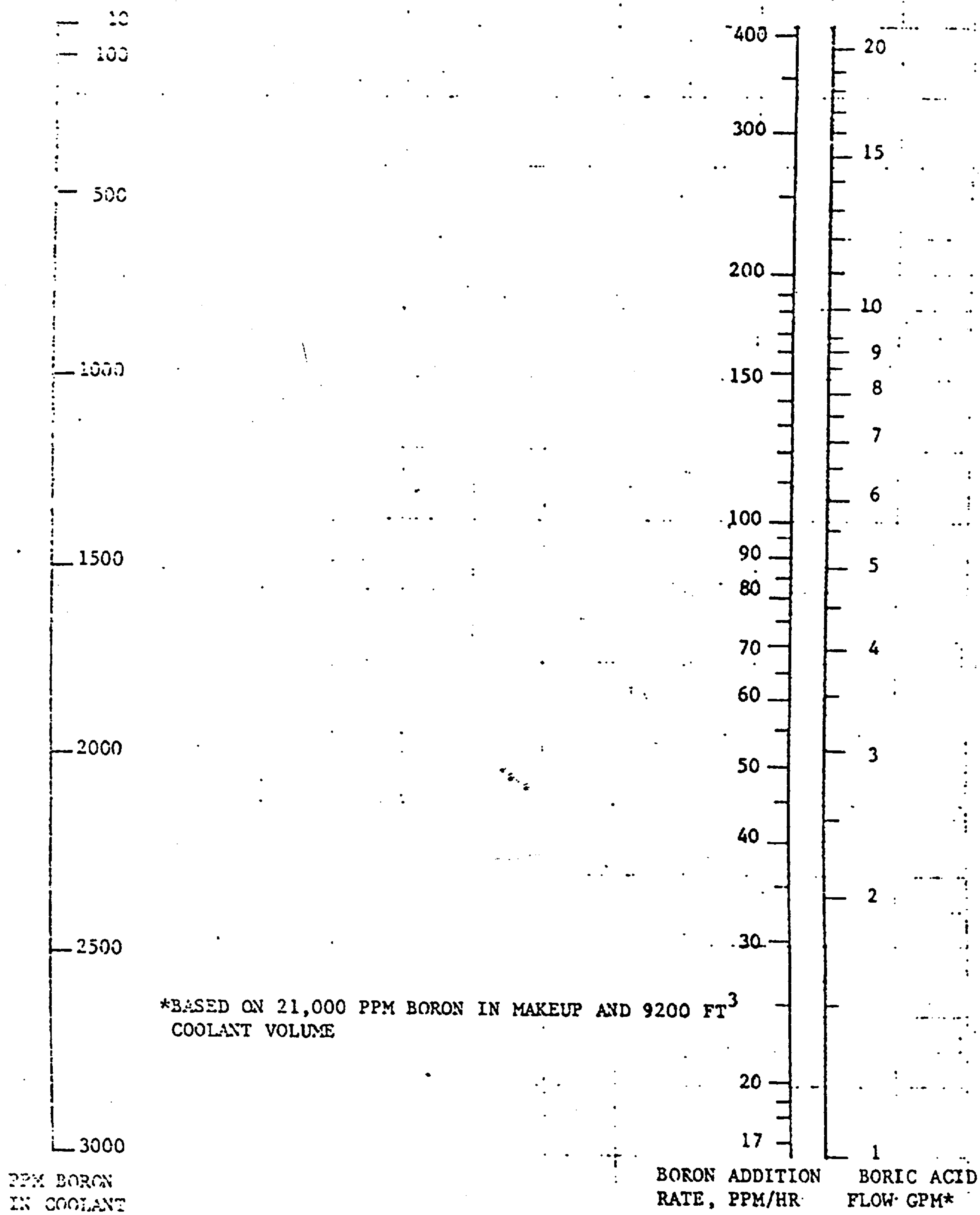


FIGURE S-3.1-2 BORON ADDITION RATE - COOLANT COLD (-100°F)

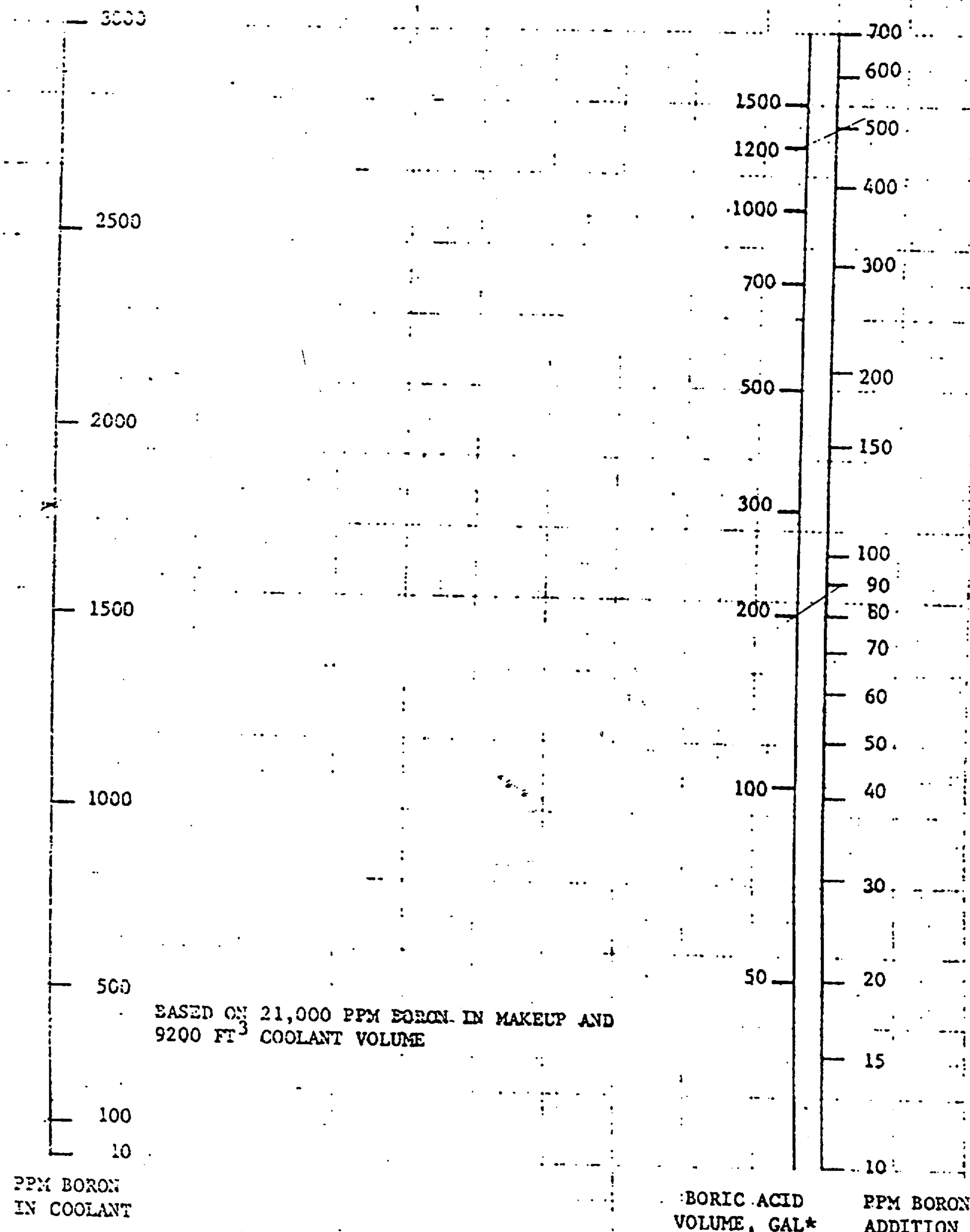


FIGURE S-3.1-3 BORON ADDITION - COOLANT HOT (~580°F)

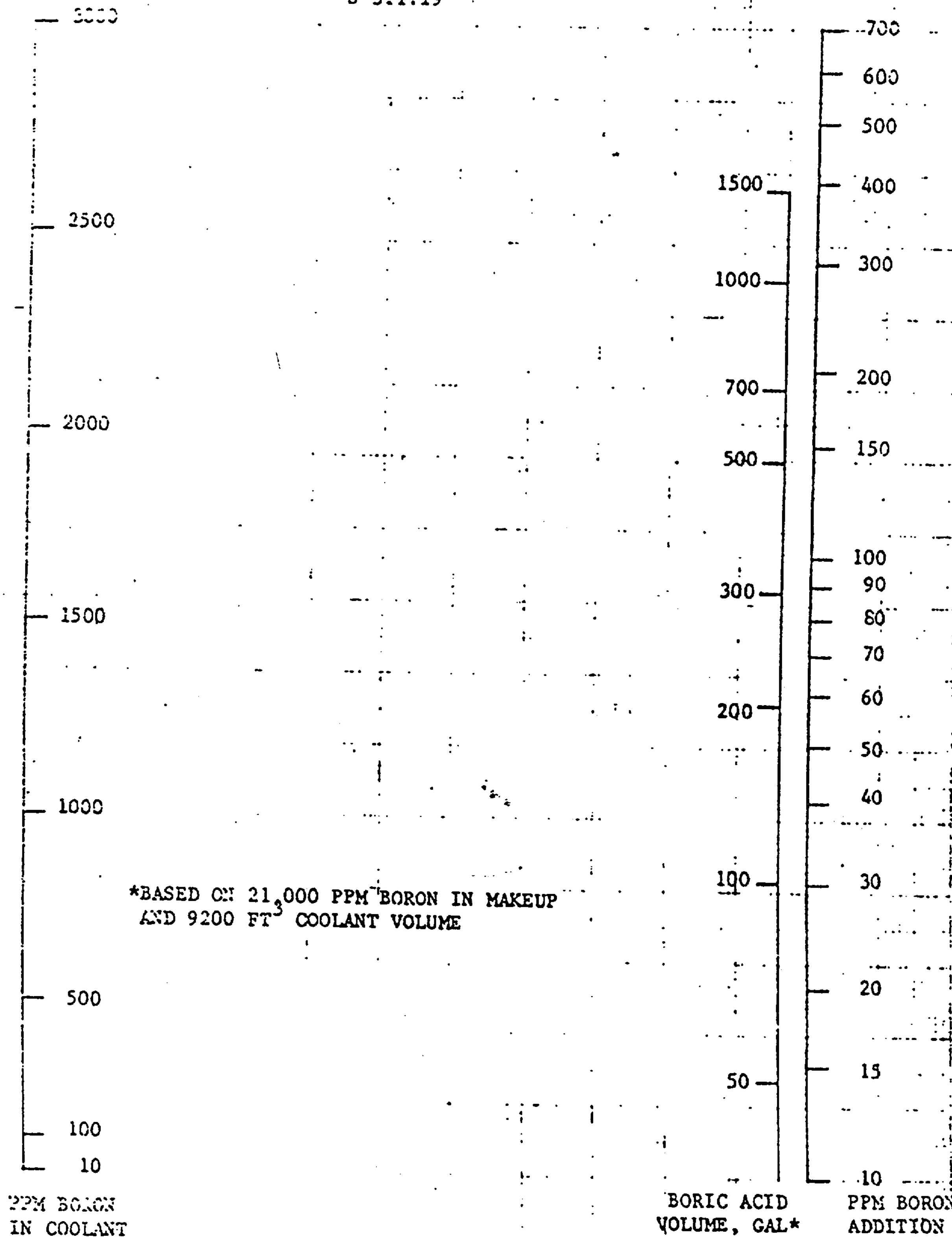


FIGURE S-3.1-4 BORON ADDITION - COOLANT COLD (-100°F)

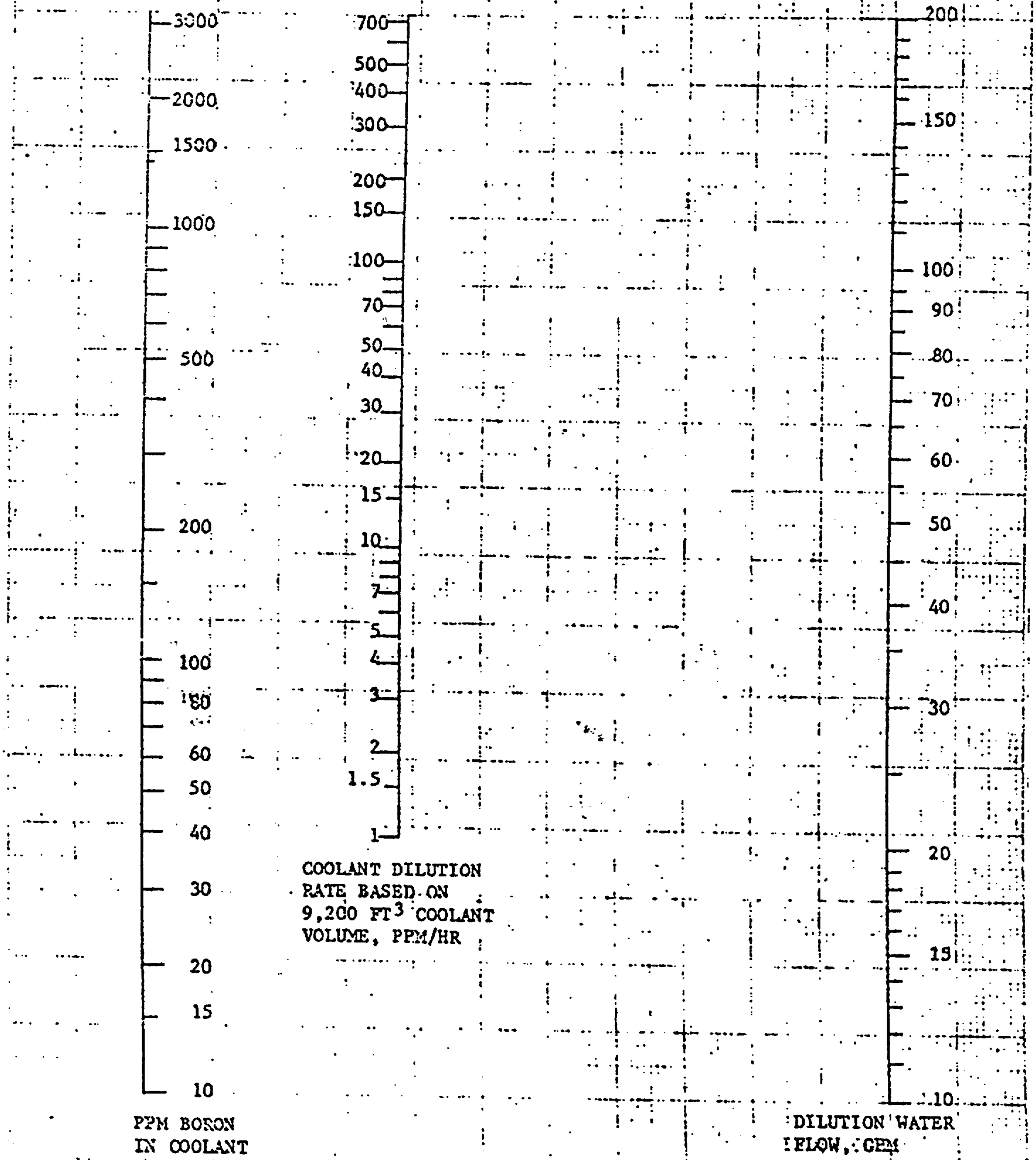


FIGURE S-3.1-5 DILUTION RATE - COOLANT HOT (~580°F)

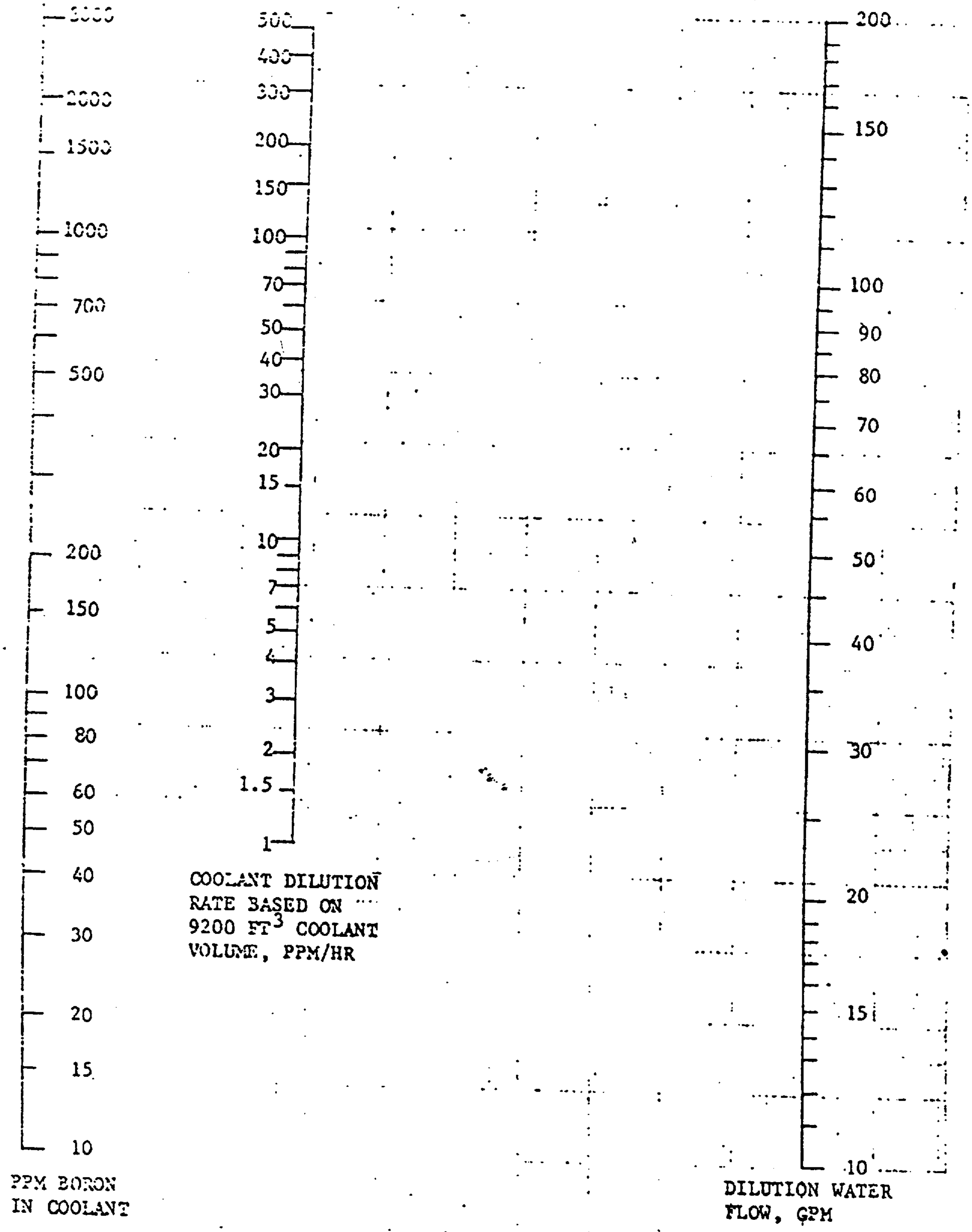


FIGURE S-3.1-6 DILUTION RATE - COOLANT COLD (~100°F)

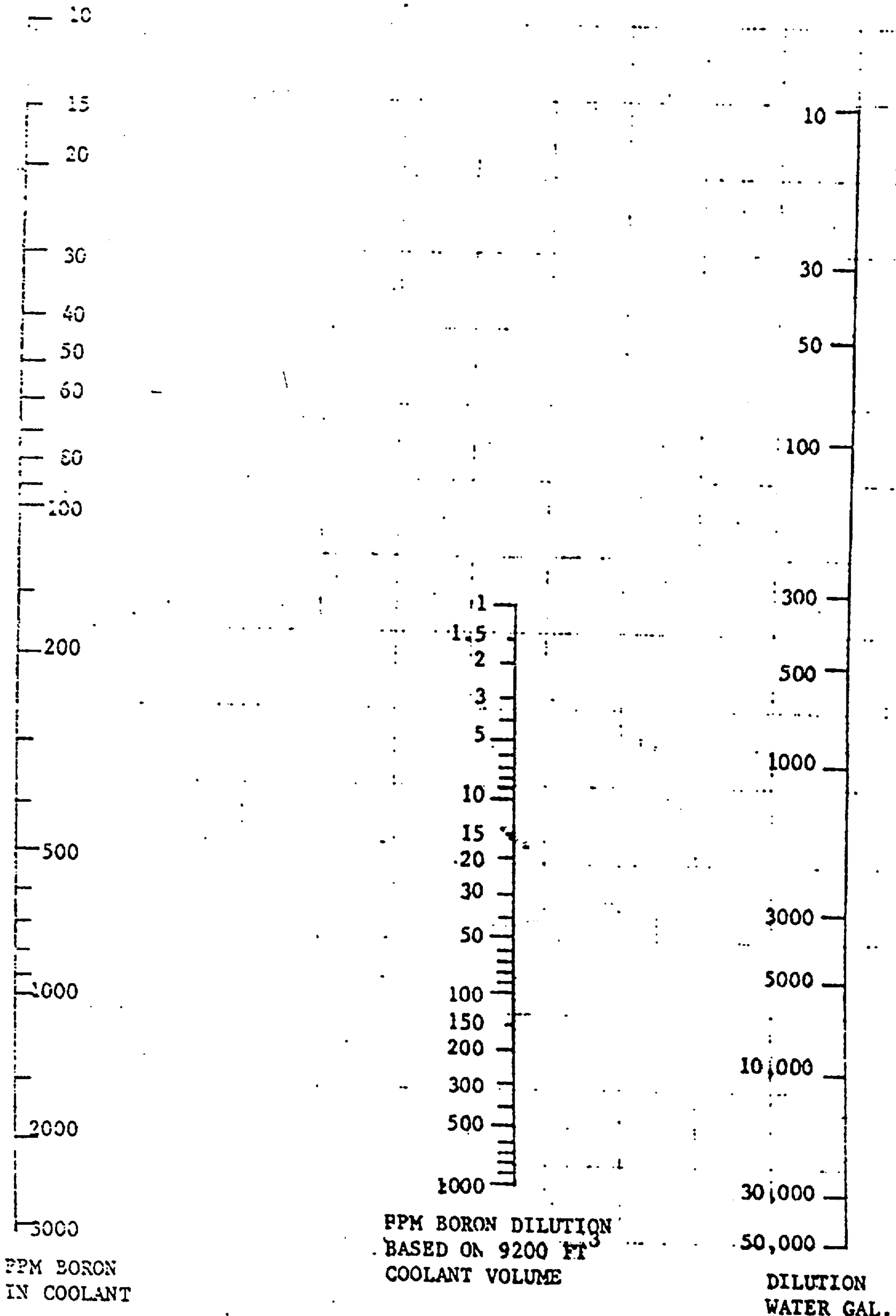


FIGURE S-3.1-7 DILUTION NOMOGRAPH - COOLANT HOT (~580°F)

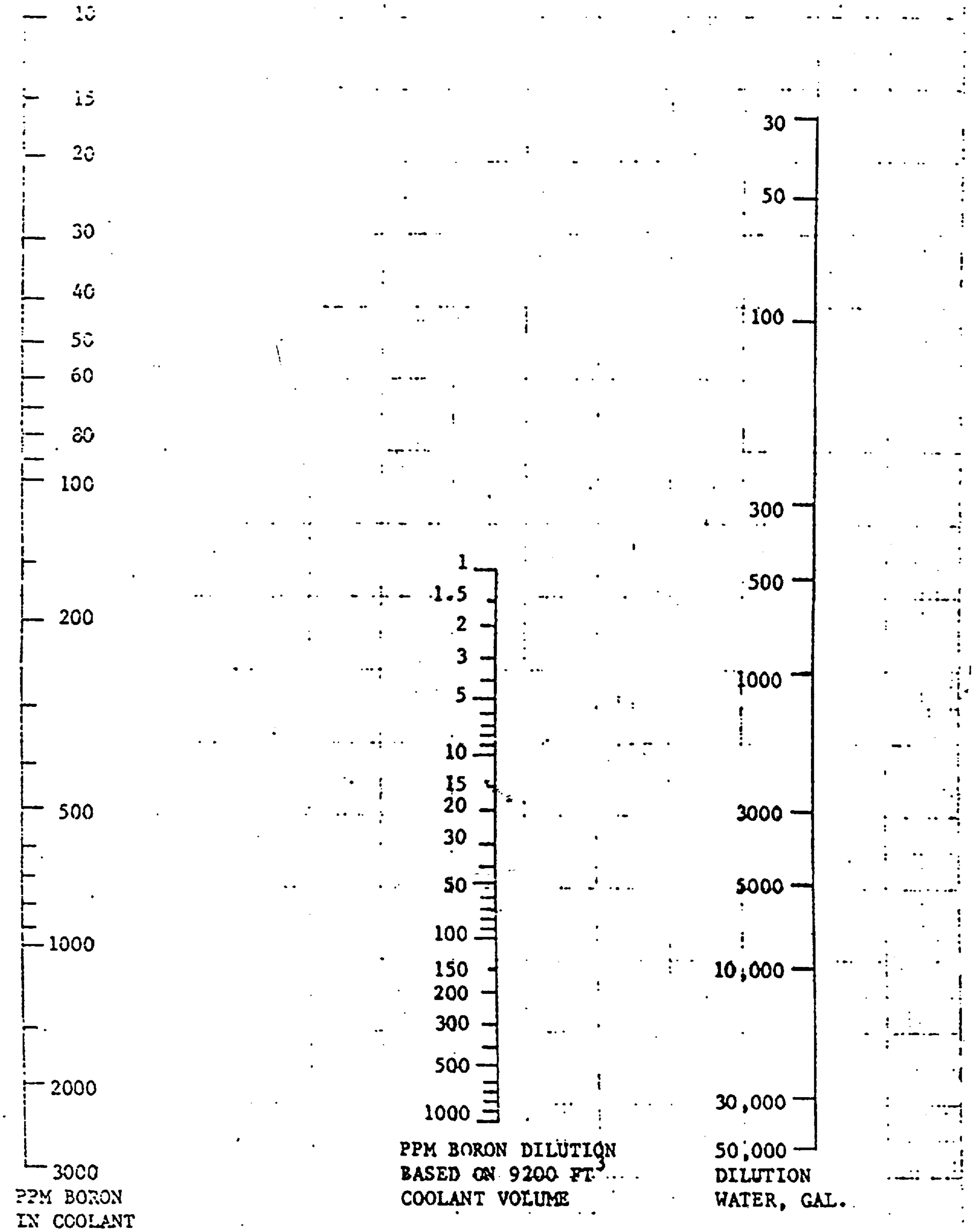


FIGURE S-3.1-8 DILUTION NOMOGRAPH - COOLANT COLD (~100°F)

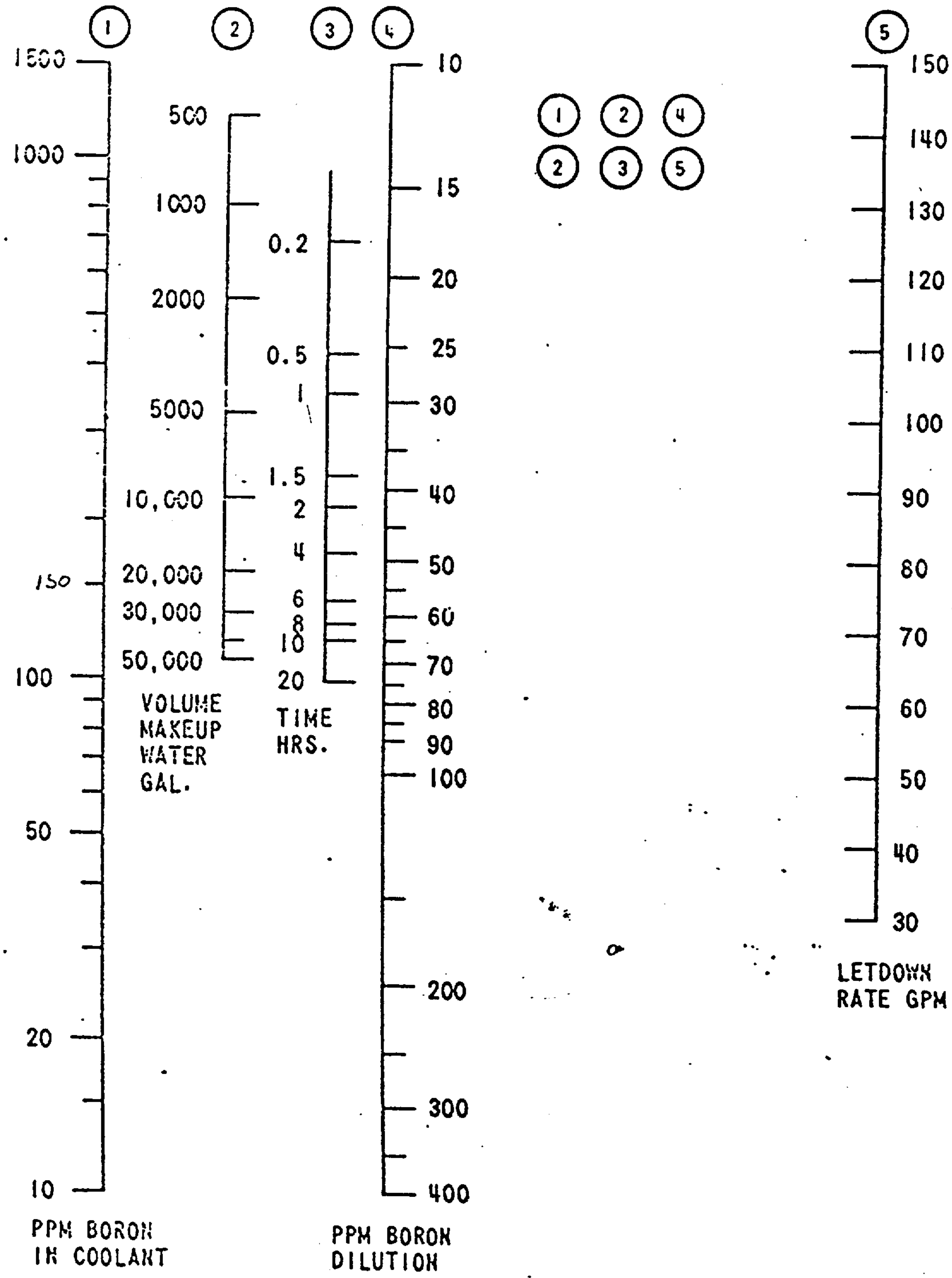


Figure S-3.1-9. Dilution and Letdown Rate Nomograph Coolant Hot (580°F)

23

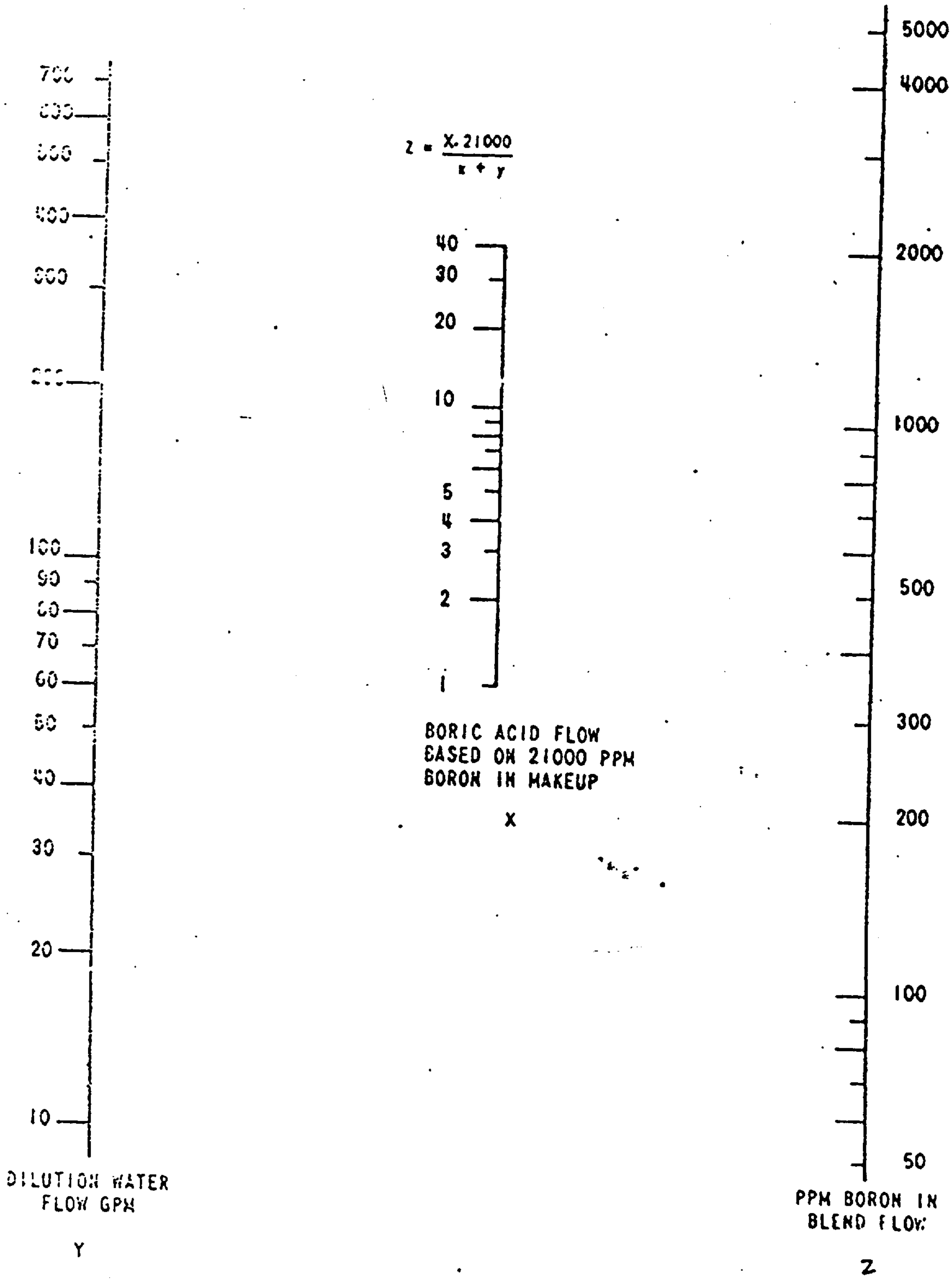


Figure 10. Blended Flow Nomograph

10. Given the following plant conditions:

- You are in FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
- You have progressed through the procedure with success except you are unable to borate
- Toward the end of the procedure you are directed to "Check Reactor Subcritical"
- Intermediate range SUR indications do not support a subcritical condition
- The RNO directs you to:
  - Allow the RCS to heat up
  - Perform actions of other FRP's as required by CSFST's
- SPDS shows:
  - RED on Subcriticality
  - ORANGE on Core Cooling
  - RED on Heat Sink
  - YELLOW on RCS Integrity
  - ORANGE on Containment
  - YELLOW on RCS Inventory

Which ONE (1) of the following states the highest priority FRP action allowable based on these plant conditions?

A. Soak the RCS in FRP-P.2.

B. Establish Injection flow in FRP-C.2.

C. Restore AFW flow in FRP-H.1.

D. Establish Containment Spray in FRP-J.1.

11. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS Subcooling is +165°F
- RCS Pressure is 1720 psig and decreasing
- S/G "A" level is 4% (NR), pressure is 300 psig
- S/G "B" level is 8% (NR), pressure is 320 psig
- S/G "C" level is 0% (NR), 45% (WR), pressure is 150 psig
- CV pressure is 16 psig
- All automatic features have actuated properly

Which ONE (1) of the following contains a correct diagnosis **and** action based on the above indications?

A. Feed header rupture outside of containment, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

B. Only "C" S/G faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

C. All S/G's faulted, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

D. All S/G's faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

12. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS pressure is 1950 psig
- Pressurizer level is 23%
- RCS temperature is 486°F
- RV1-1, Steam Line PORV for S/G "A" is partially OPEN and cannot be shut
- S/G "A" level is 25% WR, pressure is 400 psig and both are decreasing
- S/G "B" and "C" levels are 22% NR and stable

Which ONE (1) of the following contains the expected pressure in S/G's "B" and "C" based on the above indications?

A. 400 psig

B. 585 psig

C. 600 psig

D. 615 psig

13. Given the following plant conditions:

- The Unit is shutdown following a reactor trip
- The path directs you to EPP-11, FAULTED STEAM GENERATOR ISOLATION
- You discover that your copy of EPP-11 is missing
- Upon investigation, all of the copies of EPP-11 in the Control Room are all missing

Which ONE (1) of the following describes the correct process for verifying the current revision of EPP-11?

A. Refer to the "Ref Only" file in the POM directory on the LAN.

B. Refer to the the revision status on NRCS.

C. Reference the copy in the simulator for the correct revision number.

D. Contact document services to verify the current revision.

14. Given the following plant conditions:

- The plant has experienced a SBLOCA
- RCP's have been stopped IAW FOLDOUT "A" criteria
- Containment pressure is 8 psig
- The crew is in FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, due to a CSFST RED path
- SI cannot be terminated because of the present subcooling condition

Which ONE (1) of the following states the minimum subcooling required to re-start an RCP **and** what is the basis for starting an RCP in the above condition?

A. 35°F; provides core cooling.

B. 55°F; provides core cooling.

C. 35°F; provides mixing of warm RCS and cold SI water.

D. 55°F; provides mixing of warm RCS and cold SI water.

15. Given the following plant condition:

- Station Battery "A" has a capacity of 1070 amp-hours
- Station Battery "B" has a capacity of 340 amp-hours
- Each is sized to be able to carry expected shutdown loads during a design basis accident for a specified period of time without a battery charrger

Which ONE (1) of the following states the specified period of time for discharge **and** which battery has the higher discharge rate.

A. Both one hour; A has the highest discharge rate.

B. Both one hour, B has the highest discharge rate.

C. B one hour, A three hours, A has the highest discharge rate.

D. A one hour, B three hours, B has the highest discharge rate.

16. Which ONE (1) of the following describes the basis for the length of time for which Station Battery capacity is designed?

A. Need 1 train to shutdown the reactor and maintain it in a safe condition for 1 hour after a DBA.

B. Need 2 trains to shutdown the reactor and maintain it in a safe condition for 1 hour after a DBA.

C. Need 1 train to shutdown the reactor and maintain it in a safe condition for 2 hours after a DBA.

D. Need 2 trains to shutdown the reactor and maintain it in a safe condition for 2 hours after a DBA.

17. Given the following plant conditions:

- The Unit has experienced a Station Blackout
- The crew is implementing EPP-1, LOSS OF ALL AC POWER
- The Secondary Control Panel Operator has been directed to dump steam from all intact S/G's at the maximum rate to 240 psig

Which ONE (1) of the following describes the correct crew response for a return to criticality **and** at what time in core life would a return to criticality be more likely?

A. Verify that SI accumulators have been injected into the RCS. BOL.

B. Verify that SI accumulators have been injected into the RCS. EOL.

C. Reduce rate of dumping steam and allow RCS to heatup. BOL.

D. Reduce rate of dumping steam and allow RCS to heatup. EOL.

18. Given the following plant conditions:

- Mode 1 at 100% RTP
- A turbine runback occurs
- All windows on Bistable Status Panel "A" are extinguished

Which ONE (1) of the following would provide the above indications if all systems functioned as designed?

A. Loss of "B" battery

B. Loss of "A" battery

C. Loss of Instrument Bus 3

D. Loss of Instrument Bus 1

19. Which ONE (1) of the following provides a plant condition that exceeds the limitation for TI-607, CCW Supply Header Temperature, if RCS temperature is <350°F?

    A. 122°F with normal letdown in service.

    B. 103°F with PASS in service.

    C. 118°F with RHR Pump "A" running.

    D. 111°F with excess letdown in service.

20. Given the following conditions:

- Mode 1 at 100% RTP
- The CVCS Holdup Tank Room is a Locked High Radiation Area due to a 15 R/hr hotspot on the east side of the "A" Hold-Up Tank
- The on-shift Radiation Control technician is in Containment supporting an entry
- A fire is reported in the CVCS Hold-Up Tank Room

Which ONE (1) of the following describes a condition which will allow fire brigade entry into the CVCS Holdup Tank Room?

A. Entry can only be made if all fire brigade members have an emergency dosimeter and a survey instrument.

B. Entry can be made if at least one fire brigade member has an emergency dosimeter and a survey instrument.

C. Entry can be made if at least one licensed operator with a survey meter accompanies the fire brigade.

D. Entry can only be made if a Radiation Control technician, qualified as a fire brigade member, accompanies the fire brigade.

21. Given the following plant conditions:

- Mode 5 due to a forced outage
- Plant heat-up and Mode 4 entry is scheduled for 12 hours from now
- Several CV entries have been made which required both air lock doors to be opened at the same time

Which ONE (1) of the following describes the surveillance requirements that must be satisfied for CV Integrity?

OST-014, LLRT (Local Leak Rate Test) OF PERSONNEL AIR LOCK DOOR SEALS, shall be performed:

A. within 3 days of the initial entrance to the CV.

B. within 3 days of the final entrance to the CV.

C. prior to RCS temperature exceeding 200°F.

D. upon RCS temperature reaching 200°F.

22. Given the following plant conditions:

- RCS temperature is 225°F with a plant heatup in progress
- At 1200, while exiting Containment (CV), a group of personnel were unable to close the inner air lock door
- At 1215, the air lock interlock was defeated and the outer door opened and then closed
- At 1245, while entering the airlock to repair the inner door, the outer door malfunctioned and would not seal properly
- It is now 1250

Which ONE (1) of the following describes the correct action to be taken IAW ITS 3.6.2? (ATTACHED)

A. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1200 and verify an operable door closed by 1300.

B. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1215 and verify an operable door closed by 1315.

C. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1245 and verify an operable door closed by 1345.

D. Commence evaluation of overall CV leakage per LCO 3.6.1 by 1250 and verify an operable door closed by 1350.

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Lock

LCO 3.6.2 The containment air lock shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---------------------------------NOTES---------------------------------

1. Entry and exit is permissible to perform repairs on the affected air lock components.
2. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when air lock leakage results in exceeding the overall containment leakage rate.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment air lock door inoperable.	-----------NOTES----------- 1. Required Actions A.1, A.2, and A.3 are not applicable if both doors are inoperable and Condition C is entered. 2. Entry and exit is permissible for 7 days under administrative controls. ---------------------------	
	A.1 Verify the OPERABLE door is closed.	1 hour
	AND	
	A.2 Lock the OPERABLE door closed.	24 hours
	AND	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 --------NOTE-------- Air lock doors in high radiation areas may be verified locked closed by administrative means. ------------------- Verify the OPERABLE door is locked closed.	 Once per 31 days
B. Containment air lock interlock mechanism inoperable.	-----------NOTES----------- 1. Required Actions B.1, B.2, and B.3 are not applicable if both doors are inoperable and Condition C is entered. 2. Entry and exit of containment is permissible under the control of a dedicated individual. ---------------------------	
	B.1 Verify an OPERABLE door is closed.	1 hour
	<u>AND</u>	
	B.2 Lock an OPERABLE door closed.	24 hours
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.3	--------NOTE-------- Air lock doors in high radiation areas may be verified locked closed by administrative means. ------------------- Verify an OPERABLE door is locked closed.	Once per 31 days
C. Containment air lock inoperable for reasons other than Condition A or B.	C.1	Initiate action to evaluate overall containment leakage rate per LCO 3.6.1.	Immediately
	<u>AND</u>		
	C.2	Verify a door is closed in the air lock.	1 hour
	<u>AND</u>		
	C.3	Restore air lock to OPERABLE status.	24 hours
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	D.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1	------------------NOTES------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria of SR 3.6.1.1, in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions. --- Perform required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.	-----NOTE----- SR 3.0.2 is not applicable --------------- In accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	24 months

23. Given the following plant conditions:

- The plant has experienced a SBLOCA
- Safety systems have not functioned as designed
- Containment pressure is 4.2 psig
- RCS pressure is 1885 psig
- RCS subcooling is +2°F
- RVLIS Full range is 40 %
- All S/G pressures are 1030 psig
- Total AFW flow is 325 gpm
- S/G NR levels are:
    - A = 15%
    - B = 15%
    - C = 17%

Which ONE (1) of the following states the correct procedure to enter for these conditions?

A. FRP-H.2, RESPONSE TO STEAM GENERATOR OVERPRESSURE.

B. FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.

C. FRP-C.1, RESPONSE TO INADEQUATE CORE COOLING.

D. FRP-C.2, RESPONSE TO DEGRADED CORE COOLING.

24. Given the following plant conditions:

- Mode 1 at 100% RTP
- An increasing trend on RCS activity is being investigated by Chemistry personnel:
  I-131, 133
  Cs-134, 137, 138
- The IAO reports "A" Seal Injection Filter is reading 2.6 psid
- The on-shift RC technician reports "A" Seal Injection Filter is reading 26 Rem/hour

Which ONE (1) of the following describes the correct actions to be taken regarding the "A" Seal Injection Filter?

A. Monitor Filter D/P and radiation level once per shift, shift filter when D/P exceeds 3 psid.

B. Monitor Filter radiation level once per shift, shift filter when dose exceeds 30 R/hr.

C. Shift to the "B" Filter in service, change out "A" filter due to exceeding 25 Rem/hour.

D. Shift to the "B" Filter in service, change out "A" filter due to approaching 3 psid.

25. Given the following plant conditions:

- Mode 1 at 9% RTP
- The main generator has been synchronized with the grid, breakers 52/8 & 52/9 (North and South OCB's) are closed
- The dedicated feedwater operator announces that he/she has lost control of S/G levels and recommends a reactor trip
- All three (3) S/G levels are approaching the low level trip setpoint
- The Reactor Operator trips the reactor
- The turbine does not trip

Which ONE (1) of the following describes the correct turbine **and** crew response to this situation?

A. Turbine should **NOT** trip automatically. Crew should manually trip the turbine.

B. Turbine should **NOT** trip automatically. Crew should manually run the turbine back to zero on the setter.

C. Turbine should have automatically tripped. Crew should manually trip the turbine.

D. Turbine should have automatically tripped. Crew should manually run the turbine back to zero on the setter.

26. Given the following plant conditions:

- GP-007, PLANT COOLDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN, in progress
- Pressurizer PORV Overpressure selector switches have just been placed in OVERPRESSURE

Which ONE (1) of the following correctly interprets the logic required to Pressurizer PORV PCV-456?

The PORV would open if the auctioneered RCS wide range temperature function generator produces a signal that is _________than the pressure sensed by RCS pressure transmitter _______.

A. greater; PT-500.

B. less; PT-500.

C. greater; PT-445.

D. less; PT-445.

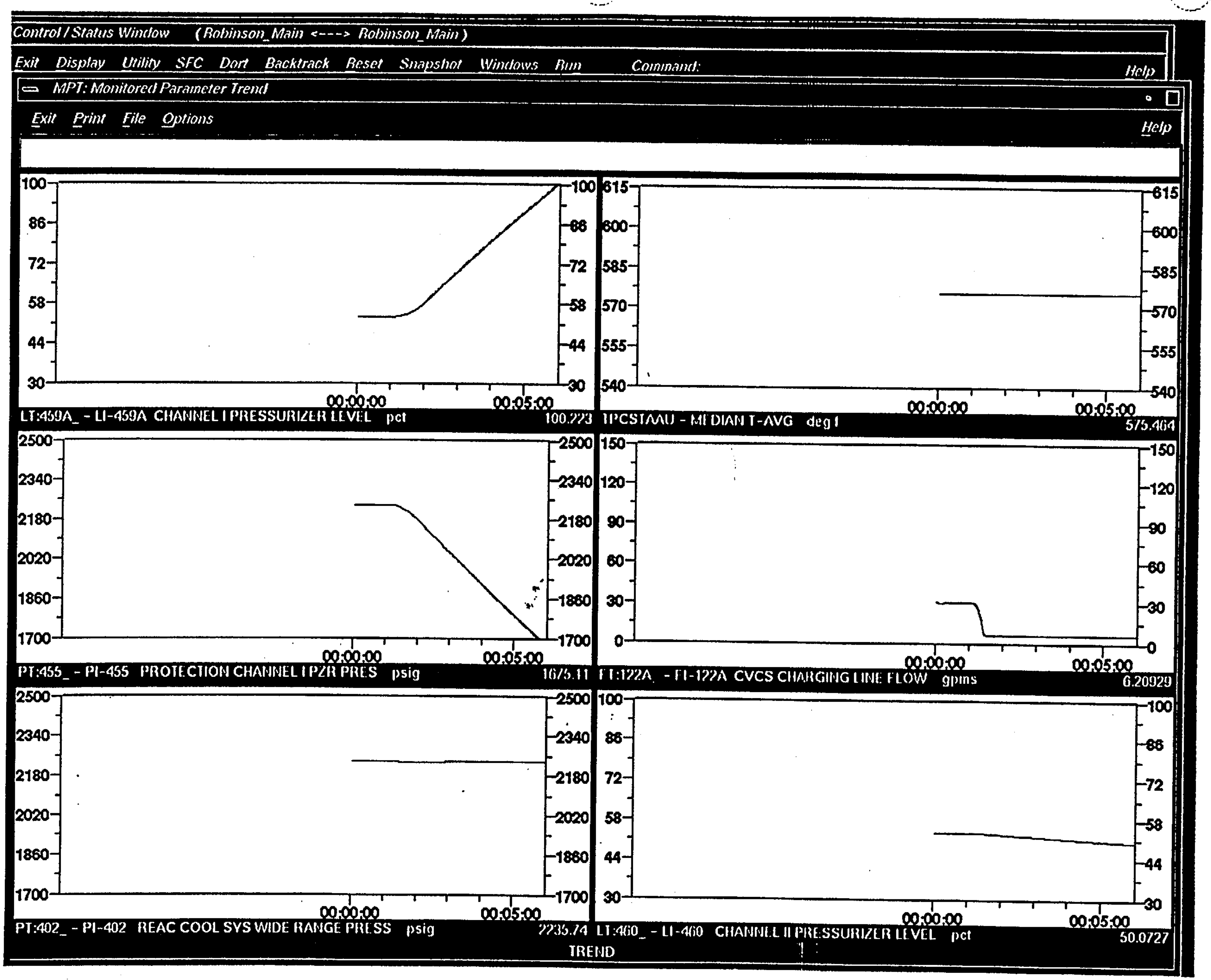
27. Using the attached parameter plots, which ONE (1) of the following describes the current RCS status?

    A. PZR Steam space leak.

    B. Leaking spray valve.

    C. PZR reference leg leak

    D. Leak from high pressure sensing line of LT-459



Control / Status Window (Robinson_Main <----> Robinson_Main)
Exit Display Utility SFC Dort Backtrack Reset Snapshot Windows Run Command: Help
MPT: Monitored Parameter Trend
Exit Print File Options Help
00:00:00 00:05:00
LT:459A_ - LI-459A CHANNEL I PRESSURIZER LEVEL pct 100.223
TPCSTAAU - MEDIAN T-AVG deg f 575.464
PT:455_ - PI-455 PROTECTION CHANNEL I PZR PRES psig 1675.11
FT:122A_ - FI-122A CVCS CHARGING LINE FLOW gpms 6.20929
PT:402_ - PI-402 REAC COOL SYS WIDE RANGE PRESS psig 2235.74
LT:460_ - LI-460 CHANNEL II PRESSURIZER LEVEL pct 50.0727
TREND

28. Given the following plant conditions:

- A reactor trip and SI have occurred
- Crew has responded IAW the EOP network
- Crew has entered EPP-9, TRANSFER TO COLD LEG RECIRCULATION due to low RWST level
- Shortly after entering EPP-9, the crew transitions to EPP-15, "LOSS OF EMERGENCY COOLANT RECIRCULATION"

Which ONE (1) of the following states conditions that would have warranted this transition to EPP-15?

A. Loss of E-1 and SI-759B failed closed.

B. Loss of E-2 and SI-759B failed closed.

C. Loss of E-1 and SI-861A failed closed.

D. Loss of E-2 and SI-861A failed closed.

29. Given the following plant conditions:

- Mode 1 at 100% RTP
- Two letdown orifices are in service; CVC-200A, 45 GPM ORIFICE ISOLATION, and CVC-200B, 60 GPM ORIFICE ISOLATION
- Pressurizer level is on program
- "A" charging pump is running in automatic
- "B" charging pump is in manual (45 gpm flow through the pump)
- All Seal Injection flows are 8 gpm each
- All Seal Return flows are 3 gpm each

Which ONE (1) of the following describes a correct plant response to a loss of electrical power to CVC-200A with **no operator action**?

If LC-459G, Pressurizer Level controller, is in:

A. automatic, the reactor will trip as a result of CVC-200A closing.

B. manual, the reactor will trip as a result of CVC-200A closing.

C. automatic, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

D. manual, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

30. Given the following plant conditions:

- Mode 4, proceeding to Mode 5
- RCS temperature is 210°F
- A large leak in the Component Cooling Water (CCW) system has developed
- AOP-014, COMPONENT COOLING WATER MALFUNCTION, has been entered
- The CCW pumps have been locked out

Which ONE (1) of the following describes the correct actions to be taken by the crew?

A. Exit AOP-014, Enter AOP-020.

B. Go to AOP-020, LOSS OF RHR, then stop all RHR pumps.

C. Continue in AOP-014 until the leak has been isolated, then evaluate recovery actions.

D. Stop all RHR pumps, then go to AOP-020, LOSS OF RHR, while continuing with AOP-014.

31. Given the following plant conditions:

- Mode 1 at 100% RTP
- A malfunction occurs in the Pressurizer Pressure controller
- RCS pressure increases to 2300 psig

Which ONE (1) of the following describes an effect on the plant as a result of the controller malfunction?

A. VCT level decreases.

B. Seal return flow increases.

C. Seal injection flow decreases.

D. Charging flow on FI-122 decreases.

32. Given the following plant conditions:

- A plant startup is in progress IAW GP-005, POWER OPERATION
- The unit is at 50% RTP

Using Attachment 6.1 (PROVIDED), which ONE (1) of the following describes the point in the attachment when the Manager - Operations was required to be notified?

A. Row A

B. Row B

C. Row C

D. Row D

REACTOR POWER ASCENSION INDICATOR LOG

	AVG PWR % (1)	NI-35 amps	NI-36 amps	NI-41A %	NI-42A %	NI-43A %	NI-44A %	LOOP ΔT °F (1)	LOOP 1 ΔT °F	LOOP 2 ΔT °F	LOOP 3 ΔT °F	1st STAGE PRESS psig (1)	PI-446 **OR 447** psig (2)	NET MWe MAX (1)	NET MWe	CCP % PWR (3)	NR-45 (4)	SSO (1)
A	15-20	6.0×10^{-5}	6.0×10^{-5}	18	16	16	15	9-11.5	10.5	11	11.3	68-90	75	73	50	16.7	16.5	[illegible]
B	25-30	1.0×10^{-4}	1.0×10^{-4}	29	28	29	29	14.5-17	17	17	17	113-135	135	153	150	28	29.5	[illegible]
C	35-40	1.3×10^{-4}	1.3×10^{-4}	39	36	38	33.5	20-23	22	22	22.5	158-180	165	235	205	36	36.5	[illegible]
D	45-50	1.6×10^{-4}	1.7×10^{-4}	48	48	46	47	26-28.5	27.5	27.5	28.5	207-230	230	316	305	48	47.0	[illegible]
	55-60							32-34.5				261-285		398				
	65-70							37-40				320-345		480				
	75-80							43-46				384-410		562				
	85-90							49-51.5				449-475		643				
	95-100							55-57.5				513-540		725				

(1) Listed ranges and Net MWe maximums are predicted based on past plant performance. The maximum value of each indication is the maximum target value for each power increase. The SSO shall initial if plant management has determined that indications are acceptable to continue with the power escalation.

(2) Use indicator that corresponds to the channel selected on the 1st STAGE PRESSURE selector switch.

(3) Record Continuous Calorimetric Program % Power.

(4) Verify NR-45 is selected to the highest reading channel.

33. Given the following plant conditions:

- Mode 1 at 100% RTP
- AOP-035, STEAM GENERATOR TUBE LEAK, has been entered due to a tube leak in "B" S/G
- The crew has commenced a normal plant shutdown IAW GP-006, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN

Which ONE (1) of the following describes the proper use of AOP-035 during the shutdown?

A. Performed in parallel with plant shutdown but would require use of GP-006 Attachment 6.1, RAPID SHUTDOWN.

B. Performed in parallel with plant shutdown. Exited if leak rate exceeds charging capacity.

C. Exited once plant shutdown commences. Only use if leak rate exceeds charging capacity.

D. Used at the discretion of the CRSS as "Information Use".

34. Given the following plant conditions:

- The crew is responding to multiple accident conditions
- S/G "C" is ruptured
- Path 2 has been entered and preparations are being made for dumping steam at the maximum rate from the intact S/G's
- Containment Pressure is 3.0 psig after peaking at 4.7 psig
- RCS Tcold is 492°F
- "C" S/G prssure is 250 psig above non-ruptured S/G pressure

Which ONE (1) of the following describes the required core exit temperature? Use the Attached table to make your determination.

A. 415°F

B. 435°F

C. 445°F

D. 465°F

From Path-2

DETERMINE REQUIRED CORE EXIT TEMP	
RUPTURED S/G PRESS (PSIG)	REQUIRED CORE EXIT TEMP (^oF)
GREATER THAN 1000	490 [470]
900 - 1000	480 [460]
800 - 899	465 [445]
700 - 799	450 [430]
600 - 699	435 [415]
500 - 599	415 [395]
400 - 499	395 [375]
300 - 399	365 [345]
250 - 299	340 [320]

35. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" condensate pump trips

Which ONE (1) of the following describes the **initial** feedwater system response to the above condition with **no operator action**?

All S/G feedwater regulating valves will:

A. close and both main feedwater pumps will trip.

B. close and only "A" main feedwater pump will trip.

C. open and only "A" main feedwater pump will trip.

D. open and both main feedwater pumps will trip.

36. Given the following plant conditions:

- A reactor trip and SI have occurred
- AFW flow < 300 gpm
- S/G WR levels are : "A"= 24%, "B"= 25%, "C" = 27%
- RCP's are secured
- RCS pressure is 2285 psig and increasing
- Crew initiates RCS bleed and feed

Which ONE (1) of the following describes the plant parameter/setpoint that directed the initiation of bleed and feed **and** the basis for it?

A. RCS pressure greater than 2280 psig; PZR PORV capability.

B. RCS pressure greater than 2280 psig; indication of imminent PORV lift.

C. 2 S/G WR levels less than 26%; PZR PORV capability.

D. 2 S/G WR levels less than 26%; indication of imminent S/G dryout.

37. Given the following plant conditions:

- Mode 1 at 100% RTP
- APP-036-D1, BATTERY CHARGER A/A-1 TROUBLE, is illuminated
- The AO reports that "A" Battery Charger has tripped and that there is an acrid odor in its vicinity

Using ITS 3.8.4 (PROVIDED), which ONE (1) of the following describes the correct crew response to this situation?

A. Implement action statements of LCO 3.8.4 and place Battery Charger A-1 in service within 2 hours.

B. Implement action statements of LCO 3.8.4 and place Battery Charger A-1 in service within 2 hours, **and** be in Mode 3 within 6 hours.

C. Initiate a Priority 1 Work Request and inform Maintenance that they have 2 hours to repair Battery Charger "A". Entry into LCO 3.8.4 is not required if repairs completed within 2 hours.

D. Initiate a Priority E Work Request and inform Maintenance that they have 2 hours to repair Battery Charger "A". Entry into LCO 3.8.4 is not required if repairs completed within 2 hours.

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources – Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1 Restore DC electrical power subsystem to OPERABLE status.	2 hours
B. Required Action and Associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 125.7 V on float charge.	7 days

(continued)

38. Given the following plant conditions:

- Waste Gas Decay Tank (WGDT) "A" is the IN SERVICE tank and has an identified leak
- Waste Gas Decay Tank "B" is in STANDBY and will be placed IN SERVICE per AOP-009, ACCIDENTAL GAS RELEASE FROM A WGDT

Which ONE (1) of the following correctly describes the basis for placing Waste Gas Decay Tank "B" IN SERVICE instead of Waste Gas Decay Tanks "C" or "D" under these conditions?

A. All actions can be performed from the Waste Disposal Boron Recycle Panel. The operator does not have to enter the WGDT Valve Gallery which may be a high airborne area.

B. Most actions can be performed from the Waste Disposal Boron Recycle Panel. The operator has to spend limited time in the WGDT Valve Gallery which may be a high airborne area.

C. All actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

D. Most actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

39. Which ONE (1) of the following lists the RMS channels designed to provide indication during and after an accident when radiation levels and/or environmental specifications of the other channels may be exceeded?

1. R-1, Control Room
2. R-2, CV Low Range Monitor
3. R-11, CV Air or Plant Stack, Particulate
4. R-12, CV Air or Plant Stack, Noble Gas
5. R-14C, Plant Stack, Noble Gas, Low Range
6. R-14D, Plant Stack, Noble Gas, Intermediate or Mid Range
7. R-14E, Plant Stack, Noble Gas, High Range
8. R-30, Fuel Handling Building, Lower Level, High Range Noble Gas
9. R-31A, B, C Main Steam Lines
10. R-32A, B CV High Range

A. 3, 4, 6, 7, 9, 10

B. 1, 5, 6, 8, 9, 10

C. 2, 6, 7, 9, 10

D. 6, 7, 8, 9, 10

40. Given the following plant conditions:

- Mode 1 at 100% RTP
- APP-001-E7,INST AIR COMP D TRIP, illuminates
- APP-001-F7, INST AIR HDR LO PRESS, illuminates
- The RO reports Instrument Air header pressure is 83 psig and decreasing
- AOP-017, LOSS OF INSTRUMENT AIR, is entered, and the transition made to Section A, POWER OPERATION
- The BOP announces that "C" FRV is slowly drifting in the CLOSED direction

Which ONE (1) of the following describes the correct crew response to these conditions?

A. Go to the main body of AOP-017 to determine the need to cross-connect Station Air and Instrument Air. Decrease turbine loading as necessary to maintain feed and steam flows matched.

B. Continue in Section A. Cross-connect Station Air and Instrument Air to regain control of "C" FRV.

C. Trip the reactor and go to Path 1 while continuing with Section A of AOP-017.

D. Trip the reactor and go to Path 1, continue with AOP-017 but now go to Section B, HOT SHUTDOWN.

41. Given the following plant conditions:

- Mode 1 at 100% RTP
- LT 459, Pressurizer Level Transmitter, has failed low
- Crew enters AOP-025, "RTGB INSTRUMENT FAILURE"
- An operable level channel is selected and APP-003-C3, PRT HI PRESS, is received

Which ONE (1) of the following describes the cause of the PRT alarm?

CVC-460 A&B, LETDOWN ISOLATION STOPS
CVC-203A, LETDOWN RELIEF
CVC-209, LP LETDOWN RELIEF

A. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-203A lifted.

B. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-209 lifted.

C. Letdown isolation caused CVC-209 to lift.

D. Letdown isolation caused CVC-203A to lift.

42. Given the following plant conditions:

- The plant was operating at 100% RTP
- All systems are in their normal configuration
- A Loss of Off-Site Power occurred and EPP-1, LOSS OF ALL AC POWER, was entered
- The EDG's have been started from the RTGB and the output breakers closed
- Service Water pumps have been started by the blackout sequencer
- An SI occurs immediately after SW pumps started

Which ONE (1) of the following describes the response to this event?

The Blackout sequence will:

A. continue to completion, any additional equipment will be started by the SI sequence.

B. continue to completion, any additional equipment will require a manual start.

C. stop, all loads will be stripped and restarted by the SI sequence.

D. stop, the SI sequence will start the required additional loads.

43. Given the following plant conditions:

- FRP-H.2, RESPONSE TO S/G OVERPRESSURE, is in effect
- STA is monitoring CSFST's
- The crew is monitoring the affected S/G level as directed by procedure

Which ONE (1) of the following correctly describes the importance for monitoring level?

A. When S/G level is > 75%, S/G may be water solid, stay in FRP-H.2.

B. When S/G level is > 90%, S/G may be water solid, transition to FRP-H.3, Response to Steam Generator High Level.

C. When S/G level is > 75%, S/G PORV may be water solid, transition to FRP-H.3, Response to Steam Generator High Level.

D. When S/G level is > 90%, S/G PORV may be water solid, stay in FRP-H.2.

44. Given the following plant conditions:

- Mode 1 at 60% RTP
- The rods are selected to MANUAL
- Control rod (M-6) drops to the bottom of the core

Which ONE (1) of the following describes the integrated plant response to the rod drop and the reason for the response? **(Assume no operator action)**

A. APP-003-F3, CHG PMP LO SPEED, illuminates due to the reactivity inserted by the dropped rod.

B. APP-003-F3, CHG PMP LO SPEED, illuminates due to mismatch between reactor power and steam demand.

C. APP-003-F4, CHG PMP HI SPEED, illuminates due to mismatch between reactor power and steam demand.

D. APP-003-F4, CHG PMP HI SPEED, illuminates due to the reactivity inserted by the dropped rod.

45. Given the following plant conditions:

- Mode 1 at 95% RTP
- A flux tilt of 1.038 exists
- Rod K-14 appears to be misaligned
- This condition cannot be corrected for at least 2.5 hours

Using ITS 3.2.4 (ATTACHED), which ONE (1) of the following correctly describes the correct power reduction?

Reduce core power to:

A. 98.8%.

B. 94.8%.

C. 88.6%.

D. 83.6%.

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be ≤ 1.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. QPTR not within limit.	A.1	Reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	2 hours
	<u>AND</u>		
	A.2	Determine QPTR and reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	Once per 12 hours
	<u>AND</u>		
	A.3	Perform SR 3.2.1.1 and SR 3.2.2.1.	24 hours <u>AND</u> Once per 7 days thereafter
	<u>AND</u>		
	A.4	Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
	<u>AND</u>		
			(continued)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.4.1	-----------------NOTES----------------- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER < 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. -- Verify QPTR is within limit by calculation.	7 days <u>AND</u> Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable.
SR 3.2.4.2	-----------------NOTE----------------- Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER ≥ 75% RTP. -- Verify QPTR is within limit using the movable incore detectors.	Once within 12 hours <u>AND</u> 12 hours thereafter

46. Given the following plant conditions:

- Mode 1 at 35% RTP
- Two charging pumps are running
- The following RCP indications are observed:

	RCP "A"	RCP "B"	RCP "C"
o RCP motor bearing temperatures	180°F	180°F	210°F
o #1 seal leakoff temperatures	150°F	150°F	165°F
o Thermal barrier delta P	10"	10"	8"

Which ONE (1) of the following describes the action(s) required for this condition?

A. Stop "C" RCP, shutdown IAW GP-006, Normal Plant Shutdown From Power Operation To Hot Shutdown, and be in Mode 3 within 6 hours.

B. Throttle CVC-297C, "C" RCP Seal Water Flow Control valve, to obtain between 8 and 13 gpm flow to each "C" RCP Seals.

C. Close CVC-303C, "C" RCP Seal Leakoff valve.

D. Trip the reactor, stop RCP "C".

47. Given the following plant conditions:

- Plant has experienced a loss of off-site power
- Reactor trip & turbine trip have been verified
- Crew entered EPP-1, LOSS OF ALL AC POWER, until the inside AO restored power to E-2 per Attachment 6 of EPP-1.
- Crew has returned to Path-1
- No SI has occurred or is required

Which ONE (1) of the following correctly describes how "Verify two charging pumps running" of PATH-1 will be completed?

Operator will start ___ charging pump from the "B" EDG and then ____charging pump from the DS bus after energizing it from the DS EDG per EPP-25, ENERGIZING SUPPLEMENTAL PLANT EQUIPMENT USING THE DSDG

A. "B" ; "A"

B. "C" ; "B"

C. "B" ; "C"

D. "C" ; "A"

48. Given the following plant conditions:

- The RCS is on RHR and solid
- RCS pressure is 350 psig
- RCS temperature is stable
- HIC-142, LETDOWN, controller setting is at 40% demand
- PC-145, PRESSURE, is in AUTO
- The Reactor operator adjusts HIC-142 controller to 80% demand

Which ONE (1) of the following statements is correct?

A. Letdown pressure increases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure decreases.

B. Letdown pressure increases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure decreases.

C. Letdown pressure decreases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure increases.

D. Letdown pressure decreases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure increases.

49. Given the following plant conditions:

- A DBA LOCA has occurred
- An electrical fault results in a loss of E-1

Which ONE (1) of the following describes the effects of the loss of E-1 on containment conditions?

A. Adequate equipment is operating to provide the required cooling for containment in this event.

B. Inadequate SW booster pumps are operating to maintain containment conditions within design limits.

C. Inadequate CV spray pumps are operating to maintain containment conditions within design limits.

D. Inadequate HVH units are operating to maintain containment conditions within design limits.

50. Given the following plant conditions:

- Reactor trip and SI have occurred
- Failure of SI status lights has occurred
- CRSS has directed the RO to verify the CVCS related SI valves CLOSED using RTGB indication

Which ONE (1) of the following correctly describes the CVCS valves required to be verified closed?

A. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Line Isol valves (CVC-204A & 204B)

B. Letdown Line Isol valves (CVC-204A & 204B) and Letdown Stop valves (CVC-460A & 460B)

C. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Stop valves (CVC-460A & 460B)

D. Letdown Line Isol valves (CVC-204A & 204B) and Seal Water Return Isol valve (CVC-381)

51. Given the following plant conditions;

- Mode 1 at 100% RTP
- All control systems are in automatic

Assuming no operator action, which ONE (1) of the following describes the response of the rod control system if Power Range Nuclear Instrument Channel N-44 fails full upscale?

A. No rod movement will occur because of the Overpower rod stop from N-44 failure.

B. Nuclear power - Turbine power mismatch signal steps rods in until the signal decays, then rod motion stops.

C. Nuclear power - Turbine power mismatch signal steps rods in until the Tavg-Tref mismatch signal overrides it.

D. Nuclear power - Turbine power mismatch signal steps rods in as long as N-44 is energized.

52. Given the following plant conditions:

- The plant was initially at 95% RTP and increasing following a refueling outage
- The reactor has tripped
- Compensating voltage on N-35, Intermediate Range NI, is set too high

Which ONE (1) of the following describes the response of Intermediate Range N-35 to the improperly set compensating voltage?

A. Indicates LOW; causing P-6 to energize the Source Range instruments prematurely.

B. Indicates HIGH; preventing P-6 from automatically energizing the Source Range instruments.

C. Indicates HIGH; the Source Range instruments will be energized by P-6 from the other IR channel (N-36).

D. Indicates LOW; the Source Range instruments will be energized when P-6 is satisfied by the other IR channel (N-36).

53. Given the following plant conditions:

- Mode 1 at 100% RTP
- An NAS Assessment identifies that the feedwater temperature indicators are inaccurate
- It is determined that the feedwater temperature detectors shows an indicated temperature that is LOWER than ACTUAL
- These readings were used in OST-10, POWER RANGE CALORIMETRIC DURING POWER OPERATION DAILY
- The power range detectors were adjusted using the OST

Which ONE (1) of the following correctly describes the results of the feedwater error on the power range calorimetric?

Indicated power is _______ than ~~calculated~~ actual power causing a _______ conservative NI setting.

A. LOWER; MORE

B. HIGHER; MORE

C. LOWER; LESS

D. HIGHER; LESS

54. Given the following plant conditions:

- APP-036-01, CH A ICCM SYS MALF is illuminated

Which ONE(1) of the following describes the RVLIS component that could cause this alarm to actuate and what condition is it indicating?

A microswitch located in the:

A. Sensor Bellows; RCS leak.

B. Sensor Bellows; capillary line leak.

C. Hydraulic Isolator; RCS leak.

D. Hydraulic Isolator; capillary line leak.

55. Which ONE (1) of the following describes the difference between an automatic and a manual spray actuation?

A. Containment Phase B Isolation and Containment Ventilation Isolation only occur on a manual actuation.

B. Containment Phase B Isolation and Containment Ventilation Isolation only occur on an automatic actuation.

C. Safety Injection and Steamline Isolation only occur on a manual actuation.

D. Safety Injection and Steamline Isolation only occur on an automatic actuation.

56. Given the following plant conditions:

- Crew is in FRP-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL
- S/G levels are as follows:

	S/G "A"	S/G "B"	S/G "C"
◊ Wide range levels	27%	7%	29%

- AFW flowrate to each S/G is 70 gpm

Which ONE (1) of the following defines the maximum allowed AFW flow rates to the S/G's?

Establish AFW flow:

A. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 80 gpm to S/G "B" until WR level is >9%.

B. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 100 gpm to S/G "B" until WR level is >9%.

C. less than or equal to 80 gpm to each S/G until NR level is >10%.

D. less than or equal to 100 gpm to each S/G until NR level is >10%.

57. Given the following plant conditions:

- Mode 1 at 30% RTP
- A reactor trip occurs
- All systems operate as expected
- Tave = Tref.

Which ONE (1) of the following correctly describes the status of secondary plant components for the above conditions?

A. Feed regulating valves are open, feed regulating bypass valves are open.

B. Feed regulating valves are open, feed regulating bypass valves are closed.

C. Feed regulating valves are closed, feed regulating bypass valves are open.

D. Feed regulating valves are closed, feed regulating bypass valves are closed.

58. Given the following plant conditions:

- The plant has experienced a trip from 100% RTP

Upon initiation of AFW, which ONE (1) of the following correctly describes the automatic response of the AFW system to these conditions?

A. The normally closed MDAFW pump discharge flow control valves (FCV 1424 and 1425) fully open.

B. The normally open SDAFW pump discharge flow control valve (FCV 6416) throttles closed.

C. The normally closed SDAFW pump discharge flow control valve (FCV 6416) throttles open.

D. The normally open MDAFW pump discharge flow control valves (FCV 1424 and 1425) throttle closed.

59. Given the following plant conditions:

- Mode 1 at 100% RTP
- A liquid release is in progress
- All systems are in a normal lineup and functioning properly

Which ONE (1) of the following identifies a Control Room indication that allows monitoring of the release?

A. Position of RCV-018, LIQUID WASTE EFFLUENT ISOLATION.

B. R-18, LIQUID WASTE DISPOSAL EFFLUENT.

C. YIC-1676, LIQUID RELEASE TOTALIZER.

D. FI-1064, RELEASE FLOW RATE.

60. Given the following plant conditions:

- Mode 3
- A release is in progress from "B" Waste Gas Decay Tank
- R-14C, PLANT STACK NOBLE GAS LOW RANGE, FAIL light illuminates

Which ONE (1) of the following conditions in the Control Room would also exist **and** what would be the effect of the above condition on RCV-014 (WASTE GAS RELEASE ISOLATION)?

A. APP-036-E7, RTGB RAD MONITOR TROUBLE; RCV-014 remains open.

B. APP-036-E7, RTGB RAD MONITOR TROUBLE; RCV-014 closes.

C. APP-036-D8, RTGB PROCESS MONITOR HI RAD; RCV-014 remains open.

D. APP-036-D8, RTGB PROCESS MONITOR HI RAD; RCV-014 closes.

61. Given the following plant conditions:

- Mode 1 at 100% RTP
- A release is in progress from Waste Gas Decay Tank "A"
- A loss of Instrument Bus 2 occurs

Which ONE (1) of the following describes the effect on the release based upon the instrument bus loss?

The release:

A. is automatically terminated due to loss of R-14 (PLANT VENT MONITOR).

B. must be manually terminated due to loss of R-14 (PLANT VENT MONITOR).

C. must be manually terminated due to loss power to the Waste Disposal Boron Recycle Panel.

D. is automatically terminated due to loss of power to the Waste Disposal Boron Recycle Panel.

62. Which ONE (1) of the following provides the basis for R-14D, Plant Vent Mid-Range Noble Gas, alarm setpoint?

A. 10CF20 most restrictive dose rate of 500 mr/yr total body.

B. 50 mr/hr at site boundary for a release of 30 minutes duration.

C. 3000 mr/yr to the skin.

D. 30 mr/hr at site boundary for a release of 1 hour duration.

63. During a drain of the RCS IAW GP-008, DRAINING THE REACTOR COOLANT SYSTEM, the hoses connected to the Pressurizer Relief loop seal drains are required to be removed after the seals are drained.

Which ONE (1) of the following provides the correct reason for removing these hoses?

A. AP-010, Housekeeping Instructions. Hoses are a trip hazard and want to minimize the potential for falls inside Containment.

B. Radiactive material issue. Need the hoses for additional drains which minimizes the amount of radioactive hoses generated by not having seperate hoses for each drain evolution.

C. MMM-010, Cleanliness and Flushing. If end of hose became submerged, could siphon water from the floor drain into the RCS and introduce contaminants.

D. Vent path concern. Eliminates the potential for hose collapse which would prevent air draw.

64. Given the following plant conditions:

- Mode 1 at 100% RTP
- The following annunciators are illuminated:
  - APP-003-D8, PZR CONTROL HI/LO PRESS
  - APP-003-E8, PZR CONTROL HI/LO LVL
  - APP-003-F4, CHG PUMP HI SPEED
- You have just entered, AOP-016, Excessive RCS Leakage
- Pressurizer level is 28%
- RCS pressure is approaching 2000 psig

Which ONE (1) of the following describes the correct response for the above conditions?

A. Automatic trip due to OPΔT.

B. Manual reactor trip due to loss of subcooling.

C. Automatic reactor trip due to Lo Pressrurizer pressure.

D. Manual trip due to approaching Safety Injection setpoint.

65. Given the following plant conditions:

- Shutdown following a reactor trip
- APP-004-B2, PZR LO PRESS TRIP, is flashing
- RCS Pressure is 1825 psig
- Pressurizer level is 13% and decreasing at 2%/min
- RCS Temperature is 547°F
- "B" and "C" charging pumps are running
- You are in EPP-4, Post Trip Response

Which ONE (1) of the following describes the correct response upon opening Foldout "A"?

A. Start both Safety Injection pumps.

B. Verify Letdown isolated and start "A" charging pump.

C. Initiate Safety Injection.

D. Secure all RCP's.

66. Given the following plant conditions:

- Mode 1 at 100% RTP
- PC-444J fails high

Which ONE (1) of the following describes the correct plant response if **NO** operator actions are taken?

A. All pressurizer heaters energize as plant pressure decreases.

B. Pressurizer Spray valves shut and the PORV's cycle to control pressure.

C. A reactor trip and safety injection occur on low Pressurizer pressure.

D. An OPΔT trip occurs.

67. Given the following plant conditions:

- Mode 1 at 100% RTP
- The crew is making preparations to commence a normal shutdown. A boration is in progress
- As part of the preparations, an additional letdown orifice is being placed in service
- The operator misses the step to adjust charging flow to match the expected letdown flow

Which ONE (1) of the following describes a plant response/indication resulting from the missed step?

A. VCT level decreases.

B. Charging pump speed decreases.

C. APP-001-B6, LP LTDN LN HI TEMP, illuminated.

D. TCV-143, VCT/DEMINERALIZER DIVERSION, diverts to VCT.

68. Given the following plant conditions:

- Mode 1
- A normal plant shutdown IAW GP-006 is in progress
- NIS: N41 = 9%, N42 = 9%, N43 = 9%, N44 = 10%
- Turbine first stage pressure is 60 psig
- "B" RCP trips due to a breaker malfunction

Which ONE (1) of the following describes the plant condition?

The plant is:

A. greater than P-7. The reactor trips.

B. greater than P-7. The reactor does not trip.

C. less than P-7. The reactor trips.

D. less than P-7. The reactor does not trip.

69. Given the following plant conditions:

- The reactor is critical at the following power level:
  - N31 = 42,000 cps
  - N32 = 46,000 cps
  - N35 = $<1\times10^{-11}$ amps
  - N36 = 8×10^{-11} amps
- APP-005-C2, IR DET LOSS OF VOLT, is illuminated

Using the provided copy of ITS 3.3.1, which ONE (1) of the following specifies the correct required action?

A. Increase power to >P-10 within 2 hours.

B. Restore N35 to service prior to going >P-6.

C. Verify P-6 2x2 status light is illuminated within one hour.

D. Reduce power to < P-6 within 2 hours.

3.3 INSTRUMENTATION

3.3.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1 The RPS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately
B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Open reactor trip breakers (RTBs).	55 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status. OR C.2 Open RTBs.	48 hours 49 hours
D. One Power Range Neutron Flux-High channel inoperable.	D.1.1 Place channel in trip. AND D.1.2 Reduce THERMAL POWER to ≤ 75% RTP. OR D.2.1 Place channel in trip. AND -------------NOTE------------ Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable. ----------------------------- D.2.2 Perform SR 3.2.4.2. OR D.3 Be in MODE 3.	6 hours 12 hours 6 hours Once per 12 hours 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One channel inoperable.	E.1 Place channel in trip. OR E.2 Be in MODE 3.	6 hours 12 hours
F. THERMAL POWER > P-6 and < P-10, one Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6. OR F.2 Increase THERMAL POWER to > P-10.	2 hours 2 hours
G. THERMAL POWER > P-6 and < P-10, two Intermediate Range Neutron Flux channels inoperable.	G.1 Suspend operations involving positive reactivity additions. AND G.2 Reduce THERMAL POWER to < P-6.	Immediately 2 hours
H. THERMAL POWER < P-6, one or two Intermediate Range Neutron Flux channels inoperable.	H.1 Restore channel(s) to OPERABLE status.	Prior to increasing THERMAL POWER to > P-6
I. One Source Range Neutron Flux channel inoperable.	I.1 Suspend operations involving positive reactivity additions.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
J. Two Source Range Neutron Flux channels inoperable.	J.1	Open RTBs.	Immediately
K. One Source Range Neutron Flux channel inoperable.	K.1	Restore channel to OPERABLE status.	48 hours
	<u>OR</u>		
	K.2	Open RTBs.	49 hours
L. Required Source Range Neutron Flux channel(s) inoperable.	L.1	Suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>		
	L.2	Close unborated water source isolation valves.	1 hour
	<u>AND</u>		
	L.3	Perform SR 3.1.1.1.	1 hour <u>AND</u> Once per 12 hours thereafter

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
M. One channel inoperable.	M.1	Place channel in trip.	6 hours
	<u>OR</u>		
	M.2	Reduce THERMAL POWER to < P-7.	12 hours
N. One Reactor Coolant Flow - Low (Single Loop) channel inoperable.	N.1	Place channel in trip.	6 hours
	<u>OR</u>		
	N.2	Reduce THERMAL POWER to < P-8.	10 hours
O. One Reactor Coolant Pump Breaker Position channel inoperable.	O.1	Restore channel to OPERABLE status.	6 hours
	<u>OR</u>		
	O.2	Reduce THERMAL POWER to < P-8.	10 hours
P. One Turbine Trip channel inoperable.	P.1	Place channel in trip.	6 hours
	<u>OR</u>		
	P.2	Reduce THERMAL POWER to < P-7.	10 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Q. One train inoperable.	-----------NOTE----------- One train may be bypassed for up to 12 hours provided the other train is OPERABLE. -------------------------	
	Q.1 Restore train to OPERABLE status.	6 hours
	<u>OR</u>	
	Q.2 Be in MODE 3.	12 hours
R. One RTB train inoperable.	-----------NOTE----------- One train may be bypassed for up to 12 hours, provided the other train is OPERABLE. -------------------------	
	R.1 Restore train to OPERABLE status.	1 hour
	<u>OR</u>	
	R.2 Be in MODE 3.	7 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
S. One channel inoperable.	S.1	Verify interlock is in required state for existing unit conditions.	1 hour
	<u>OR</u>		
	S.2	Be in MODE 3.	7 hours
T. One channel inoperable.	T.1	Verify interlock is in required state for existing unit conditions.	1 hour
	<u>OR</u>		
	T.2	Be in MODE 2.	7 hours
U. One trip mechanism inoperable for one RTB.	U.1	Restore inoperable trip mechanism to OPERABLE status.	48 hours
	<u>OR</u>		
	U.2.1	Be in MODE 3.	54 hours
	<u>AND</u>		
	U.2.2	Open RTB.	55 hours
V. Two RPS trains inoperable.	V.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

---------------------------------------NOTE---------------------------------------
Refer to Table 3.3.1-1 to determine which SRs apply for each RPS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	------------------NOTES------------------ 1. Adjust NIS channel if absolute difference is > 2%. 2. Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output.	24 hours
SR 3.3.1.3	------------------NOTES------------------ 1. Adjust NIS channel if absolute difference is ≥ 3%. 2. Not required to be performed until 36 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of the incore detector measurements to NIS AFD.	31 effective full power days (EFPD)

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.4	------------------NOTE------------------ This Surveillance must be performed on the reactor trip bypass breaker prior to placing the bypass breaker in service. -- Perform TADOT.	 31 days on a STAGGERED TEST BASIS
SR 3.3.1.5	------------------NOTE------------------ Not required to be performed for the logic inputs from Source Range Neutron Flux detector prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -- Perform ACTUATION LOGIC TEST.	 31 days on a STAGGERED TEST BASIS
SR 3.3.1.6	------------------NOTE------------------ Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. -- Calibrate excore channels to agree with incore detector measurements.	 92 EFPD
SR 3.3.1.7	------------------NOTE------------------ Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -- Perform COT.	 92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8	------------------NOTE------------------ This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. -- Perform COT.	-----NOTE----- Only required when not performed within previous 92 days -------------- Prior to reactor startup AND Four hours after reducing power below P-10 for power and intermediate instrumentation AND Four hours after reducing power below P-6 for source range instrumentation AND Every 92 days thereafter

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	------------------NOTE------------------ Verification of setpoint is not required. -- Perform TADOT.	92 days
SR 3.3.1.10	------------------NOTE------------------ This Surveillance shall include verification that the time constants are adjusted to the prescribed values where applicable. -- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.1.11	------------------NOTE------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.1.12	------------------NOTE------------------ This Surveillance shall include verification that the electronic dynamic compensation time constants are set at the required values, and verification of RTD response time constants. -- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.1.13	Perform COT.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.14	------------------NOTE------------------ Verification of setpoint is not required. -- Perform TADOT.	18 months
SR 3.3.1.15	------------------NOTE------------------ Verification of setpoint is not required. -- Perform TADOT.	-----NOTE----- Only required when not performed within previous 31 days -------------- Prior to reactor startup

Table 3.3.1-1 (page 1 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT (1)
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA	NA
	$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	C	SR 3.3.1.14	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11	≤ 110.93% RTP	108% RTP (2)
b. Low	$1^{(b)}$,2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 26.93% RTP	24% RTP
3. Intermediate Range Neutron Flux	$1^{(b)}$, $2^{(c)}$	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 37.02% RTP	25% RTP
	$2^{(d)}$	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 37.02% RTP	25% RTP
4. Source Range Neutron Flux	$2^{(d)}$	2	I,J	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.28 E5 cps	1.0 E5 cps
	$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	J,K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.28 E5 cps	1.0 E5 cps
	$3^{(e)}$, $4^{(e)}$, $5^{(e)}$	1	L	SR 3.3.1.1 SR 3.3.1.11	N/A	N/A

(continued)

(1) A channel is OPERABLE with an actual Trip Setpoint value found outside its calibration tolerance band provided the Trip Setpoint value is conservative with respect to its associated Allowable Value and the channel is re-adjusted to within the established calibration tolerance band of the Nominal Trip Setpoint.
(2) The Nominal Trip Setpoint is as stated unless reduced as required by one or more of the following requirements: LCO 3.2.1 Required Action A.2.2; LCO 3.2.2 Required Action A.1.2.2; or LCO 3.7.1 Required Action B.2.
(a) With Rod Control System capable of rod withdrawal, or one or more rods not fully inserted.
(b) Below the P-10 (Power Range Neutron Flux) interlock.
(c) Above the P-6 (Intermediate Range Neutron Flux) interlock.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(e) With the RTBs open. In this condition, source range Function does not provide reactor trip but does provide indication and alarm.

Table 3.3.1-1 (page 2 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT (1)
5. Overtemperature ΔT	1,2	3	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12	Refer to Note 1 (Page 3.3-18)	Refer to Note 1 (Page 3.3-18) (3)
6. Overpower ΔT	1,2	3	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12	Refer to Note 2 (Page 3.3-19)	Refer to Note 2 (Page 3.3-19) (3)
7. Pressurizer Pressure						
a. Low	1(f)	3	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 1832.02 psig	1844 psig
b. High	1,2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 2381.11 psig	2376 psig
8. Pressurizer Water Level – High	1(f)	3	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 91.64%	91%

(continued)

(1) A channel is OPERABLE with an actual Trip Setpoint value found outside its calibration tolerance band provided the Trip Setpoint value is conservative with respect to its associated Allowable Value and the channel is re-adjusted to within the established calibration tolerance band of the Nominal Trip Setpoint.
(3) The Nominal Trip Setpoint is as stated unless reduced as required by LCO 3.2.1 Required Action A.2.3.
(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

Table 3.3.1-1 (page 3 of 7)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT (1)
9.	Reactor Coolant Flow - Low						
	a. Single Loop	$1^{(g)}$	3 per loop	N	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 93.47%	94.26%
	b. Two Loops	$1^{(h)}$	3 per loop	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 93.47%	94.26%
10.	Reactor Coolant Pump (RCP) Breaker Position						
	a. Single Loop	$1^{(g)}$	1 per RCP	O	SR 3.3.1.14	NA	NA
	b. Two Loops	$1^{(h)}$	1 per RCP	M	SR 3.3.1.14	NA	NA
11.	Undervoltage RCPs	$1^{(f)}$	1 per bus	M	SR 3.3.1.9 SR 3.3.1.10	≥ 2959 V	3120 V
12.	Underfrequency RCPs	$1^{(f)}$	1 per bus	M	SR 3.3.1.10 SR 3.3.1.14	≥ 57.84 Hz	58.2 Hz
13.	Steam Generator (SG) Water Level - Low Low	1,2	3 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 15.36%	16%

(continued)

(1) A channel is OPERABLE with an actual Trip Setpoint value found outside its calibration tolerance band provided the Trip Setpoint value is conservative with respect to its associated Allowable Value and the channel is re-adjusted to within the established calibration tolerance band of the Nominal Trip Setpoint.
(f) Above the P-7 (Low Power Reactor Trips Block) interlock.
(g) Above the P-8 (Power Range Neutron Flux) interlock.
(h) Above the P-7 (Low Power Reactor Trips Block) interlock and below the P-8 (Power Range Neutron Flux) interlock.

Table 3.3.1-1 (page 4 of 7)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT (1)
14.	SG Water Level - Low	1,2	2 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 29.36%	30%
	Coincident with Steam Flow/ Feedwater Flow Mismatch	1,2	2 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 7.06 E5 lbm/hr	6.4 E5 lbm/hr
15.	Turbine Trip						
	a. Low Auto Stop Oil Pressure	1(f)	3	P	SR 3.3.1.10 SR 3.3.1.15	≥ 40.87 psig	45 psig
	b. Turbine Stop Valve Closure	1(f)	2	P	SR 3.3.1.15	NA	NA
16.	Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	Q	SR 3.3.1.14	NA	NA

(continued)

(1) A channel is OPERABLE with an actual Trip Setpoint value found outside its calibration tolerance band provided the Trip Setpoint value is conservative with respect to its associated Allowable Value and the channel is re-adjusted to within the established calibration tolerance band of the Nominal Trip Setpoint.

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

Table 3.3.1-1 (page 5 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT (1)
17. Reactor Protection System Interlocks						
a. Intermediate Range Neutron Flux, P-6	2(d)	2	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7.29 E-11 amp	1 E-10 amp
b. Low Power Reactor Trips Block, P-7	1	1 per train	T	SR 3.3.1.13 SR 3.3.1.14	NA	NA
c. Power Range Neutron Flux, P-8	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 42.94% RTP	40% RTP
d. Power Range Neutron Flux, P-10	1,2	4	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7.06% RTP and ≤ 12.94% RTP	10% RTP
e. Turbine Impulse Pressure, P-7 input	1	2	T	SR 3.3.1.1 SR 3.3.1.10 SR 3.3.1.13	≤ 10.71% turbine power	10% turbine power
18. Reactor Trip Breakers(i)	1,2	2 trains	R,V	SR 3.3.1.4	NA	NA
	3(a), 4(a), 5(a)	2 trains	C,V	SR 3.3.1.4	NA	NA
19. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1,2	1 each per RTB	U	SR 3.3.1.4	NA	NA
	3(a), 4(a), 5(a)	1 each per RTB	C	SR 3.3.1.4	NA	NA
20. Automatic Trip Logic	1(j),2	2 trains	Q,V	SR 3.3.1.5	NA	NA
	3(a), 4(a), 5(a)	2 trains	C,V	SR 3.3.1.5	NA	NA

(1) A channel is OPERABLE with an actual Trip Setpoint value found outside its calibration tolerance band provided the Trip Setpoint value is conservative with respect to its associated Allowable Value and the channel is re-adjusted to within the established calibration tolerance band of the Nominal Trip Setpoint.
(a) With Rod Control System capable of rod withdrawal, or one or more rods not fully inserted.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(i) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.
(j) Below the P-6 (Intermediate Range Neutron Flux) interlock for the logic inputs from Source Range Neutron Flux detector channels.

Table 3.3.1-1 (page 6 of 7)
Reactor Protection System Instrumentation

Note 1: Overtemperature ΔT

The Overtemperature ΔT Function Allowable Value shall not exceed the following Nominal Trip Setpoint by more than 2.96% of ΔT span.

$$\Delta T_{setpoint} \le \Delta T_0 \left\{ K_1 - K_2 \frac{(1+\tau_1 S)}{(1+\tau_2 S)}(T - T') + K_3(P - P') - f(\Delta I) \right\}$$

Where: ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T' is the reference T_{avg} at RTP, ≤ 575.4°F.

P is the measured pressurizer pressure, psig
P' is the nominal RCS operating pressure, ≤ 2235 psig

$K_1 \le 1.1265$	$K_2 = 0.01228/°F$	$K_3 = 0.00089/psig$
$\tau_1 \ge 20.08$ sec	$\tau_2 \le 3.08$ sec	

$f(\Delta I) =$	$2.4\{(q_b - q_t) - 17\}$	when $q_t - q_b < -17\%$ RTP
	0% of RTP	when -17% RTP $\le q_t - q_b \le 12\%$ RTP
	$2.4\{(q_t - q_b) - 12\}$	when $q_t - q_b > 12\%$ RTP

Where q_t and q_b are percent RTP in the upper and lower halves of the core, respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RTP.

Table 3.3.1-1 (page 7 of 7)
Reactor Protection System Instrumentation

Note 2: Overpower ΔT

The Overpower ΔT Function Allowable Value shall not exceed the following Nominal Trip Setpoint by more than 3.17% of ΔT span.

$$\Delta T_{setpoint} \le \Delta T_0 \left\{ K_4 - K_5 \left[\frac{\tau_3 s}{1 + \tau_3 s} \right] T - K_6 (T - T') - f(\Delta I) \right\}$$

Where: ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T' is the reference T_{avg} at RTP, ≤ 575.4°F.

$K_4 \le 1.06$

$K_5 \ge 0.02/°F$ for increasing T_{avg}
0/°F for decreasing T_{avg}

$K_6 \ge 0.00277/°F$ when T > T'
0/°F when T ≤ T'

$\tau_3 \ge 9$ sec

f(ΔI) = as defined in Note 1 for Overtemperature ΔT

70. Given the following plant conditions:

- Mode 1 at 100% RTP
- The daytime temperature is 105°F, CV pressure reads 0.2 psig
- The predicted night time low is 55°F with a high pressure area.

Which ONE (1) of the following describes the expected response of CV pressure **and** applicable required actions?

A. Increase, no actions required.

B. Increase, open CV vacuum reief valves.

C. Decrease, open CV vacuum relief valves.

D. Decrease, verify CV vacuum valves open automatically.

71. Given the following plant conditions:

- Waste Holdup Tank (WHUT) level is increasing faster than normal
- Auxiliary Building Sump pumps "C" and "D" have been operating more frequently than normal

Which ONE (1) of the following describes a plant condition that, **without operator action**, would cause the above?

A. A leak in the SFP liner.

B. A leak from RHR pump "A" seal.

C. SFPC-805B, RWST RETURN, not fully seated, causing the RWST to overflow.

D. A demineralized water leak in the E/RC building.

72. Which ONE (1) of the following will cause a change in the amount of natural circulation cooling?

A. A change in S/G level from 50% NR to 20% NR.

B. A change in S/G level from 75%WR to 40%WR.

C. Go from 45% Pressurizer level to 92% RVLIS Full Range.

D. Go from 70% RVLIS Full Range to 90% RVLIS Full Range.

73. Given the following plant conditions:

- RCS T-cold is 175°F, Pressure is 345 psig
- RHR is aligned for core cooling
- "A" RHR is running, "B" RHR is in standby
- "A" S/G is drained for maintenance
- "C" S/G is drained for maintenance
- It is desired to place "B" RHR pump out of service to conduct maintenance scheduled to take 6 hours

Which ONE (1) of the following describes the condition that must be satisfied in the "B" S/G in order to allow the RHR maintenance without entering an LCO?

Operable with:

A. level at least 10% (NR).

B. level at least 16% (NR).

C. temperature not >50°F higher than RCS T-cold.

D. temperature not >50°F lower than RCS T-cold.

74. Given the following plant conditions:

- Mode 1 at 85% RTP
- LCV-1530A, HDT LEVEL CONTROL VALVE, air supply piping ruptures
- The AO is directed to isolate air to LCV-1530A to stop the leak
- The AO inadvertently isolates air to LCV-1530B, HEATER DRAIN PUMPS SUCTION DUMP TO CONDENSER

Which ONE (1) of the following describes how these valves respond to the above plant conditions ?

A. LCV-1530A closes and LCV-1530B opens.

B. LCV-1530A position does not change and LCV-1530B closes.

C. LCV-1530A opens and LCV-1530B closes.

D. LCV-1530A position does not change and LCV-1530B opens.

75. Given the following plant conditions:

- Mode 1 at 100% RTP
- Vacuum pump "A" is running
- Vacuum pump "B" is selected to AUTO

Which ONE (1) of the following describes the correct operation of the vacuum pumps?

A. At 25.5 inches Hg decreasing, "B" automatically starts and at 27.0 inches Hg increasing, "B" automatically stops.

B. At 25.5 inches Hg decreasing, "B" automatically starts and "B" must be manually stopped and returned to AUTO.

C. All running pumps will shift to "hogging" mode at 25 inches Hg decreasing.

D. All running pumps will shift to "jetting" mode at 27 inches Hg increasing.

76. Given the following plant conditions:

- Mode 1 at 100% RTP
- Breaker 52/20, UAT TO 4160V BUS 4, trips on defect

Which ONE (1) of the following provides a correct plant response?

A. Loss of "A" condensate pump, "A" Feed pump auto trip, manual reactor trip required due to >80% RTP.

B. Automatic reactor trip due to >P-8 and loss of RCP "A".

C. Loss of "B" Feed pump, manual reactor trip not required due to automatic trip from loss of "C" RCP >P-8.

D. Automatic reactor trip due to >P-8 and loss of RCP "B".

77. Which ONE (1) of the following describes the correct location where the sample lines for R-16 (CV HVH COOLING WATER) tie into the Service Water system?

A. Downstream of the HVH unit discharge isolation valves, outside of the CV.

B. Downstream of the HVH unit discharge isolation valves, inside of the CV.

C. Upstream of the HVH unit discharge isolation valves, outside of the CV.

D. Upstream of the HVH unit discharge isolation valves, inside of the CV.

78. Which ONE (1) of the following describes a correct operation of the Motor Driven Fire Pump (MDFP)?

The MDFP :

A. must be manually started from the Control Room when any fire alarm is received.

B. is automatically started whenever Fire Header pressure falls to 115 psig.

C. is automatically started when any fire suppression system is manually actuated.

D. must be manually secured from the Control Room when fire water is no longer required.

79. Given the following plant conditions:

- The Plant is shutdown following a reactor trip and safety injection
- CV pressure during the event peaked at 9 psig and now reads 3 psig
- You are directed by Path 1 to "RESET PHASE A AND PHASE B"

Which ONE (1) of the following describes the indications that you will see on the RTGB when this step is performed?

A. All of the Phase A&B component lights turn from pink to blue.

B. APP-002-D2, CV ISOL PHASE B, extinguishes.

C. APP-002-C2, CV ISOL PHASE A, extinguishes.

D. PCV-1716, INST AIR ISO TO CV, opens.

80. Given the following plant conditions:

- Mode 5
- RHR "B" pump running, system aligned for Core Cooling
- RCS temperature is 185°F
- RCS Pressure is 365 psig
- PT-403, RCS NR Pressure, fails high

Which ONE (1) of the following describes an effect that this has on plant operation?

A. RHR-750 & 751, Pump suctions From Loop #2 Hot Leg, automatically close.

B. RHR-750 & 751, Pump suctions From Loop #2 Hot Leg, cannot be opened if they close.

C. PCV-145, PRESSURE, closes to restore pressure to setpoint.

D. PCV-145, PRESSURE, opens to restore pressure to setpoint.

81. Given the following plant conditions:

- Mode 1 at 100% RTP
- The temperature deviation setpoint for the Steam Dump Control System has been inadvertently set at 50°F during the last maintenance action.
- Rod H-8 drops

Which ONE (1) of the following describes a plant response to the above conditions?

A. The rods will fail to insert in automatic until a 50°F difference exist between Tave and Tref.

B. The steam line PORV's will open on a control signal from the Steam Dump Control System.

C. APP-003-C3, PRT HI PRESS, illuminates.

D. Steam dumps modulate open.

82. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" CCW pump is running
- All equipment is in a normal lineup
- A lightning strike causes a major disruption on the grid
- The turbine trips due to the transient
- All off-site power is lost
- EDG "B" is under clearance

Which ONE (1) of the following describes which CCW pump(s) will be running two minutes after the trip?

A. No CCW pumps running.

B. "B" CCW pump running.

C. "A" CCW pump running.

D. "C" CCW pump running.

83. Which ONE (1) of the following describes the design of the Service Water Booster Pumps?

A. With SI sequencer, will start regardless of suction pressure to maintain Service Water pressure inside CV during a DBALOCA.

B. With SI sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water pressure inside CV during a DBALOCA.

C. With Blackout sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water to at least one CV Air Recirculation unit.

D. With Blackout sequencer, will start regardless of suction pressure to maintain Service Water to at least one CV Air Recirculation unit.

84. Which ONE (1) of the following describes a Grid System Alert condition and what may or may not be performed during this condition?

A. During a System Reliability Alert, delay High Risk surveillances with a frequency of longer than quarterly without including the 25% grace period.

B. During a System Economics Alert, reschedule High Risk quarterly surveillances without including the 25% grace period.

C. During a System Reliability Alert, perform weekly High Risk surveillances as scheduled.

D. During a System Economics Alert, all surveillance testing can be performed as scheduled.

85. Given the following plant conditions:

- You are in AOP-022, LOSS OF SERVICE WATER, SECTION "A"
- You have dispatched an operator to perform step 4
- PI-1684, SOUTH SW HEADER PRESSURE, indicates 37 psig and is stable
- "B" and "C" Circ water pumps are running

Using the attached AOP-022, SECTION "A", which ONE (1) of the following contains the correct actions that you should take in continuing with the procedure?

A. Perform RNO for step 5, go to step 9.

B. Perform steps 5 and 6, wait at step 7 until SW-188 is CLOSED, then go to step 9.

C. Perform RNO for step 5, perform step 6, go to step 9 while SW-188 is being CLOSED.

D. Once step 5 is completed, perform step 6, wait at step 7 until SW-188 is CLOSED, then go to step 8.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 1 of 4)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
1.	Verify The Following Valves - OPEN: • V6-12A, SW SOUTH HDR ISO • V6-12B, SW X-CONN • V6-12C, SW X-CONN	
2.	Perform The Following: a. Monitor SW Header pressure indications on PI-1616 AND PI-1684 b. Close V6-12D, SW NORTH HDR ISO	
3.	Evaluate SW Header Pressure Indications As Follows: • Check South SW Header pressure on PI-1684 - STABLE OR INCREASING • Check North SW Header pressure on PI-1616 - DECREASING	Perform the following: a. Open V6-12D. b. Go To Section B of this procedure.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 2 of 4)

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CAUTION

Confined Space entry requirements must be observed to access the North SW Strainer Pit.

****

NOTE

- SW-188, NORTH HDR SUPPLY TO SCRN WASH & CW PMP GLAND SEAL, is located in the North SW Strainer Pit.
- SW-839 and SW-845, NORTH SW HEADER CHEMICAL INJECTION, are located above the North SW Strainer Pit on the North side.
- Key #91 OR the Security Key is required to acess the SW Strainer Pits.

4. Verify The Following Valves At The Intake Structure - CLOSED:
   - SW-188
   - SW-839
   - SW-845

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 3 of 4)

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED
5.	Check South SW Header Pressure On PI-1684 - BETWEEN 40 PSIG TO 50 PSIG	Perform one or both of the following to restore South SW Header pressure to between 40 psig and 50 psig: • Throttle SW flow from CCW Heat Exchanger A as follows: a. Open SW-271, ROOT VALVE PI-1619A. b. Throttle SW-739, CCW HEAT EXCHANGER "A" RETURN, to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619A. c. Close SW-271. OR • Throttle SW flow from CCW Heat Exchanger B as follows: a. Open SW-260, ROOT VALVE PI-1619B. b. Throttle SW-740, CCW HEAT EXCHANGER "B" RETURN, to establish SW pressure between 40 psig and 50 psig as indicated by PI-1619B. c. Close SW-260.
6.	Check Circulating Water Pump Status - ANY RUNNING	Go To Step 9.
* 7.	Check SW-188 - CLOSED	WHEN SW-188 is closed, THEN perform Step 8. Go To Step 9.

STEP	INSTRUCTIONS	RESPONSE NOT OBTAINED

SECTION A

LOSS OF NORTH SERVICE WATER HEADER UPSTREAM OF CHECK VALVE SW-541

(Page 4 of 4)

8.	Determine If Adequate Seal Water Is Available To Circulating Water Pumps As Follows: • APP-008-E4, CW PMP A SEAL WTR LOST - EXTINGUISHED AND • APP-008-E5, CW PMP B SEAL WTR LOST - EXTINGUISHED AND • APP-008-E6, CW PMP C SEAL WTR LOST - EXTINGUISHED	Perform Attachment 5 while continuing with this procedure.
9.	Perform The Following: a. Inspect the area of the leak b. Report findings to the SSO c. Identify and isolate the source of the SW leak	
10.	Refer To Technical Specifications For Any Applicable LCOs	
11.	Implement The EALs	
12.	Return To Procedure And Step In Effect	

- END -

86. Which ONE (1) of the following plant conditions satisfies the requirements for both administrative controls and technical specifications of Mode 2?

A. SDB "B" @ 30 steps, Keff >0.985.

B. SDB "B" @ 30 steps, Keff >0.995.

C. SDB "A" @ 30 steps, Keff >0.985.

D. SDB "A" @ 30 steps, Keff >0.995.

87. Given the following plant conditions:

- Mode 2
- Reactor startup in progress IAW GP-003, NORMAL PLANT STARTUP FROM HOT SHUTDOWN TO CRITICAL
- The reactor is stable, Keff<1
- Stable power levels are:
    - Highest SR=22,000 cps
    - Highest IR=1.8×10^{-11} amps
- Rod positions are:
    - Control Bank "C" @ 202 steps
    - Control Bank "D" @ 74 steps

Using the ATTACHMENT 6.2 provided, which ONE (1) of the following provides the lowest projected criticial position?

Control Bank "D" at:

A. 92 steps (SR)

B. 114 steps (IR)

C. 220 steps (SR)

D. 218 steps (IR)

INVERSE COUNT RATE RATIO (1/M) DATA AND PLOT FORM

1. Log 1/M data as it is acquired following rod withdrawal in Table 1.

2. Plot the reference count rate (CR_o) versus Control Rod Bank and Step position on the 1/M Plot Form.

3. **WHEN** CR_1 data is available, **THEN** divide CR_o by CR_1 (CR_0/CR_1=1/M).

4. Plot the results versus Control Rod Bank and Step position on Attachment 6.2, 1/M Plot Form, for Source **AND** Intermediate Ranges.

NOTE: Extrapolations should extend through the X-AXIS at rod positions greater than the ECP and approach the ECP as the second and third points are plotted and extrapolated.

   - Connect the new point with the previous point **AND** extend the line (extrapolate) through the X-AXIS (predicted Critical Rod Position).

   - Log the predicted Critical Rod Position on Table 1 as the LOWEST PROJECTED CRITICAL POSITION.

5. Verify that the Lowest Critical Rod Position is above the Minimum Rod Position for Criticality.

6. Calculate the target count rate for the next doubling by multiplying the current count rate by two and log the result on Table 1.

7. Repeat Steps 3 through 6 for each ECP extrapolation using CR_2 through CR_4 acquired in Section 5.2 in place of CR_1 as shown on Table 1.

INVERSE COUNT RATE RATIO (1/M) DATA AND PLOT FORM

NOTE: The Reactor Operator may shut down the Reactor if the predicted critical rod position from the 1/M plot falls outside the +/-500 pcm positions. (Project 97-00161)

Minimum Insertion Limits: 87 Steps on Bank C / ______ Steps on Bank D

TABLE 1

STEP #	TIME	ROD POS.	NI-32 COUNTS	1/M	NI-35 AMPS	1/M	LOWEST PROJECTED CRITICAL POSITION	LOWEST PROJECTED CRIT. POS. ABOVE MIN INSERTION LIMIT (INIT)	TARGET COUNT RATE
5.2.21	0930		CR_0= 2,000	CR_0/CR_0= 1.0	CR_0= 1.0×10^{-11}	CR_0/CR_0= 1.0			2^*CR_0= 4,000 / 2.0×10^{-11}
5.2.25	0952	80-C	CR_1= 4,200	CR_0/CR_1= 0.48	CR_1= 1.0×10^{-11}	CR_0/CR_1= 1.0	168-D	an	2^*CR_1= 8,400 / 2.0×10^{-11}
5.2.27	1005	52-D	CR_2= 10,000	CR_0/CR_2= 0.20	CR_2= 1.2×10^{-11}	CR_0/CR_2= .83	92-D	an	2^*CR_2= 20,000 / 2.4×10^{-11}
5.2.29			CR_3=	CR_0/CR_3=	CR_3=	CR_0/CR_3=			2^*CR_3=
5.2.32			CR_4=	CR_0/CR_4=	CR_4=	CR_0/CR_4=			

DATE: ______ STARTUP #: ______ 1/M PLOTTER: ____________________

ATTACHMENT 6.2

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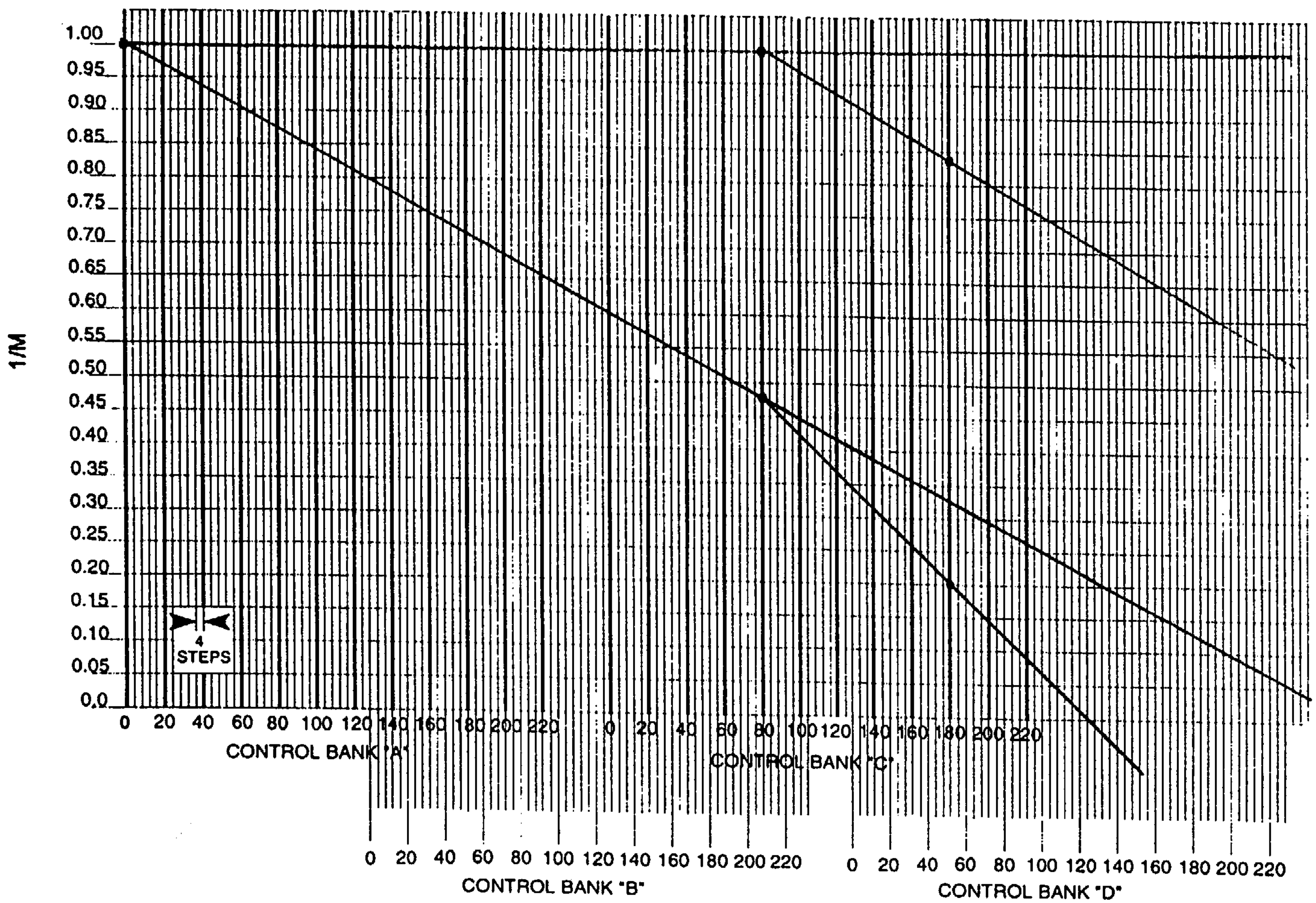
INVERSE COUNT RATE RATIO (1/M) DATA PLOT FORM



88. Given the following plant conditions:

- Mode 3, after a trip that occurred 5 hours ago
- Pre-startup preparations are in progress, criticality scheduled for 8 hours from now
- Reactor trip breakers are open
- An Estimated Critical Condition has been prepared for the startup
- ECC RCS boron is 670 ppm
- Mode 3 SDM is 720 ppm
- Present RCS boron concentration is 680 ppm

Which ONE (1) of the following describes the required action to take to adjust RCS boron concentration?

A. Borate to 720 ppm, then withdraw SD Bank "A"

B. Withdraw SD Bank "A", then borate to 720 ppm

C. Dilute to 670 ppm, then withdraw SD Bank "A"

D. Withdraw SD Bank "A" then dilute to 670 ppm

89. Which ONE (1) of the following describes a correct action for making a boundary change on a clearance?

A. All work activities within the scope of the clearance shall be suspended for all boundary changes.

B. Must notify clearance holders (or designated alternate if off-site) for all boundary changes.

C. Temporary Tag Lifts should be restored within the shift that they were lifted.

D. If the clearance holder is not on site, can make the changes but must notify the clearance holder as soon as practical.

90. Given the following conditions:

- MODE 6, the Reactor Vessel Head is detensioned
- The SFP Gate Valve is closed
- The Reactor Vessel Head lift/removal is scheduled to commence in one hour. All required prerequisites/conditions are satisfied
- The Outage Shift Manager wants to allow planned maintenance on breaker MCC-6 / CMPT 2FL, FEED TO INSTRUMENT BUS 4, requiring IB-4 to be transferred to its alternate supply within the next 30 minutes

Which ONE (1) of the following correctly describes how **and** why this maintenance action impacts the scheduled Reactor Vessel Head lift ? (Refer to Attached OMP-003, Attachment 10.2)

A. No impact, can be lifted as scheduled. Alternate power supply for IB-4 is acceptable.

B. No impact, can be lifted as scheduled. Normal power supply for N31 or N32 is available.

C. Prohibits the lift. Inadequate PZR level instrumentation.

D. Prohibits the lift. Inadequate RCS temperature indication.

SHUTDOWN SAFETY FUNCTION REQUIREMENTS

Mode 5 and Mode 6: Cavity <23′ 6″ and Upper Internals Installed (Fuel in CV)					
Decay Heat Removal	**Electrical Power**	**Inventory Control**	**Reactivity Control**	**RCS Pressure Control**	**CV Status**
– 2-RHR trains OP (1) – 2-SW pumps AV (2) – 1-SW header AV – 2-CCW pumps AV (2) – 1-CCW HX AV – 2-RCS/RHR TI AV (3,16) – 1-HVH unit AV (4) – 1-SWBP AV (4) **AND** <u>When RCS intact</u> (natural circulation) – 1-SG OP (5) – Operable SG PORV AV – 1-MDAFWP AV (4,6) – CST AV (7) – 1-bank of PZR heaters AV	– 1-offsite source OP (8) – 1-EDG OP (12) – 2-AC trains OP – 2-DC trains OP	– 1-SI pump and RWST AV (9,11,17) – 1-Chg. pump with suction from RWST or blended makeup AV (10,11,17) – RCS LI AV (14)	– RWST AV (11) – "A" BAT AV (11) or – "B" BAT AV (11) <u>NIS</u> Mode 5 – N31 or N32 OP (16) Mode 6 – N31 and N32 OP (16)	<u>RCS pressurized</u> – LTOP OP **OR** <u>RCS not pressurized</u> – 2-PZR PORV (15) (blocked open) **or** – 1-PZR safety (removed) **or** – 1-SG primary manway (open) **or** – PZR manway (open) **or** – RV head (off)	– OMM-033 (13)

Footnotes: **Note:** Deviations from these requirements are allowed if the condition is covered by an ITS Action Statement and the Action Statement is entered or if condition is covered by an approved Contingency Plan.

(1) CV sump recirculation flow paths are not required during normal Mode 5, Mode 6, and defueled conditions (see Step 8.1.1.5).
(2) One pump/flow path with normal and emergency power aligned to operable power train. Second pump/flow path with only one power source available.
(3) ICCM indication (1 per core quadrant) and RCS/RHR temperature indication (e.g. TR-604, powered from IB-4). ICCM indication not required when disabled by EST-087. Additional temperature indication is required when at reduced inventory and lower RCS levels (see GP-008).
(4) Component and flowpath with normal and emergency power available. OP-101 requires two HVH units in service when RCPs are operating (motor cooling).
(5) Secondary side water level ≥16%
(6) With available flow path from CST to operable SG
(7) CST volume ≥35,000 gals.
(8) Backfeed only for SUT work. Planned switching of off-site sources shall <u>not</u> occur at reduced inventory or lower RCS levels.
(9) SI cold leg injection available when equipment hatch is removed. Either cold leg injection or one hot leg available when equipment hatch is <u>not</u> removed.
(10) Charging cold leg injection (CVC-310B) available when equipment hatch is removed. Either hot leg (CVC-310A) or cold leg injection available when equipment hatch is <u>not</u> removed.
(11) See Steps 8.3.1.3 & 4 for required RWST, BAST, and PWST levels.
(12) At PZR level ≤5% or during cavity filling/full with internals installed, a second EDG should be available. During this time EDG work is minimized.
(13) Status per ITS 3.9.3 is required during core alterations and irradiated fuel movement in the CV.
(14) LI-462 (powered from IB-4) available at PZR level >10%. LI-403 (powered from E-2-MCC-18-PP-62) and LI-404 (powered from E-2-MCC-18-PP-60) available at PZR level <5%. GP-008/009 controls transition from LI-462 to standpipe indication.
(15) With RC-535 and RC-536 open and motors de-energized.
(16) Normal IB-4 power supply (MCC-6) or alternate supply (MMC-8) is acceptable.
(17) SI or Charging pump/flow path with normal and emergency power aligned to operable power train. Other pump/flow path with only one power source available.

SHUTDOWN SAFETY FUNCTION REQUIREMENTS

Mode 6: Upper Internals Removed with SFP Gate Valve Closed (Fuel in CV)					
Decay Heat Removal	Electrical Power	Inventory Control	Reactivity Control	RCS Pressure Control	CV Status
– Refueling cavity flooded – 1-RHR train OP (1,2) – 2-SW pumps AV (3) – 1-SW header AV – 1-CCW pump AV (4) – 1-CCW HX AV – 1-RCS/RHR TI AV (5, 13)	– 1-offsite source OP (6) – 1-EDG OP – 2-AC train OP (11) – 2-DC train OP (11)	– 1-SI pump AV (4,7) – RWST AV (8) **OR** – 1-Chg. pump AV (4,9) – RWST AV (8) or blended M/U to chg. pump suction AV (8)	– manual addition of boric acid FUN – RWST AV (8) or – "A" BAT AV (8) or – "B" BAT AV (8) <u>NIS</u> – (N31 and N32) OP (12, 13)	– RV head (off)	– per ITS 3.9.3 (10)

Footnotes: **Note:** Deviations from these requirements are allowed if the condition is covered by an ITS Action Statement and the Action Statement is entered or if condition is covered by an approved Contingency Plan.

(1) CV sump recirculation flow paths are not required during normal Mode 5, Mode 6, and defueled conditions (see Step 8.1.1.3).
(2) Pump and flowpath with normal OR emergency power operable. Pump must be aligned to an operable power train.
(3) One pump/flow path with normal and emergency power aligned to operable power train. Second pump/flow path with only one power source available.
(4) Pump/flow path with normal and emergency power aligned to operable power train.
(5) Temperature indication must be in the control room (e.g. TR-604, powered from IB-4).
(6) Backfeed only for SUT work.
(7) Either cold leg injection or one hot leg flow path available.
(8) See Step 8.3.2.3 for required RWST, BAST, and PWST levels. Blended makeup to RWST and charging pumps may be taken out-of-service but unavailable time should be kept to a minimum.
(9) Either hot leg (CVC-310A) or cold leg injection (CVC-310B) available.
(10) Per OMM-033 requirements when core alterations or fuel movement are <u>not</u> occurring.
(11) One train is allowed if "A" train is operable, ITS LCO 3.7.9 Required Actions are entered during fuel movement, and source range detector audio indication powered from MCC-8. Operable train must support the operable RHR pump.
(12) Visual indication for N31/N32 powered from IB-1/IB-2. Audio indication for both powered from IB-4.
(13) Normal IB-4 power supply (MCC-6) or alternate supply (MMC-8) is acceptable.

SHUTDOWN SAFETY FUNCTION REQUIREMENTS

Mode 6: Upper Internals Removed with SFP Gate Valve Open (Offload/Reload)					
Decay Heat Removal	Electrical Power	Inventory Control	Reactivity Control	RCS Pressure Control	CV Status
RCS/Cavity – Refueling cavity flooded – 1-RHR train OP (1,2) – 1-RCS/RHR TI AV (3, 16) SFP – 2-SFPC pumps AV (4) – SFP HX. AV – Firewater to SFP HX. FUN – 1-SFP temp. Annun. FUN(3) RCS/Cavity and SFP – 2-SW pumps AV (14) – 1-SW header AV – 1-CCW pump AV (2) – 1-CCW HX AV	– 1-offsite source OP (6) – 1-EDG OP – 2-AC trains OP (13) – 2-DC trains OP (13) – DSDG (including DS to 480V Bus 3) AV (11)	RCS/Cavity – 1-SI pump AV (5,7) – RWST AV (7) **OR** – 1-Chg. pump AV (5,9) – RWST AV (8) or blended M/U to chg. pump suction AV (8) SFP – SFP level annun. FUN (12) – RWST AV or – Demin. wtr. AV	RCS/Cavity – manual addition of boric acid FUN – RWST AV (8) **or** – "A" BAT AV (8) **or** – "B" BAT AV (8) NIS – (N31 and N32) OP (15,16) SFP – RWST AV **or** – manual addition of boric acid FUN	– RV head (off)	– per ITS 3.9.3 (10)

Footnotes: **Note:** Deviations from these requirements are allowed if the condition is covered by an ITS Action Statement and the Action Statement is entered or if condition is covered by an approved Contingency Plan.

(1) CV sump recirculation flow paths are not required during normal Mode 5, Mode 6, and defueled conditio ns (see Step 8.1.1.3).
(2) With operable normal OR emergency power aligned to operable power train.
(3) Control room RCS/RHR temperature indication (such as TR-604, powered from IB-4). SFP high/low temperature annunciator (APP-036-B4, powered by IB-1).
(4) One pump/flow path with normal and emergency power supply available (EDG or DSDG). Second pump/flow path with only one power source available.
(5) Pump/flow path with normal and emergency power aligned to operable power train.
(6) Backfeed only for SUT work. Planned switching of off-site sources shall not occur during core alterations or fuel movement.
(7) Either cold leg injection or one hot leg flow path (SI-866A or 866B) available.
(8) See Step 8.3.2.3 for required RWST, BAST, and PWST levels. Blended makeup to RWST and charging pumps may be taken out-of-service but unavailable time should be kept to a minimum.
(9) Either hot leg (CVC-310A) or cold leg injection (CVC-310B) available.
(10) Per OMM-033 when core components are not being moved.
(11) Only when the DSDG is used as an emergency power source for a required SSF component.
(12) SFP low level annunciator (APP-036-B6, powered by IB-2)
(13) One train is allowed if "A" train is operable, ITS LCO 3.7.9 Required Actions are entered during fuel movement, and source range detector audio indication powered from MCC-8. Operable train must support the operable RHR pump.
(14) One pump/flow path with normal and emergency power aligned to operable power train. Second pump/flow path with only one powe r source available.
(15) Visual indication for N31/N32 powered from IB-1/IB-2. Audio indication for both powered from IB-4.
(16) Normal IB-4 power supply (MCC-6) or alternate supply (MMC-8) is acceptable.

SHUTDOWN SAFETY FUNCTION REQUIREMENTS

Defueled: SFP Gate Valve Closed (Core in SFP)					
Decay Heat Removal	Electrical Power	Inventory Control	Reactivity Control	RCS Pressure Control	CV Status
– 2-SFPC pumps AV (1) – SFP HX. AV – 2-SW pumps AV (1,8) – 1-SW header AV (8) – – 2-CCW pumps FUN (1) – 1-CCW HX FUN – – Firewater to SFP HX. FUN – – 1-SFP temp. Annun. FUN(2)	– 1-offsite source OP (3) – 1-EDG OP (4) – 1-emergency power supply for SFP cooling AV (7) **AND** – 2-AC trains OP (5) – 2-DC trains OP (5)	– SFP level annun. FUN (6) – RWST AV **or** – Demin. water AV	– RWST AV **OR** – manual addition of boric acid FUN	– 2-PZR PORV (9) (blocked open) **or** – 1-PZR safety (removed) **or** – 1-SG primary manway (open) **or** – PZR manway (open) **or** – RV head (off)	– per OMM-033

Footnotes: **Note:** Deviations from these requirements are allowed if the condition is covered by an ITS Action Statement and the Action Statement is entered or if condition is covered by an approved Contingency Plan.

(1) One pump/flow path with available normal and emergency power supply. Second pump/flow path with only one power source available.
(2) SFP high/low temperature annunciator (APP-036-B4, powered by IB-1)
(3) Offsite source may be Available when irradiated fuel movement is <u>not</u> occurring. Backfeed only for SUT work. Planned switching of offsite sources shall <u>not</u> occur while moving irradiated fuel assemblies in the SFP.
(4) Only during irradiated fuel movement. When required operable, support equipment must be on the same train as the EDG.
(5) During irradiated fuel movement in the SFP, train operability shall be as follows:
- both trains shall be operable **<u>or</u>**
- one train shall be operable and ITS LCO 3.7.9 Required Actions are entered

When not moving irradiated fuel in SFP, "A" train shall be available if emergency power for SFP cooling is supplied by "A" EDG.
"A" or "B" trains are not required when:
- the DS bus supplies emergency power for SFP cooling **<u>and</u>**
- no irradiated fuel movement is occurring

(6) SFP low level annunciator (APP-036-B6, powered by IB-2)
(7) "A" EDG or DSDG shall be available. Availability requirement is met by "A" EDG if "A" is the operable EDG during irradiated fuel movement.
(8) Pumps/header may be functional when irradiated fuel movement is <u>not</u> occurring.
(9) With RC-535 and RC-536 open and motors de-energized

91. Given the following plant conditions:

- Mode 1 at 100% RTP
- A Pressurizer PORV failure has occurred
- RCS pressure reached 2000 psig during the fault and is increasing after operator actions
- RCS temperature is Tref +2°F
- Rods are in manual

Which ONE (1) of the following describes the correct evaluation of plant conditions **and** required actions with regards to core safety limits? [SAFETY LIMITS ATTACHED]

A. Violated SL 2.1.1. Must restore compliance and be in Mode 3 within one hour.

B. Always complied with SL 2.1.1. No actions required per safety limits.

C. Violated SL 2.1.1. Must restore compliance within one hour or be in Mode 3.

D. SL 2.1.1 is not applicable during transients. No actions required per safety limit.

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

In MODES 1 and 2, the combination of THERMAL POWER, Reactor Coolant System (RCS) highest cold leg temperature, and pressurizer pressure shall not exceed the SLs specified in Figure 2.1.1-1.

2.1.2 RCS Pressure SL

In MODES 1, 2, 3, 4, and 5, the RCS pressure shall be maintained ≤ 2735 psig.

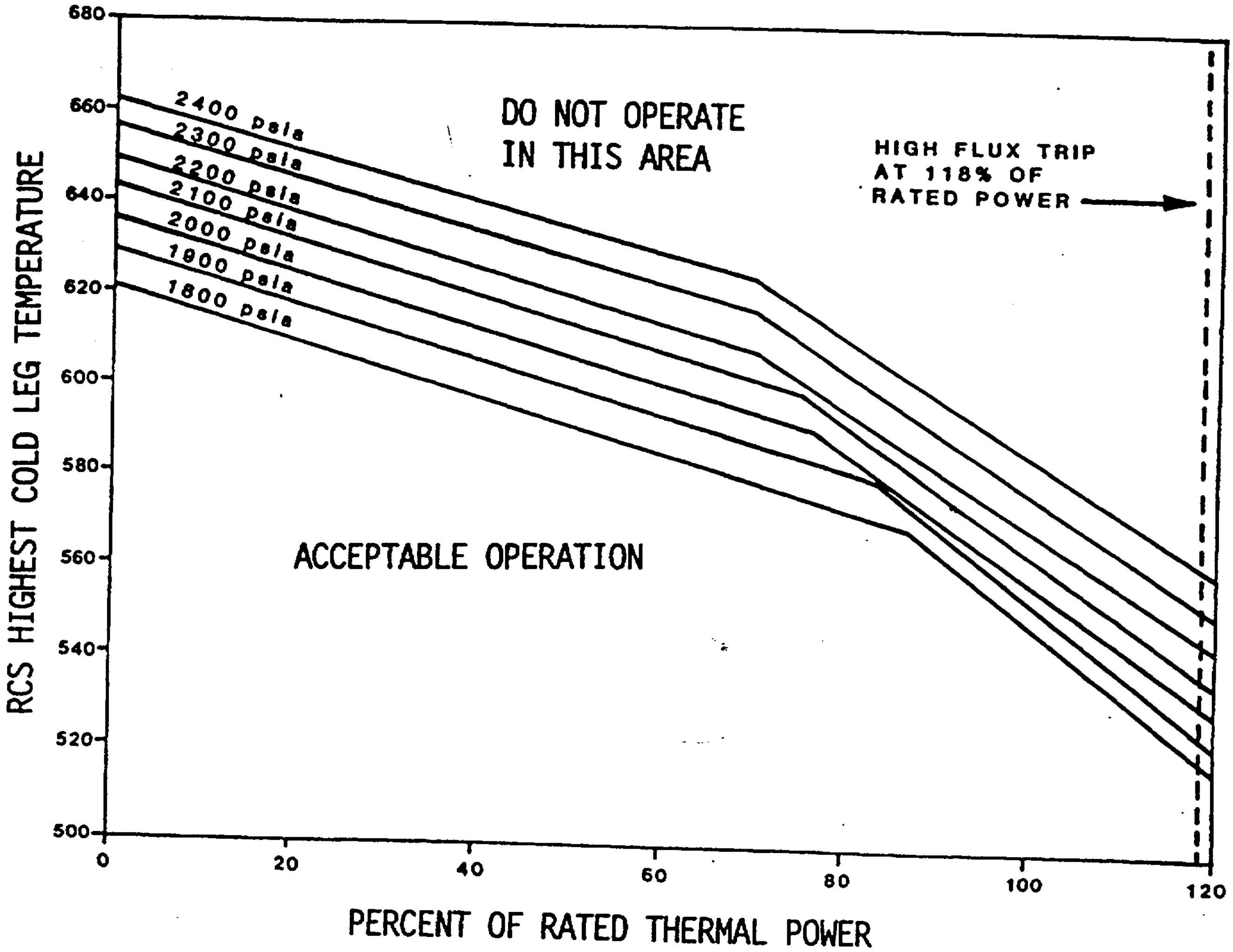
2.2 SL Violations

2.2.1 If SL 2.1.1 is violated, restore compliance and be in MODE 3 within 1 hour.

2.2.2 If SL 2.1.2 is violated:

2.2.2.1 In MODE 1 or 2, restore compliance and be in MODE 3 within 1 hour.

2.2.2.2 In MODE 3, 4, or 5, restore compliance within 5 minutes.



NOTE: BASED ON A MINIMUM RCS FLOW OF 97.3×10^6 lbm/hr

Figure 2.1.1-1 (page 1 of 1)
Reactor Core Safety Limits

92. Given the following plant conditions:

- Mode 1 at 100% RTP
- You have been directed to enter Containment to perform a task
- Your RWP states that your EPD dose alarm will be set at 80 mrem and your rate alarm will be set at 160 mrem/hr
- As you log-in using the Automated Access Control System, the computer screen warns you that RIMS is not operational

Which ONE (1) of the following describes the settings for your EPD dose and rate alarms **and** what is the appropriate response to a Dose alarm while you are performing the task?

A. Dose- 50mrem; Rate 100 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

B. Dose- 50mrem; Rate 100 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

C. Dose- 40mrem; Rate 80 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

D. Dose- 40mrem; Rate 80 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

93. Given the following conditions:

- Mode 1 at 100% when a LBLOCA occurred
- A General Emergency has been in effect for 6 hours
- CV radiation levels have stabilized at 800 R/hour
- A large leak develops at FE-605, RHR Flow Element
- An Emergency Repair Team is assembled to enter Pipe Alley and stop the leak
- The Radiation Control Director reports expected dose will be 30 Rem thyroid committed dose (CDE) for each team member

Which ONE (1) of the following best describes the requirements for administration of Potassium Iodide?

Potassium Iodide shall be administered to consenting repair team members:

A. only if they are older than 45 years of age, prior to entry into the Pipe Alley.

B. only if they are older than 45 years of age, within 24 hours of entry into the Pipe Alley.

C. regardless of age, prior to entry into the Pipe Alley.

D. regardless of age, within 24 hours of entry into the Pipe Alley.

94. Given the following plant conditions:

- Mode 6
- A CV purge is being established per OP-921, CONTAINMENT AIR HANDLING
- The Containment Personnel Airlock Doors will not remain open throughout the purge

Which ONE (1) of the following describes the effect this will have on the Auxiliary Building?

The Auxiliary building will:

A. pressurize unless HVS-1, Auxiliary Building Supply Fan, is running.

B. pressurize unless HVS-1, Auxiliary Building Supply Fan, is secured.

C. depressurize unless HVS-1, Auxiliary Building Supply Fan, is running.

D. depressurize unless HVS-1, Auxiliary Building Supply Fan, is secured.

95. Given the following plant conditions:

- Mode 5
- RCS pressure is 330 psig
- Chemistry has just added H_2O_2 (Hydrogen Peroxide) to the RCS

Which ONE (1) of the following describes an effect this chemical addition will have on the plant?

A. Radiaton levels will initially decrease in the letdown line.

B. The H_2O_2 will convert to water because RCS temperature is >200 degrees.

C. Cummulative exposure during the refueling will be reduced.

D. A sufficient hydrogen inventory will exist to scavenge oxygen.

96. Which ONE (1) of the following contains indications that all lead to entry into FRP-C.1, RESPONSE TO INADEQUATE CORE COOLING?

A. 2 RCP's running, CET's 705°F, RVLIS dynamic head 36%.

B. 1 RCP running, CET's 1135°F, RVLIS dynamic head 20%.

C. CET's 585°F, RVLIS full range 31%.

D. CET's 705°F, RVLIS full range 36%.

97. Given the following conditions:

- MODE 1, 100% RTP
- APP-001-B5, RCP HIGH VIB alarm
- The crew entered the appropriate abnormal operating procedure to address the RCP situation
- Moments later, APP-002-F7, INST AIR HDR LO PRESS alarms
- The RO reports IA Header pressure is 62 psig and decreasing
- The CRSS observes APP-004-C5, S/G C LO LVL & STM > FWF TRIP
- The RO attempts a manual reactor trip from both pushbuttons without success

Which ONE (1) of the following describes the proper crew actions?

Perform and verify the immediate actions of FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS, and then:

A. trip the affected RCP IAW AOP-018, RCP ABNORMAL CONDITIONS while continuing with FRP-S.1.

B. continue actions in AOP-018, RCP ABNORMAL CONDITIONS while continuing with FRP-S.1.

C. implement AOP-017, LOSS OF INSTRUMENT AIR, while continuing with FRP-S.1.

D. complete FRP-S.1 before addressing either condition.

98. During EPP-6, NATURAL CIRCULATION COOLDOWN WITH A STEAM VOID IN THE VESSEL, you are directed to establish Pressurizer level between 20-25%. Which ONE (1) of the following states the correct reason for establishing this Pressurizer level?

This level is established prior to cooldown in order to:

A. provide additional static head to enhance natural circulation.

B. ensure letdown flow is not disrupted.

C. ensure the accommodation of void growth.

D. provide a method to monitor void growth.

99. Given the following plant conditions:

- The Unit is in FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
- All immediate actions have been performed
- Emergency boration is in progress
- AFW is in operation, all S/G's are 8% (NR)
- RCS pressure is 2300 psig

Which ONE (1) of the following desribes the feed flow requirement **and** the basis for it?

A. AFW flow at least 300 gpm to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

B. AFW flow at least 600 gpm to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

C. FW bypass flow >0.2 x 10^6 pph to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

D. FW bypass flow >0.4 x 10^6 pph to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

100. Given the following conditions:

- Mode 1 at 30% RTP
- An Unusual Event was declared 10 minutes ago due to an extended fire inside the protected area
- The fire has been extinguished and the plant stabilized

Which ONE (1) of the following responsibilities must be performed by the Site Emergency Coordinator **and** cannot be delegated?

A. Notifying state and county authorities of emergency classification.

B. Declaring that the emergency has been terminated.

C. Approving press releases prior to issuance.

D. Initiating on site protective actions.

Test Name: 981NRSRO.TST
Test Date: Thursday, June 10, 1999

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	1	AOP	008	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	2	DROPPED ROD GRAPHS	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	3	RODCNTRL	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	4	FRP	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	5	EPP	010	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	6	AOP	012	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	7	EPP-005	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	8	EPP-006	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	9	GP	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	10	FRP-S.1	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	11	EPP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	12	EPP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	13	OMM	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	14	FRP-P.1	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	15	EPP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	16	SD-038	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	17	GP	006	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	18	AOP-024	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	19	AOP	010	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	20	AP	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	21	CV INTEGRITY	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	22	CV	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	23	FRP	004	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	24	ACTIVITY	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	25	EPP-007	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	26	SD	019	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	27	AOP-016	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	28	EPP-009	004	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	29	AOP	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	30	AOP	011	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	31	AOP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	32	NI	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	33	OMM	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	34	PATH-2	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	AOP-010	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	36	FRP-H.1	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	37	ITS	005	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	38	AOP-009	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	39	RMS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	AOP	013	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	41	AOP-025	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	42	EPP-001	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	43	FRP-H.2	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	44	AOP-001	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	TS-3.2.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	46	AOP-014	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	47	SD-021	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	48	SD-003	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	49	SD-006	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	50	SD-002	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B

Test Name: 981NRSRO.TST
Test Date: Thursday, June 10, 1999

						Answer(s)									
		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	51	SD-010	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	52	SD-010	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	53	SD-010	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	54	SD-015	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	55	SD-006	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	56	FRP-H.5	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	57	MFW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	58	AFW	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	59	SD	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	SD	018	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	61	AOP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	62	OMM	005	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	63	GP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	64	AOP	009	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	65	EPP	009	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	66	SD	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	67	OP	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	68	SD	009	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	69	ITS	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	70	SD	011	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	71	SD	012	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	72	EPP	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	73	ITS	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	74	AOP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	75	SD	014	MC-SR	1	B ~~A~~ MF	B	C	D	A	B	C	D	A	B
1:	76	SD	016	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	77	SD	017	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	78	SD	013	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	79	PATH 1	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	80	GP	005	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	81	OP	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	82	SD	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	83	SD	006	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	84	OMM	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	85	OMM	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	86	OMM	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	87	GP	003	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	88	GP	002	MC-SR	1	A ~~B~~ MF	C	D	A	B	C	D	A	B	C
1:	89	PROC	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	90	OMP	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	91	ITS	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	92	10CFR20	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	93	EXPOSURE LIMITS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	94	OP	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	95	GP	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	96	FRP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	97	PROCEDURE NETWORK	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	98	EPP	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	99	FRP	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	100	EP-EMER. COORDINATOR	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C

REGION II
LICENSE EXAMINATION

ADMIN QUESTIONS

RO

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

DISTRIBUTION CODE
A070

RO ADMIN A.1
QUESTION # 1

REFERENCE ALLOWED: __X__ / ______
yes no

Question: Given the following conditions:

- Unit 2 Forced Outage due to excessive vibrations on "C" RCP
- During the previous 7 days you did not exceed any overtime limits
- You have been assigned to work the night shift on the 5th night of your "7-OFF"
- You arrive at work at 1800
- At 0600, while attempting to exit the RCA, it is determined that you are contaminated and require extensive decontamination.
- 2.5 hours later, you are able to leave the RCA and report to the Work Control Center to sign related master copies of the procedures, clearances, etc.
- It takes you 20 minutes to complete all required paperwork, and then you leave the site
- Assume 30 minutes Pre- and Post-Shift Turnovers

When is the earliest you could report to work after working this shift without requiring special permission? (See attached 1999 Shift Schedule, assume you are on Shift 5.)

Answer: **EITHER REQUIRED FOR CREDIT:**

1650 to assume shift duty

OR

1620 to commence shift turnover

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen 2.1.5 2.3 / 3.4

References: PLP-015, Program For Nuclear Power Plant Staff Working Hours, section 4.1.5

RO ADMIN A.1
QUESTION # 2

REFERENCE ALLOWED: __X__ / ______
yes no

Question: Given the following conditions:

- MODE 1, steady state
- No LCOs in effect
- Minimum shift complement is in place
- At 1:30 PM, the RO received an emergency call from home requiring him to depart the site. He is given permission and departs at 1:35 PM.

What are the requirements associated with crew complement and shift relief (including documentation) which must be satisfied?

Answer: [.5] An additional qualified licensed operator shall assume the RO position within 2 hours.
[.5] OMM-001-12, Attachment 6.18, WATCHSTANDER'S MIDDLE-OF-THE-SHIFT TURNOVER SHEET must be completed if the operator did not attend the morning turnover meeting.

[Not required for credit]: Per Technical Specifications, minimum shift complement may be less than required for up to 2 hours due to emergency.

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen. 2.1.4 2.3/3.4

References: 10 CFR 50.54(m)(2)(i)
ITS, section 5.2.2
OMM-001-2,
OMM-001-12, Minimum Equipment List and Shift Relief

RO ADMIN A.1
QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- MODE 1, steady state
- No LCOs in effect
- Minimum shift complement is in place
- At 1:30 PM, the RO received an emergency call from home requiring him to depart the site. He is given permission and departs at 1:35 PM.

What are the requirements associated with crew complement and shift relief (including documentation) which must be satisfied?

RO ADMIN A.1
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question:

Given the following conditions:

- Unit 2 Forced Outage due to excessive vibrations on "C" RCP
- You have been assigned to work the night shift on the 2nd night of your "7-OFF"
- You arrive at work at 1800
- You receive a 30 minute turnover and commence work hanging clearances, etc.
- At 0600, while attempting to exit the RCA, it is determined that you are contaminated and require extensive decontamination.
- 2.5 hours later, you are able to leave the RCA and report to the Work Control Center to sign related master copies of the procedures, clearances, etc.
- It takes you 20 minutes to complete all required paperwork, and then you leave the site

When is the earliest you could report to work after working this shift to fill a 4 hour vacancy without requiring special permission? (See attached 1999 Shift Schedule, assume you are on Shift 5.)

RO ADMIN A.3
QUESTION # 1

REFERENCE ALLOWED: X / ____
yes no

Question: Given the following conditions:

- MODE 1, 100% power
- As a result of a leaking secondary neutron source, Area Radiation Monitor readings in the Auxiliary Building are as follows:
  - ⇒ R-4, Charging Pump Room = 45 mR/hr
  - ⇒ R-9, Letdown Line = 800 mR/hr
- "C" Charging Pump is OOS for pump shaft replacement
- The work activity will take 3 individuals 12 hours to complete
- Doses (CP&L year-to-date) for the individuals are as follows:
  - ⇒ Don … 480 mR
  - ⇒ Dan … 580 mR
  - ⇒ Doug .. 1480 mR

Assuming all three individuals will spend the entire 12 hours in the Charging Pump Room, determine their exposures and any administrative requirements that would have to be satisfied.

Answer: (12 hrs)(45 mR/hr) = 540mR
Don: 540 mR + 480 mR = 1020 mR
Dan: 540 mR + 580 mR = 1120 mR
Doug: 540 mR + 1480 mR = 2020 mR

[.5] CP&L Annual Administrative Exposure limit = 2000 mR
[.5] Site Vice President must approve an extension for Doug

CANDIDATE'S RESPONSE

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Time: 10 min.

K/A Rating: Gen. 2.3.4 2.5/3.1

References: DOS-NGGC-0004, Administrative Dose Limit Changes

RO ADMIN A.3
QUESTION # 2

REFERENCE ALLOWED: __X__ / _____
yes no

Question: Given the following conditions:

- Waste Gas Decay Tank "A" = 50 psig - IN SERVICE
- Waste Gas Decay Tank "B" = 40 psig - COVER
- Waste Gas Decay Tank "C" = 20 psig - STANDBY
- Waste Gas Decay Tank "D" = 80 psig - Being released
- R-14C, PLANT EFFLUENT NOBLE GAS LOW RANGE, alarms moments after the gas release is initiated
- The Inside Auxiliary Operator reports RCV-014, WASTE GAS DECAY TANK RELEASE ISOLATION Valve will not close

What action(s) would you take to terminate this release as soon as possible??

Answer: Close WD-1642D, WGDT "D" INLET

OR

Lock closed WD-1620, WGDT"D" VENT to terminate the Gas Release

Either valve required for credit.

[Not Required for Credit]:
Perform AOP-009, Accidental Waste Gas Release
Determine and correct cause of RCV-014 failure prior to re-commencing the Gas Release

CANDIDATE'S RESPONSE

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Time: 10 min.

K/A Rating: Gen. 2.3.10 2.9/3.3

References: OP-706, Waste Disposal - Gaseous Rad. Waste Release
P&ID 5379-921, sheet 2

RO ADMIN A.3
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- MODE 1, 100% power
- As a result of a leaking secondary neutron source, Area Radiation Monitor readings in the Auxiliary Building are as follows:
  - ⇒ R-4, Charging Pump Room = 45 mR/hr
  - ⇒ R-9, Letdown Line = 800 mR/hr
- "C" Charging Pump is OOS for pump shaft replacement
- The work activity will take 3 individuals 12 hours to complete
- Doses (present quarter) for the individuals are as follows:
  - ⇒ Don ... 480 mR
  - ⇒ Dan ... 580 mR
  - ⇒ Doug .. 1480 mR

Assuming all three individuals will spend the entire 12 hours in the Charging Pump Room, determine their exposures and any administrative requirements that would have to be satisfied.

RO ADMIN A.4
QUESTION # 2

REFERENCE ALLOWED: _____ / __X__
yes no

Question: Given the following conditions:

- Plant shutdown in progress
- A Category 3 hurricane is within 4 hours of the H.B. Robinson Station
- An Alert was declared at 9:22 PM
- Notification to the State and Counties was made at 9:34 PM
- The TSC, OSC, and EOF were activated by 10:10 PM

Explain the process for transferring responsibility for NRC Communications from the Control Room to the Technical Support Center including the time NRC notification is required by.

Answer: [.5] Perform a turnover with the NRC and EOF Communicators. Ensure completion times of the last notification (i.e., the Emergency Notification Form) are available, via fax or electronic means, for the EOF Communications staff.

[.5] 10:22 PM, NRC notification required as soon as possible after State and Counties and not later than 1 hour after declaration of the event.

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen. 2.1.39 3.3/3.1

References: EPNOT-01, CR/EOF Emergency Communicator
EPNOT-04, TSC NRC Emergency Communicator
10 CFR 50.72(a)(3)

REGION II
LICENSE EXAMINATION

ADMIN QUESTIONS

SRO

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

SRO ADMIN A.1
QUESTION # 1

REFERENCE ALLOWED: __X__ / ______
yes no

Question: Given the following conditions:

- MODE 1, 100%
- HCV-121, CHARGING FLOW is bypassed and under clearance for corrective maintenance on the actuator
  - ⇒ CVC-202A, HCV-121 OUTLET closed
  - ⇒ CVC-202B, HCV-121 INLET closed
  - ⇒ CVC-309A, HCV-121 BYPASS open
- LT-460 failed low ~ 20 minutes ago, actions IAW AOP-025 have been taken
- The RO is establishing Letdown IAW OP-301-1 (see attached)

Describe the actions required to satisfy step 8.4.4.1.g of OP-301-1.

Answer: [.33] The RO should identify HIC 121 is bypassed and can not be opened
[.33] The CRSS / SSO determines the step may be marked N/A and initials in the INIT space beside the N/A
[.33] Reason for marking the step N/A & step number noted in the Comments section

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen 2.1.20 4.3/4.2

References: OMM-001-15, section 5.4.3.5

SRO ADMIN A.1
QUESTION # 2

REFERENCE ALLOWED: _____ / __X__
yes no

Question: While independently verifying a valve lineup on "C" Charging Pump, the Inside Auxiliary Operator discovers CVC-267, "C" Charging Pump suction valve is CLOSED instead of OPEN.

What action(s) should be taken?

Answer: When a valve in any plant system is found mispositioned, a full system lineup (including independent verification where applicable) shall be performed IAW the appropriate OP…

[NOT REQUIRED FOR CREDIT]:

…with the following exceptions:

- IF the component was inside a clearance boundary in which maintenance was being performed and it is believed that it became misaligned during that time, THEN only the portion of the OP dealing with the valves inside that clearance boundary need be performed.
- Portions of the system that are known to be properly aligned due to normal system operation or performance of OSTs do not need to have their positions verified IAW the OP.
- Components whose positions can be determined from the RTGB (via switch positions or permissive/status lights) do not need to have their positions verified IAW the OP.
- IF the cause of the mispositioning can be clearly identified, THEN the scope of the lineup can be restricted to those valves subject to the same cause.

If it is believed that the valve was deliberately mispositioned or tampered with, THEN Section 5.3.3 (Operational Response to Deliberate Acts Against Plant Equipment) should be reviewed for applicability.

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen, 2.1.29 3.4/3.3

References: OMM-001-8, step 5.3.2.5.a,b
PLP-030, Independent Verification

SRO ADMIN A.1
QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: ______ / __X__
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: While independently verifying a valve lineup on "C" Charging Pump, the Inside Auxiliary Operator discovers CVC-267, "C" Charging Pump suction valve is CLOSED instead of OPEN.

What action(s) should be taken?

SRO ADMIN A.1
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- MODE 1, 100%
- HCV-121, CHARGING FLOW is bypassed and under clearance for corrective maintenance on the actuator
  - ⇒ CVC-202A, HCV-121 OUTLET closed
  - ⇒ CVC-202B, HCV-121 INLET closed
  - ⇒ CVC-309A, HCV-121 BYPASS open
- LT-460 failed low ~ 20 minutes ago, actions IAW AOP-025 have been taken
- The RO is establishing Letdown IAW OP-301-1 (see attached)

Describe the actions required to satisfy step 8.4.4.1.g of OP-301-1.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Calculate RCS leakage
002*001*R2*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-059 Rev. 4
RO / SRO

K/A Rating(s):

Gen 2.1.20	4.3/4.2
Gen 2.1.23	3.9/4.0

Task Standard:

Calculate RCS leak rate IAW OST-051 within 0.2 gpm.

Preferred Evaluation Location:

Simulator

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation

Validation Time: 15 min. **Time Critical:** No

Candidate: ________________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ____________________________ ____________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 6 Critical because operator action required to prevent leak-by past LCV-115A from invalidating the surveillance
Step 7 Critical because operator must obtain correct data to perform calculation
Step 9 Critical because operator action is required to restore LCV-115A to Auto and obtain correct data to perform calculation
Step 10 Critical because operator must perform the calculations
Step 12 Critical because operator must contact Chemistry personnel due to unidentified leakage>.34 gpm.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-5. Go to RUN, allow plant conditions to stabilize, then place the simulator in FREEZE.
2. Go to RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED RCS Leakage Evaluation:

When I tell you to begin, you are to perform an RCS Leakage Evaluation IAW OST-051. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant is at 100% power.
2. You are the Reactor Operator.

INITIATING CUES:

The CRSS directs you to perform OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation)

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OST-051. **EXAMINER'S CUE: Hand the operator the copy of the procedure after he/she locates it. Inform him/her the revision status has been checked and is current and the SSO's permission to conduct this test has been granted.** COMMENTS:	____ SAT ____ UNSAT
STEP 2: RCS temperature is stable There is a bubble in the Pressurizer (Steps 3.3, 3.4) STANDARD: Operator determines RCS temperature is stable and there is a bubble in the PZR. COMMENTS:	____ SAT ____ UNSAT
STEP 3: RCS pressure is stable Record RCS pressure Record Plant Mode (Step 3.5, 3.6, 3.7) STANDARD: Operator determines RCS pressure is stable at ~ 2235 psig and plant is in Mode 1 COMMENTS:	____ SAT ____ UNSAT
STEP 4: Verify RCS MAKEUP MODE in the AUTO position. (Step 7.1.1) STANDARD: RCS Makeup switch positioned to AUTO. COMMENTS:	____ SAT ____ UNSAT

STEP 5: Verify RCS MAKEUP SYSTEM in the START position. (Step 7.1.2) STANDARD: RCS Makeup System positioned to START as indicated by red indicating light illuminated on the RCS Makeup Control switch. COMMENTS:	____ SAT ____ UNSAT
STEP 6: Place LCV-115A, VCT/HLDP TK DIV in the VCT position. (Step 7.1.3) STANDARD: LCV-115A positioned to VCT as indicated by the white VCT light illuminated on the RTGB. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Whenever possible, use the ERFIS computer for data collection. This will improve accuracy and reduce the potential for human error.
The ERFIS on-screen historic information may be used to assist with data collection. This is especially helpful during a xenon transient or when in AOP-016.

STEP 7: Record the Initial Values for the parameters listed on Attachment 8.1 (Step 7.1.4) STANDARD: Operator obtains / records values and time. (ERFIS should be used for all values except RCS Drain Tank and Charging Pump Leak-off Collection Tank). **EXAMINER NOTE: See attached completed Attachment 8.1.** **BOOTH INSTRUCTOR'S CUE: When requested, report LI-1003 indicates 15%.** **When requested, report LIC-200 indicates 50%.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: IF an automatic makeup occurs, THEN perform the following: (Step 7.1.5.1 & 2) 1. Place LCV-115A, VCT/HLDP TK DIV, in the AUTO position. 2. Stop this procedure AND note reason in Comments section. STANDARD: Operator maintains steady plant conditions for duration of test. COMMENTS:	____ SAT ____ UNSAT

NOTE: When this procedure is being performed to satisfy ITS SR 3.4.13.1, the preferred duration is ≥ 1 hour and the minimum duration is 15 minutes.
When this procedure is being performed as directed by an AOP, there is not a minimum time duration requirement.

EXAMINER'S CUE: **Inform operator that 1 hour has passed and to continue with the test.** **In order to ensure data repeatability for final calculation, CUE the operator with the final values listed below:** • **VCT Level .... 2 inches less than initial value** • **PZR Level .... same as initial value** • **RCS Temp.................. same as initial value** • **PZR RELIEF TANK .....same as initial value** • **Accumulators A, B, C ....same as initial value** • **LI-1003: when operator calls Inside AO, report 17%.** • **LIC-200: when operator calls Inside AO, report same as initial value** STEP 9: WHEN at least 1 hour has elapsed, OR, IF required by Plant conditions to end this test, THEN perform the following: (Step 7.1.6.1., 2 & 3) 1. Verify RCS temperature is equal to initial RCS temperature recorded on Attachment 8.1. 2. Record the Final Values for the parameters listed on Attachment 8.1. 3. Place LCV-115A, VCT HLDP TK DIV, in the AUTO position. STANDARD: 1. RCS temperature verified equal to initial reading. 2. Final values recorded on Attachment 8.1 3. LCV-115A positioned to Auto as indicated by the white AUTO light light illuminated above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: A decrease in VCT level represents plus (+) RCS leakage.
A decrease in Pressurizer level represents plus (+) RCS leakage.

STEP 10: Calculate the Difference and Change In Volume for the parameters listed on Attachment 8.1 (Step 7.1.7) STANDARD: Operator completes the Difference and Change In Volume calculations as directed on Attachment 8.1 **EXAMINER NOTE: See attached completed Attachment 8.1.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: A plus (+) calculated Total RCS Leakage Rate represents plus (+) RCS leakage.

STEP 11: On Attachment 8.2, perform the following: (Step 7.1.8.1., 2., & 3) 1. Calculate the Total RCS Leakage Rate 2. Calculate the Identified RCS Leakage Rate. 3. Calculate the Unidentified RCS Leakage Rate. STANDARD: Operator completes the Total, Identified and Unidentified leakage calculations as directed on Attachment 8.2. **EXAMINER NOTE: See attached completed Attachment 8.2.** COMMENTS:	____ SAT ____ UNSAT
STEP 12: IF RCS unidentified leakage is ≥ .34 gpm, THEN contact E&C Technician to perform Primary to Secondary Leakage Calculation for each steam generator IAW CP-014. [ITS LCO 3.4.13.e] (Step 7.1.9) STANDARD: Operator determines unidentified RCS leakage > .34 gpm and contacts E&C Technician. **BOOTH INSTRUCTOR CUE: If called, respond as the E&C Technician and acknowledge request to perform Primary to Secondary Leakage Calculation IAW CP-014.** **EXAMINER NOTE: See attached completed Attachment 8.2.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 13:	If unidentified RCS leakage is ≥ 1 gpm OR the identified RCS leakage is > 10 gpm, THEN perform the following: (Step 7.1.10.1., 2., 3., & 4) 1. Consult ITS LCO 3.4.13 for required actions. 2. Consult AP-030 for reporting requirements. 3. Consult EPCLA-00 for emergency action levels. 4. Consult AOP-016 for required actions.	____ SAT ____ UNSAT
STANDARD:	Operator determines unidentified RCS leakage < 1 gpm and identified RCS leakage < 10 gpm. Actions 7.1.10.1 thru 4 marked N/A.	

EXAMINER'S CUE: If asked, this surveillance was scheduled for performance.

EXAMINER NOTE:
SURVEILLANCE TEST PROCEDURE CERTIFICATION AND REVIEW FORM:
The operator should circle "Scheduled"
Complete the "Test Performed By:" and "Test Complete" sections.
Test Satisfactory should be circled "YES"

COMMENTS:

END OF TASK

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the actions of the Emergency Communicator IAW EPNOT01 and EPCLA01
085*004*R1*04

Alternate Path:

N/A

Facility JPM #:

JPM ADM-006 Rev. 0
RO / SRO

K/A Rating(s):

2.4.38 2.2/4.0
2.4.43 2.8/3.5

Task Standard:

Emergency Notification Form completed within 13 minutes (see attached completed form)

Preferred Evaluation Location:

Simulator

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EPNOT-01, CR/EOF Emergency Communicator

Validation Time: 10 min. **Time Critical:** YES (13 minutes)

Candidate: ____________________________
NAME

	Overall Time	Critical Time
Start:	________	________
Finish:	________	________
Performance Time (min):	________	________

Examiner: ____________________ ____________________ / ________
NAME SIGNATURE DATE

COMMENTS

Time Critical because notification to the State and County agencies is required within 15 minutes of event classification[1]

Step 3
Critical because operator must log on to EDS using a SSO / CRSS position

Step 4
Critical because an event must be declared in EDS for the first notification

Step 5
Critical because the operator must fill out the electronic form

Step 7
Critical because SEC approval must be obtained and the form electronically faxed to offsite agencies

Step 8
Critical because the operator must make contact with the offsite agencies

Step 11
Critical because operator must document first voice contact with offsite agencies to satisfy 15 minute time requirement

[1] 10 CFR 50 Appendix E, (IV)(D)(3)

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-223 (from IC-5)
2. Place the simulator in RUN long enough to set up the SSO ERFIS Monitor "SPTOP", then back to FREEZE
3. Update the Control Room Status Board to IC-5 Chemistry Sheet.
4. Place the simulator in RUN when directed by the examiner.

Tools/Equipment/Procedures Needed:

EPNOT-01, CR/EOF Emergency Communicator

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Event Notification:

When I tell you to begin, you are to perform the actions of the Control Room Emergency Communicator up to and including contacting State and County agencies. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant was at 100%
2. 10 minutes ago, a SBLOCA occurred which caused a reactor trip and SI actuation
3. The SSO declared a Site Area Emergency based on RCS leakage > Charging capability 2 minutes ago at ________.

INITIATING CUES:

1. You have been directed to perform the duties of the Emergency Communicator up to and including contacting State and County agencies.
2. The crew is responding to the event.

START TIME: ___________ **TIME CRITICAL START TIME:** _______

TEP 1:	Staff the Emergency Communicator function as follows: (Step 8.1.3.1) a. Control Room – 1 Emergency Communicator – 1 SPDS Communicator if ERFIS OOS or as desired	____ SAT
STANDARD:	Operator staffs the Control Room Emergency Communicator position as stated in the Initiating Cue.	____ UNSAT
COMMENTS:		
STEP 2:	If the Electronic Display System (EDS) is not operable: (Step 8.1.3.2) a. Complete emergency notification forms manually and fax forms using a stand alone fax machine.	____ SAT
STANDARD:	Operator determines EDS is operable	
COMMENTS:		____ UNSAT
'EP 3:	If EDS is operable, log on to the system. (Step 8.1.3.3) a. Control Room staff should use the Superintendent Shift Operations (SSO) position login for appropriate access to forms and approval authority.	**CRITICAL STEP**
STANDARD:	Operator logs on to EDS F3 → EP Functions → Login (SSO and name)	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	For first notification only, declare an event on EDS. (Step 8.1.3.4)	**CRITICAL STEP**
STANDARD:	Operator declares an event on EDS	____ SAT
COMMENTS:		____ UNSAT

STEP 5: Complete the Emergency Notification Form. (Step 8.1.3.5) a. Instructions for completing the manual form are included as an Attachment 8.1.5.1 to this procedure. b. For electronic forms, avoid placing the cursor in the approval section of the form prior to actual approval of the form. Premature approval will not allow any SEC/ERM comments to be incorporated without clearing the entire form. STANDARD: a. Operator determines EDS is operable, manual instructions not required. b. Operator avoids placing the cursor in the approval section of the electronic form. **EXAMINER CUE: If asked, Plant conditions are stable. No release has occurred.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 6: If time allows, during SEC/ERM notification form approval, begin working on completing information required to initiate Dialogic. (Step 8.1.3.6) STANDARD: Operator acknowledges that someone else has been assigned to perform Dialogic activation **EXAMINER CUE: Another individual has been assigned Dialogic activation** COMMENTS:	____ SAT ____ UNSAT
STEP 7: Obtain SEC/ERM approval for information on the emergency notification form and fax to offsite agencies. (Step 8.1.3.7) STANDARD: Notification form is faxed to offsite agencies. **EXAMINER'S CUE: Inform the operator SEC approval obtained and direct him/her to approve the notification** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 8:	Transmit notification form to offsite agencies: (Step 8.1.3.8.a) a. Use Selective Signaling System, or – Dial A1 on Selective Signaling phone to simultaneously conference all parties. – The press-to-talk bar must be depressed for other personnel to hear your voice. – The external speaker is active for the first 10 seconds after a call is placed. Any sounds or conversation will be transmitted over the external speaker to offsite phones.	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Operator picks up the Selective Signaling System phone and dials A1	
COMMENTS:		
STEP 9:	Notifications are required within: (Step 8.1.3.8.c) – 15 minutes of an initial classification, or – 30 - 60 minutes for a follow up notification	____ SAT ____ UNSAT
STANDARD:	Operator makes initial notification within 15 minutes	
COMMENTS:		
STEP 10:	Conduct a roll call by agency to determine locations on line. (Step 8.1.3.8.d) – Roll call is to determine that at least one representative from each agency is on line.	____ SAT ____ UNSAT
STANDARD:	Operator determines all State and County agencies are on line by depressing the press-to-talk button and calling for each agency: 1. State of South Carolina 2. Darlington County 3. Lee County 4. Chesterfield County	
BOOTH INSTRUCTOR CUE:	**When called on the Selective Signaling System , respond as follows:** **State of South Carolina Warning Point** **Darlington County Emergency Operations Center** **Lee County Emergency Operations Center** **Chesterfield County Emergency Operations Center**	
COMMENTS:		

STEP 11:	Document time of first voice contact and place a check next to locations contacted (i.e., items 1-4) on page 2 of the Notification Form (Attachment 8.1.5.1). (Step 8.1.3.8.e)	**CRITICAL STEP**
STANDARD:	Operator documents time of 1st voice contact in the appropriate blank and places a check in the following blanks: State of South Carolina Warning Point Darlington County EOC Lee County EOC Chesterfield County EOC	____ SAT ____ UNSAT
COMMENTS:		
	END OF TASK	

TIME CRITICAL STOP TIME: ______________

EMERGENCY NOTIFICATION FORM

MESSAGE NUMBER | 1 |

1. [A] THIS IS A DRILL [Δ] ACTUAL EMERGENCY [Δ] INITIAL [ ] FOLLOW-UP *

2. SITE: H.B. ROBINSON UNIT: 2 REPORTED BY: Art Musselwhite

3. TRANSMITTAL TIME/DATE: ______ (Eastern) ______ mm dd yy CONFIRMATION PHONE NO.: ______

4. AUTHENTICATION (If Required): 0 (Number) ______ (Codeword)

5. EMERGENCY CLASSIFICATION:

[A] NOTIFICATION OF UNUSUAL EVENT [B] ALERT [Δ] SITE AREA EMERGENCY [D] GENERAL EMERGENCY

6. [Δ] EMERGENCY DECLARATION AT [B] TERMINATION AT TIME/DATE: 1118 (Eastern) 05/15/99 mm dd yy (If B go to number 16.)

7. EMERGENCY DESCRIPTION/REMARKS: Site Area Emergency declared based on Reactor Coolant System leak rate greater than Charging pump capacity.

8. PLANT CONDITION: [A] IMPROVING [Δ] STABLE [C] DEGRADING

9. REACTOR STATUS: [Δ] SHUTDOWN TIME/DATE: 1111 (Eastern) 05/15/99 mm dd yy [B] 0.0 % POWER

10. EMERGENCY RELEASE(S): [Δ] NONE (Go to Item 14) [B] POTENTIAL (Go to Item 14)

[C] IS OCCURRING [D] HAS OCCURRED

**11. TYPE OF RELEASE: [A] ELEVATED [B] GROUND LEVEL

[A] AIRBORNE: STARTED ______ (Eastern Time) ______ mm dd yy STOPPED ______ (Eastern Time) ______ mm dd yy

[B] LIQUID: STARTED ______ (Eastern Time) ______ mm dd yy STOPPED ______ (Eastern Time) ______ mm dd yy

**12. RELEASE MAGNITUDE: [ ] CURIES/SEC. [ ] CURIES

NORMAL OPERATING LIMITS: [ ] BELOW [ ] ABOVE

[A] NOBLE GASES ______ [B] IODINES ______

[C] PARTICULATES ______ [D] OTHER ______

**13. ESTIMATE OF PROJECTED OFF-SITE DOSE: [ ] NEW [ ] UNCHANGED

	TEDE mrem	Thyroid CDE mrem
SITE BOUNDARY		
2 MILES		
5 MILES		
10 MILES		

PROJECTION TIME: ______ (Eastern)

ESTIMATED DURATION: 0.0 HRS.

**14. METEOROLOGICAL DATA: [A] WIND DIRECTION (from) 112. [B] SPEED (mph) 16.8

[C] STABILITY CLASS 5 [D] PRECIPITATION (type) 0.00

15. RECOMMENDED PROTECTIVE ACTIONS:

[Δ] NO RECOMMENDED PROTECTIVE ACTIONS [B] EVACUATE ______

[C] SHELTER IN-PLACE ______ [D] OTHER ______

16. APPROVED BY: Art Musselwhite (Name) CRSS (Title) TIME/DATE: 1130 (Eastern) 05/15/99 mm dd yy

If items 8-14 have not changed, only items 1-7 and 15-16 are required to be completed. Information may not be available on initial notifications.

EMERGENCY NOTIFICATION FORM

7. EMERGENCY DESCRIPTION/REMARKS: (continued)

ADDITIONAL REMARKS PART 1.

ADDITIONAL REMARKS PART 2.

GROUP: MET DATA DATE: 05/15/99 TIME: 11:42:49
NAME: WEATHER AND IMPOUNDMENT DATA

POINT ID	DESCRIPTION	VALUE	UNITS	QUAL
EMT0001T	AMBIENT TEMPERATURE	87.0	DEGF	OK
EMT0002S	ELEVATED WIND SPEED (62.3M)	16.8	MPH	OK
EMT0003V	WIND VARIANCE 1	7.2	DEG	OK
EMT0004D	ELEVATED WIND DIR (62.3M) (FROM)	112.6	DEG	OK
EMT0005D	GROUND WIND DIR (11.0M) (FROM)	116.1	DEG	OK
EMT0006V	WIND VARIANCE 2	10.0	DEG	OK
EMT0007S	GROUND WIND SPEED (11.0M)	8.3	MPH	OK
EMT0010T	DIFFERENTIAL TEMP 1	-0.2	DC/M	OK
EMT0011T	DIFFERENTIAL TEMP 2	-2.2	DC/M	OK
EMT0012P	PRECIPITATION (LAST 15 MINUTES)	0.00	INCH	OK
EMT0013P	BAROMETRIC PRESSURE	29.5	INHG	OK
EMT0014S	SOLAR RADIATION	0.9	LANG	OK
EMT0015P	HONEYWELL DEWPOINT	71.5	DEGF	OK
CWT2602A	CONDENSER CW OUTLET TEMP	80.1	DEGF	OK
CWT9019A	UNIT 1 WEST CW INLET TEMP	80.0	DEGF	OK
CWT9020A	UNIT 1 EAST CW INLET TEMP	80.0	DEGF	OK
CWT9021A	BLACK CREEK TEMP	80.0	DEGF	OK
CWT9022A	DISCHARGE CANAL WEIR TEMP	80.0	DEGF	OK
CWT2400A	TE-3091A COND A CW INLET TEMP	79.7	DEGF	OK
CWT2401A	TE-3091B COND A CW INLET TEMP	80.0	DEGF	OK
CWT2420A	TE-3092A COND B CW INLET TEMP	79.7	DEGF	OK
CWT2421A	TE-3092B COND B CW INLET TEMP	80.0	DEGF	OK
EMT0001C	EMT TIME ADJUSTMENT 0/1 EST/DST	0	NONE	OK
EMT0016	STABILITY CLASS (1-7 = A-G)	5		OK
EMT0017	RELATIVE HUMIDITY	60.1	PCNT	OK
CWT9022H	WEIR DISCH TEMP HALM SETPOINT	106.0	DEGF	OK
CWT9022W	WEIR DISCH TEMP HWRN SETPOINT	106.0	DEGF	OK
CWZ2460D	CIRC WATER PUMP A (UNIT 2)	ON		OK
CWZ2470D	CIRC WATER PUMP B (UNIT 2)	ON		OK
CWZ2480D	CIRC WATER PUMP C (UNIT 2)	ON		OK
CWZ9003D	CIRC WATER PUMP A (UNIT 1)	OFF		OK
CWZ9004D	CIRC WATER PUMP B (UNIT 1)	OFF		OK
SWZ3305D	SERVICE WATER PUMP A	ON		OK
SWZ3306D	SERVICE WATER PUMP B	ON		OK
SWZ3307D	SERVICE WATER PUMP C	ON		OK
SWZ3308D	SERVICE WATER PUMP D	ON		OK
SWZ3309D	SERVICE WATER BOOSTER PUMP A	ON		OK
SWZ3310D	SERVICE WATER BOOSTER PUMP B	ON		OK

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Manually Prepare and Issue an LCTR IAW NGGC-1301
119*012*R3*01

Alternate Path:

N/A

Facility JPM #:

JPM ADM-007 Rev. 0
RO / SRO

K/A Rating(s):

2.2.13 3.6/3.8

Task Standard:

Initiate an Equipment clearance on the "A" Condensate Pump IAW OPS-NGGC-1301, Equipment Clearance.

Preferred Evaluation Location:

This JPM can be performed anywhere P&IDs and EDPs are located

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EDP-001, 4160V AC Busses
EDP-007, Power Panels
P&ID G-190197, sheet 2

Validation Time: 20 min. **Time Critical:** No

Candidate: ______________________________ Time Start: _________
NAME Time Finish: _________

Performance Rating: SAT ______ UNSAT ______ Performance Time: _________

Examiner: ______________________ ______________________ /_______
NAME SIGNATURE DATE

Tools/Equipment/Procedures Needed:

P&IDs
EDPs

EXAMINER'S NOTE: **This JPM consists of initiating an Equipment Clearance on "A" Condensate Pump. See completed attachments:**

- **Attachment 1, Clearance Log Sheet**
- **Attachment 3, Operations Clearance Form**
- **Attachment 4, Operations Clearance Tag Sheet**

The highlighted (yellow) information is required to satisfactorily accomplish this task. Additionally, the asterisks (red) indicate the correct sequence for hanging the tags on specific components.

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Initiate an Equipment Clearance:

When I tell you to begin, you are to initiate an equipment clearance. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant is stable at 35% power
2. "A" Condensate Pump was secured due to excessive vibration
3. Mechanical Maintenance has submitted a Clearance Request to replace "A" Condensate Pump

INITIATING CUES:

Initiate an equipment clearance on "A" Condensate Pump up to but not including writing tags for the required components.

ATTACHMENT 2
Sheet 1 of 1
Clearance Request Form

To be completed by the Requestor. (Please print.)

A. Name Jim Doe Ext. No. XXXX

Work Group Mech. Maint. Date Today

B. (1) Unit # 2

(2) System # 3070

(3) Equipment to be cleared "A" Condensate Pump

C. Clearance Specifications (Circle your choices.)

(1)	New Request	Y / N
(2)	Addition or Boundary Change to Clearance #	N/A
(3)	Fluid Boundary	Y / N
(4)	System Depressurized	Y / N
(5)	System Drained	Y / N
(6)	Pneumatics Isolated	Y / N
(7)	Power Supply Breaker Racked Out/Off	Y / N
(8)	Motor Heater De-energized	Y / N
(9)	Logic power De-energized	Y / N
(10)	Control Power De-energized	Y / N
(11)	Other Group Support Required	Y / N ______ Group ID
(12)	Is Support Group Work Included	Y / N
(13)	Proposed Tag Sheet Attached	Y / N
(14)	Components To Be Manipulated Within Clearance Boundary	Y / N
(15)	Radwaste	Y / N
(16)	Clearance Boundary Change Form included for subsequent work.	Y / N
(17)	Grounds Required	Y / N

D. Reference drawings and procedures (attach list if necessary)

E. Special requests, precautions, and prerequisites

F. Date/Time Needed Today / ______ or Event ______

ATTACHMENT 1
Page 1 of 1
CLEARANCE LOG SHEET

CLEARANCE NO.	SYSTEM NO.	COMPONENT DESCRIPTION	REASON	HUNG DATE	COMPLETED DATE	REMARKS
990001	3070	'A' Condensate Pump	~~Replace Pump~~			

Clearance No. 99- 001 #

Work Control Center Approval — System No. 3070 #

Equipment to be Cleared COND-PMP-A / CONDENSATE PUMP A #

Is a Tech Spec/ESF/Fire Protection System Involved? NO

Ref. No. ______ ______ ______ ______ ______

OPERATOR'S NAME #

Prepared By ______ Date ______ Time ______

Verified By ______ Date ______ Time ______

Authorization to hang: Equipment may be removed from service per clearance tag sheet and required documents listed in 2.1 have been activated

Tech Spec/ESF/Fire system operability affected? NO #

Required Documents: ______ ______ ______ ______ ______

Authorized By SRO ______ Date ______ Time ______

Clearance Hung. (Clearance Tag Sheet completed as requested)

CP&L Operator ______ Date ______ Time ______

Clearance Accepted: ividual signing has verified ... establishes adequate boundary.			5.0 Clearance Completed: Equipment ready to be operated or remark made as to why not.		
Signature	Date / Time	Grounds Req	Signature	Date / Time	Grounds Rem
		Y / N			Y / N
		Y / N			Y / N
		Y / N			Y / N
		Y / N			Y / N
		Y / N			Y / N
		Y / N			Y / N
		Y / N			Y / N
		Y / N			Y / N

Authorization to Cancel: All individuals signing Step 4.0 must sign Step 5.0 before clearance is canceled

1 Restored Position and Order to be Restored sections filled out.

WCC ______ Date ______ Time ______

2 Clearance may be canceled as per Tag Sheet and Precautions

SRO ______ Date ______ Time ______

0 Review - Equipment realigned as Required? YES / NA Clearance Removed from required documents? Y

OP V/E L/U Updated? YES / NA

SRO ______ Date ______ Time ______

ial Instructions ______

CLEARANCE DOES NOT PROVIDE DOUBLE VALVE ISOLATION AS REQUIRED BY OPS-NGGC-1301

#

Special Instructions Continuation

Clearance No. 99-. .
System No. 3070

l Instructions 9.2.1.13. **SSO PERMISSION REQUIRED PRIOR TO HANGING/PERFORMING WORK**
R THIS CLEARANCE. #

CLEARANCE NO. 99- 0001
PAGE NO. 1

NAME (PRINT)	INT	NAME (PRINT)

…it Verification Required? NO If No, N/A the Blocks
…r Order is not Important

**ORDER TO BE HUNG	COMPONENT ID/LOCATION	CLEARANCE POSITION	ATTACHED BY (INITIAL)	IND. VER.	RESTORED POSITION	**ORDER TO BE RESTORED	REMOVED BY (INITIAL)	IND. VER.*
1	**1/COND-PMP-A CONTROL SWITCH FOR MAIN COND PUMP A CRM RTGB**	**OFF/CAPPED**			**OFF/UNCAPPED**	**5**		N/A
2	**4160-1(6) CONDENSATE PUMP A TUR2-S32 (4160V BUS 1)**	**RACKED OUT FUSES REMOVED**			**RACKED OUT FUSES REMOVED**	**4**		N/A
2	**PP-21-20 AC CKT BKR FOR CONDENSATE PUMP A MOTOR HEATER TUR1-O7-4(CHEM FD RM)**	**OFF**			**ON**	**4**		N/A
3	**C-3A COND PMP A DISCH ISOL VLV TUR1-V15-2**	**CLOSED**			**LOCKED OPEN**	**3**		N/A
3	**C-222A COND PMP A DISCH SAMPLE ISOL VLV TUR1-Y13 UNDER GRATE**	**CLOSED**			**OPEN**	**3**		N/A
3	**C-113 COND PMP A SEAL WTR DISCH DRN VLV TUR1-W13 UNDER GRATE**	**CLOSED**			**OPEN**	**3**		N/A
3	**C-64 COND PMP A SEAL SUPPLY ISOL VLV TUR1-V15-5**	**CLOSED**			**OPEN**	**3**		N/A
4	**C-1A COND PMP A SUCTION ISOL VLV TUR1-W14 UNDER DECK PLATE**	**CLOSED**			**OPEN**	**2**		N/A
4	**SW-166 CONDENSATE PMP "A" MOTOR INLET VALVE TUR1-V12-3**	**CLOSED**			**OPEN**	**2**		N/A
5	**C-11A COND PMP A SUCTION DRN VLV TUR1-X14-UNDER GRATE**	**OPEN, CAP REMOVED**			**CLOSED, CAP INSTALLED**	**1**		N/A
5	**C-115 COND PUMP "A" SUCTION TEST ISOL TUR1-V14 UNDER GRATE**	**OPEN, CAP REMOVED**			**CLOSED, CAP INSTALLED**	**1**		N/A

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Authorize Local Clearance and Test Requirements IAW OMM-005
341*054*R3*02

Alternate Path:

N/A

Facility JPM #:

JPM ADM-008 Rev. 0
SRO

K/A Rating(s):

2.2.13 3.6/3.8

Task Standard:

Review / approve equipment clearance on the "B" EHC Unloader Filter Bank. Correct power supply, valve positioning sequence, and add Special Instructions prior to approval.

Preferred Evaluation Location:

This JPM can be performed anywhere P&IDs and EDPs are located

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EDP-003
P&ID

Validation Time: 15 min. **Time Critical:** No

Candidate: __________________________________
NAME

Time Start: _________
Time Finish: _________

Performance Rating: SAT ______ UNSAT ______

Performance Time: _________

Examiner: ________________________ ____________________________ / ________
NAME SIGNATURE DATE

Tools/Equipment/Procedures Needed:

P&IDs
EDPs

EXAMINER'S NOTE: **This JPM consists of approving an Equipment Clearance on the "B" EHC Unloader Filter Bank. See completed attachments:**

- **Attachment 1, Clearance Log Sheet**
- **Attachment 2, Clearance Request Form**
- **Attachment 3, Operations Clearance Form**
- **Attachment 4, Operations Clearance Tag Sheet**

This clearance can not be approved as written for the following reasons:

- **Tag 02: Power supply is wrong ... should be MCC-3 (2J)**
- **Tags 03 & 04 hanging sequence is wrong ... should isolate discharge prior to suction valve**
- **This clearance requires Special Instructions due to:**
    - **no double valve isolation (9.2.1.13)**
    - **no drain path available (9.2.1.23)**

After the operator makes the above corrections, he/she should sign & date the Authorized By SRO blank.

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Initiate an Equipment Clearance:

When I tell you to begin, you are to review / approve an equipment clearance. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant is at 100% power
2. Maintenance has requested an equipment clearance on the "B" EHC Unloader Filter Bank.
3. The PTR PLUS Clearance computer is not in service.

INITIATING CUES:

Review / approve an equipment clearance on the "B" EHC Unloader Filter Bank.

ATTACHMENT 1
Page 1 of 1
CLEARANCE LOG SHEET

CLEARANCE NO.	SYSTEM NO.	COMPONENT DESCRIPTION	REASON	HUNG DATE	COMPLETED DATE	REMARKS
99-00001	5015	"B" EHC Unloader Filter Bank	REPLACE FILTER			

ATTACHMENT 2
Sheet 1 of 1
Clearance Request Form

To be completed by the Requestor. (Please print.)

A. Name JEFF DOE Ext. No. xxxx

Work Group MAINT. Date TODAY

B. (1) Unit # 2

(2) System # 5015

(3) Equipment to be cleared "B" EHC UNLOADER FILTER BANK

C. Clearance Specifications (Circle your choices.)

(1)	New Request	Y / N
(2)	Addition or Boundary Change to Clearance #	NA
(3)	Fluid Boundary	Y / N
(4)	System Depressurized	Y / N
(5)	System Drained	Y / N
(6)	Pneumatics Isolated	Y / N
(7)	Power Supply Breaker Racked Out/Off	Y / N
(8)	Motor Heater De-energized	Y / N
(9)	Logic power De-energized	Y / N
(10)	Control Power De-energized	Y / N
(11)	Other Group Support Required	Y / N ________ Group ID
(12)	Is Support Group Work Included	Y / N
(13)	Proposed Tag Sheet Attached	Y / N
(14)	Components To Be Manipulated Within Clearance Boundary	Y / N
(15)	Radwaste	Y / N
(16)	Clearance Boundary Change Form included for subsequent work.	Y / N
(17)	Grounds Required	Y / N

D. Reference drawings and procedures (attach list if necessary)

E. Special requests, precautions, and prerequisites

F. Date/Time Needed TODAY / ________ or Event ________

ATTACHMENT 3
Sheet 1 of 1
Operations Clearance Form

Clearance No. 9900001
System No. 5015

1.0 Operations Approval

1.1 Equipment to be cleared "B" EHC UNLOADER FILTER BANK

1.2 Is a Tech Spec/ESF/Fire Protection System involved? Yes/No

T/S Ref. No. ________

1.3 JACK DOE — Prepared By — TODAY / — Date / Time

1.4 JILL DOE — Verified By — TODAY / — Date / Time

2.0 Authorization to hang: Equipment may be removed from service per Clearance Tag Sheet and required documents listed in 2.1 have been activated.

2.1 Tech Spec/ESF/Fire Protection System operability affected? Yes/No

Required Documents: ________

OPERATOR'S SIGNATURE — Authorized By SRO — Date / Time

3.0 Clearance Hung. (Clearance Tag Sheet completed as requested)

Signature — Date / Time

4.0 Clearance Accepted. Individual signing has verified clearance establishes adequate boundary			5.0 Clearance Completed. Equipment ready to be operated or remark made in the Special Instructions as to why not.		
Signature	Date/Time	Grounds Required	Signature	Date/Time	Grounds Removed
1		Y/N			Y/N
2		Y/N			Y/N
3		Y/N			Y/N
4		Y/N			Y/N
5		Y/N			Y/N
6		Y/N			Y/N
7		Y/N			Y/N

6.0 Authorization to Cancel: The individuals signing Step 4.0 must sign Step 5.0 before clearance is canceled.

6.1 All work completed. Ground removal authorized.

Signature — Date / Time

Restored Position and Order to be Restored sections prepared.

Signature — Date / Time

6.2 Clearance removal authorized as per Tag Sheet and Precautions

SRO — Date / Time

7.0 Review - Equipment Realigned as Required? Yes / NA

Clearance Removed from required documents? Yes / NA

OP V/E L/U Updated? Yes / NA

SRO — Date / Time

Special Instructions DOUBLE VALVE ISOLATION NOT PROVIDED: S-SO PERMISSION REQ'D
NO DRAIN PATH AVAILABLE

ATTACHMENT 4
Sheet 1 of 1
Operations Clearance Tag Sheet

Clearance No. 9900001

Page 1 of 1

INT	NAME (PRINT)	INT	NAME (PRINT)

* Independent Verification Required? YES/NO If NO, N/A the Blocks
** N/A if Order is not Important

TAG TYPE AND #	** ORDER TO BE HUNG	COMPONENT ID/ LOCATION	CLR POSITION	ATTACHED BY (INITIAL)	IND VER	RESTORED POSITION	** ORDER TO BE RESTORED	REMOVED BY (INITIALS)*	IND VER *
01	1	GOV FLUID PP B RTGB	PUMP OFF, SWITCH TAGGED			AUTO	4		N/A
02	2 #	MCC-2 (3J) MCC-3 (2J) EH GOV FLUID PUMP B	OFF			ON	3		N/A
03	* 3	EH-2 EH OIL PMP B SUCTION VLV	CLOSED			OPEN	2		N/A
04	* 4	EH-4 EH OIL PUMP B DISCHARGE	CLOSED			OPEN	1		N/A

Continued Y N

CLEARANCE LOG SHEET

CLEARANCE NO.	SYSTEM NO.	COMPONENT DESCRIPTION	REASON	HUNG DATE	COMPLETED DATE	REMARKS
99-00001	5015	"B" EHC Unloader Filter Bank	Replace Filter			

ATTACHMENT 2
Sheet 1 of 1
Clearance Request Form

To be completed by the Requestor. (Please print.)

A. Name JEFF DOE Ext. No. XXXX

Work Group MAINT. Date TODAY

B. (1) Unit # 2

(2) System # 5015

(3) Equipment to be cleared "B" EHC UNLOADER FILTER BANK

C. Clearance Specifications (Circle your choices.)

(1)	New Request	Y / N
(2)	Addition or Boundary Change to Clearance #	NA
(3)	Fluid Boundary	Y / N
(4)	System Depressurized	Y / N
(5)	System Drained	Y / N
(6)	Pneumatics Isolated	Y / N
(7)	Power Supply Breaker Racked Out/Off	Y / N
(8)	Motor Heater De-energized	Y / N
(9)	Logic power De-energized	Y / N
(10)	Control Power De-energized	Y / N
(11)	Other Group Support Required	Y / N ________ Group ID
(12)	Is Support Group Work Included	Y / N
(13)	Proposed Tag Sheet Attached	Y / N
(14)	Components To Be Manipulated Within Clearance Boundary	Y / N
(15)	Radwaste	Y / N
(16)	Clearance Boundary Change Form included for subsequent work.	Y / N
(17)	Grounds Required	Y / N

D. Reference drawings and procedures (attach list if necessary)

E. Special requests, precautions, and prerequisites

F. Date/Time Needed TODAY / ________ or Event ________

ATTACHMENT 3
Sheet 1 of 1
Operations Clearance Form

Clearance No. 9900001

System No. 5015

1.0 Operations Approval

1.1 Equipment to be cleared "B" EHC UNLOADER FILTER BANK

1.2 Is a Tech Spec/ESF/Fire Protection System involved? Yes/No

T/S Ref. No. ____________

1.3 JACK DOE
Prepared By — TODAY / — Date / Time

1.4 JILL DOE
Verified By — TODAY / — Date / Time

2.0 Authorization to hang: Equipment may be removed from service per Clearance Tag Sheet and required documents listed in 2.1 have been activated.

2.1 Tech Spec/ESF/Fire Protection System operability affected? Yes/No.

Required Documents: ____________

Authorized By SRO — Date / Time

3.0 Clearance Hung. (Clearance Tag Sheet completed as requested)

Signature — Date / Time

4.0 Clearance Accepted: Individual signing has verified clearance establishes adequate boundary — Signature	Date/Time	Grounds Required	5.0 Clearance Completed: Equipment ready to be operated or remark made in the Special Instructions as to why not. — Signature	Date/Time	Grounds Removed
1		Y/N			Y/N
2		Y/N			Y/N
3		Y/N			Y/N
4		Y/N			Y/N
5		Y/N			Y/N
6		Y/N			Y/N
7		Y/N			Y/N

6.0 Authorization to Cancel: The individuals signing Step 4.0 must sign Step 5.0 before clearance is canceled.

6.1 All work completed. Ground removal authorized.

Signature — Date / Time

Restored Position and Order to be Restored sections prepared.

Signature — Date / Time

6.2 Clearance removal authorized as per Tag Sheet and Precautions

SRO — Date / Time

7.0 Review - Equipment Realigned as Required? Yes / NA

Clearance Removed from required documents? Yes / NA

OP V/E L/U Updated? Yes / NA

SRO — Date / Time

Special Instructions ____________

ATTACHMENT 4
Sheet 1 of 1
Operations Clearance Tag Sheet

Clearance No. 9900001

Page 1 of 1

INT	NAME (PRINT)	INT	NAME (PRINT)

* Independent Verification Required? YES/NO If NO, N/A the Blocks
** N/A if Order is not Important

TAG TYPE AND #	** ORDER TO BE HUNG	COMPONENT ID/ LOCATION	CLR POSITION	ATTACHED BY (INITIAL)	IND VER	RESTORED POSITION	** ORDER TO BE RESTORED	REMOVED BY (INITIALS)*	IND VER *
01	1	GOV FLUID PP B RTGB	PUMP OFF, SWITCH TAGGED			AUTO	4		N/A
02	2	MCC-2(35) EH GOV FLUID PUMP B	OFF			ON	3		N/A
03	3	EH-2 EH OIL PMP B SUCTION V/V	CLOSED			OPEN	2		N/A
04	4	EH-4 EH OIL PUMP B DISCHARGE	CLOSED			OPEN	1		N/A

Continued Y N

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Approve Radioactive Waste Discharge/Release Permits
341*012*R3*02

Alternate Path:

N/A

Facility JPM #:

JPM ADM-009 Rev. 0
SRO

K/A Rating(s):

2.3.6 2.1/3.1

Task Standard:

Determine that this release permit can not be approved as written.

Preferred Evaluation Location:

This JPM can be performed anywhere

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

EMP-023, Liquid Waste Release and Sampling

Validation Time: 20 min. **Time Critical:** No

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ______________________________ ______________________________/________
NAME SIGNATURE DATE

Tools/Equipment/Procedures Needed:

EMP-023, Liquid Waste Release and Sampling
Completed EMP-023, Attachment 10.3 (hand-written)
- "A" Monitor Tank
- Unit 1, both Circ Pumps used for Dilution Flow
- E&C Supervisor signature N/A'd for Release Approval

EXAMINER'S NOTE: This JPM consists of reviewing a Liquid Waste Release Permit. The operator should NOT approve the permit based on the following discrepancies (see attached):
- **Unit 1 used for dilution flow without the required official letter attached**
- **Wrong dilution flow ... should be 80,000 gpm for 2 Unit 1 Circ Pumps**
- **E&C Supervisor Release Approval required due to 10CFR50 Quarterly Limit (Total Body) exceeded 50%**

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Liquid Waste Release Permit Approval:

When I tell you to begin, you are to review/approve a Liquid Waste Release Permit. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Unit 1 is at 100 MWe
2. Unit 2 is at 100%
3. Lake Robinson temperature is 86°F

INITIATING CUES:

E&RC has sampled the "A" Monitor Tank and requests approval for the Liquid Waste Release Permit. You are the Superintendent-Shift Operations. You are to review / approve the Release Permit IAW appropriate station procedures.

CAROLINA POWER AND LIGHT COMPANY
ROBINSON S.E.G PLANT
LIQ PROC NAME
iquid Radioactive Release Permit
re-Release Supplementary Data

9900XX-L

PART I: PRE-RELEASE DATA

RELEASE POINT (2): MONITOR TANKS A / B
DISCHARGE POINT (1): WASTE DISPOSAL SYSTEM
Dilution Stream (1): DISCHARGE CANAL

Permit Issued: TODAY

Release Type: Batch

Waste Tank Volume: 1.0000E+04 GAL
Recirc. Start: TODAY 01:00:00
Sample After: TODAY 02:01:00

Recirc. Rate: 6.0000E+01 GPM
Min Recirc Time: 61 MIN
Agitator Used:

Rad Monitor: ( ) R-18
Rad Monitor Bckgrnd: 1.1200E+04 CPM

( ) N/A
0.0000E+00

Estim. Dilution Flow: 4.0000E+05 GPM
Estim. Dilution Vol.: 1.0000E+08 GAL
Dilution Factor (Act): 2.5010E+03
Estim. Release Start: TODAY
Estim. Release End: TODAY

Estim. Waste Flow: 4.0000E+01 GPM
Estim. Waste Vol.: 1.0000E+04 GAL
Estim. Duration: 250.00 MIN

PART II: PRE-RELEASE CALCULATIONS

Sample Entry # : 204
Sample time:
Configuration File Name: N/A

Sampled by:

Total Waste Activity: 4.4668E+01 Curies
Total Waste Conc/ECL: 1.1800E+03
Dilution Allocation: 2.5000E-01
Min Dilution Flow: 3.7745E+05 GPM
Dilution Strm Sample: 0
Max Monitor Setpoint: 1.4009E-02 uCi/ml
3.8217E+06 CPM

Total Waste Conc: 1.1800E+00 uCi/ml
Total Gamma Conc: 4.0752E-06
Concurrent Releases: 1
Max Waste Flow: 4.0000E+01 GPM
Dilution Conc/ECL: 4.7182E-01
Flag:
Rqrd Dilution Fct: 2.3600E+03

Setpoint data for other dilution flow rates:

Dilution (GPM)	Max Waste (GPM)	Setpoint (uCi/ml)	Setpoint (CPM)		Flag
5.0000E+04	5.2987E+00	0.0000E+00	1.1200E+04	(MAX)	F
1.6000E+05	1.6956E+01	0.0000E+00	1.1200E+04	(MAX)	F
2.5000E+05	2.6494E+01	0.0000E+00	1.1200E+04	(MAX)	F
4.0000E+05	4.2390E+01	1.4009E-02	3.8217E+06	(MAX)	

Flags: F- Waste Flow > Max Allowable

ISOTOPIC IDENTIFICATION - Unit 2

ISOTOPE		Pre-Dilut Measured uCi/ml	Pre-Dilut Measured Conc/ECL	Pre-Dilut Measured Conc/Total	Post Dilution uCi/ml	Post Dilution Conc/ECL	Estimated Curies Released
CO-57	P	1.12E-08	1.87E-04	9.49E-09	4.48E-12	7.46E-08	4.24E-07
FE-55	O	4.13E-07	4.13E-03	3.50E-07	1.65E-10	1.65E-06	1.56E-05
H-3	O	1.18E+00	1.18E+03	1.00E+00	4.72E-04	4.72E-01	4.47E+01
XE-133	N	4.06E-06	2.03E-02	3.44E-06	1.62E-09	8.12E-06	1.54E-04
Totals		1.18E+00	1.18E+03		4.72E-04	4.72E-01	4.47E+01

CAROLINA POWER AND LIGHT COMPANY
ROBINSON S.E.G PLANT
LIQ PROC NAME
Liquid Radioactive Release Permit
Pre-Release Supplementary Data

9900XX-L

Dose Calculation by Isotope (mrem) from This Release

Unit 2

Isotope	:Bone	:Liver	:Tot-body	:Thyroid	:Kidney	:Lung	:GI-LLI
CO-57	:4.73E-11	:1.35E-10	:2.10E-10	:4.73E-11	:4.73E-11	:4.73E-:11	:2.53E-09
FE-55	:1.13E-07	:7.84E-08	:1.83E-08	:0.00E+00	:0.00E+00	:4.37E-08	:4.50E-08
H-3	:0.00E+00	1.11E-01:	:1.11E-01	:1.11E-01	:1.11E-01	:1.11E-01	:1.11E-01
Totals	:1.13E-07	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02

CAROLINA POWER AND LIGHT COMPANY
ROBINSON S.E.G PLANT
LIQ PROC NAME
.quid Radioactive Release Permit
Pre-Release Supplementary Data

9900XX-L

Report Category	: Cumulative Maximum Individual Dose (mrem) for
	: Controlling Age Group at Controlling Location
Type of Activity	: Radioiodines and Particulates
Age Group & Pathway(s)	: Adult . sff wr
Location	: NE at 6.760 km.
Unit number	: 2

	Bone	Liver	Tot-body	Thyroid	Kidney	Lung	GI-LLI
This Release	1.13E-07	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02
31D Prior To Rel	3.42E-07	3.42E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03
31D After Release	4.56E-07	1.45E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02
31 Day Limit	2.00E-01	2.00E-01	6.70E-02	2.00E-01	2.00E-01	2.00E-01	2.00E-01
% 31 Day Limit	0.00%	7.26%	21.46%	7.20%	7.20%	7.20%	7.20%
`tr Prior .o Rel	6.06E-06	6.89E-01	7.54E-01	1.86E+00	1.86E+00	1.86E+00	1.86E+00
Qtr After Release	6.18E-06	7.00E-01	7.66E-01	1.88E+00	1.88E+00	1.88E+00	1.88E+00
Quarterly Limit	5.00E+00	5.00E+00	1.5E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
% Quarter Limit	0.00%	14.00%	51.04%	37.63%	37.63%	37.63%	37.63%
Ann Prior To Rel	8.92E-05	9.86E-01	7.88E-01	2.18E+00	2.18E+00	2.18E+00	2.18E+00
Ann After Release	8.93E-05	9.97E-1	7.99E-01	2.19E+00	2.19E+00	2.19E+00	2.19E+00
Annual Limit	1.00E+01	1.00E+01	3.00E+00	1.00E+01	1.00E+01	1.00E+01	1.00E+01
% Annual Limit	0.00%	9.97%	26.63%	21.90%	21.90%	21.90%	21.90%

ATTACHMENT 10.3

LIQUID WASTE RELEASE PERMIT (BATCH RELEASES)

RELEASE NUMBER: 9900XX-L SSN: 123456 DATE: TODAY

This revision is the latest revision available as verified by:

John Doe	[signature]	[signature]	TODAY
Name (Print)	Initial	Signature	Date

PART I: RELEASE INFORMATION (E&C)

Waste Condensate Tank: A B C D E Monitor Tank: (A) B S/G Drainage: A B C Other................ ________	Estimated Release Start TODAY (Date) ____ (Time) Estimated Release Stop TODAY (Date) ____ (Time)

10CFR20 Compliance

Dilution Flow Data			Release Rate Data	[illegible] Monitor Data	
Unit Involved[1]	No. of Pumps	Dilution Flow (GPM)	Max. Release Rate (GPM)	Monitor Name	Setpoint (CPM)
(1) or 2	1, (2) or 3	80000	5	R-18	1E04

DOSE ASSESSMENT

31 DAY DOSE PROJECTION		10CFR50 QUARTERLY LIMIT		10CFR50 ANNUAL LIMIT	
ORGAN	% LIMIT	ORGAN	% LIMIT	ORGAN	% LIMIT
GI-LLI	7.20	GI-LLI	37.63	KIDNEY	21.90
TOTAL BODY	21.46	TOTAL BODY	51.04	TOTAL BODY	26.63

NOTE: DO NOT USE UNIT #1 CIRCULATING WATER PUMPS WITHOUT AN OFFICIAL LETTER FROM UNIT #1 OPERATIONS.

Release requires E&C Supervisor Approval if: (1) Any 31 day dose projection limit exceeds 90%, or (2) Any 10CFR50 Quarterly Limit exceeds 50% or (3) Any 10CFR50 Annual Limit exceeds 50%.

Prepared By: [signature]

Release Approval
E&C Supervisor: N/A

ATTACHMENT 10.3

Page 2 of 2

LIQUID WASTE RELEASE PERMIT (BATCH RELEASES)

Release # _____

PART II: RADIATION MONITOR INFORMATION[1] (OPS and E&C) (CR 98-00002)		
Reading	R-18	R-19 ( )
Prior[4]	CPM	CPM
Source Check[5]	OPS INI.	E&C INI.
Setpoint Verified at[6]	CPM	CPM
Status Board Updated	OPS INI.	OPS INI.
Monitor Reading During Release	CPM	CPM
Monitor Reading After Release	CPM	CPM

Approved for Release: ______________________________ (CR 97-00059)
(Superintendent Shift Ops)

PART III: RELEASE INFORMATION[1] (OPS) (CR 98-00002)

Number of Circulating Water Pumps in Service: ______ [Unit 1 or 2] (circle one)
Radwaste Treatment System:[2] Operable ______ Inoperable ______ (Init.)

Release	Date	Time	Tank or SG Level	Integrator
Start				
Stop				
Difference		MIN.	GAL.	GAL.
FI-1064 (GPM)[3]		Actual Release Rate (GPM)		

1. N/A all blanks not applicable.
2. If quarterly % of limit is ≥ 13 % to the total body or ≥ 12% to any organ, see ODCM Specification 2.9.1 and 2.9.2.
3. If FI-1064 is out of service, estimate flow every 4 hours.
4. If Rad Monitor is out of service, refer to Section 7.0 of EMP-023.
5. Source check required prior to each batch release via R-18 or R-19 A, B, or C .
6. Log actual value which the setpoint was changed to.
7. If any limit is exceeded, make immediate notification to the Superintendent Shift Operations and the E&C Supervisor

Rad Monitor Information Completed By: ______________________________
(R-18: Control OPS. or R-19: E&C Tech)

Release Information Completed By: ________________/________________
(Aux. OPS/Control OPS)

Reviewed By: ______________________________
(Shift Superintendent)

POST RELEASE REVIEW

Release Posted By: ______________________________ Date: __________

Sample Composited By: ______________________________ Date: __________

________________	__________	________________	__________
Reviewed By	Date	E&C Supervisor	Date

PART I: PRE-RELEASE DATA

RELEASE POINT (2): MONITOR TANKS A / B
DISCHARGE POINT (1): WASTE DISPOSAL SYSTEM
Dilution Stream (1): DISCHARGE CANAL

Permit Issued: TODAY

Release Type: Batch

Waste Tank Volume: 1.0000E+04 GAL
Recirc. Start: TODAY 01:00:00
Sample After: TODAY 02:01:00

Recirc. Rate: 6.0000E+01 GPM
Min Recirc Time: 61 MIN
Agitator Used:

Rad Monitor: ( ) R-18 ( ) N/A
Rad Monitor Bckgrnd: 1.1200E+04 CPM 0.0000E+00

Estim. Dilution Flow: 4.0000E+05 GPM
Estim. Dilution Vol.: 1.0000E+08 GAL
Dilution Factor (Act): 2.5010E+03
Estim. Release Start: TODAY
Estim. Release End: TODAY

Estim. Waste Flow: 4.0000E+01 GPM
Estim. Waste Vol.: 1.0000E+04 GAL
Estim. Duration: 250.00 MIN

PART II: PRE-RELEASE CALCULATIONS

Sample Entry # : 204
Sample time:
Configuration File Name: N/A

Sampled by:

Total Waste Activity: 4.4668E+01 Curies
Total Waste Conc/ECL: 1.1800E+03
Dilution Allocation: 2.5000E-01
Min Dilution Flow: 3.7745E+05 GPM
Dilution Strm Sample: 0
Max Monitor Setpoint: 1.4009E-02 uCi/ml
3.8217E+06 CPM

Total Waste Conc: 1.1800E+00 uCi/ml
Total Gamma Conc: 4.0752E-06
Concurrent Releases: 1
Max Waste Flow: 4.0000E+01 GPM
Dilution Conc/ECL: 4.7182E-01
Flag:
Rqrd Dilution Fct: 2.3600E+03

Setpoint data for other dilution flow rates:

Dilution (GPM)	Max Waste (GPM)	Setpoint (uCi/ml)	Setpoint (CPM)	Flag
5.0000E+04	5.2987E+00	0.0000E+00	1.1200E+04 (MAX)	F
1.6000E+05	1.6956E+01	0.0000E+00	1.1200E+04 (MAX)	F
2.5000E+05	2.6494E+01	0.0000E+00	1.1200E+04 (MAX)	F
4.0000E+05	4.2390E+01	1.4009E-02	3.8217E+06 (MAX)	

Flags: F- Waste Flow > Max Allowable

ISOTOPIC IDENTIFICATION - Unit 2

ISOTOPE		Pre-Dilut Measured uCi/ml	Pre-Dilut Measured Conc/ECL	Pre-Dilut Measured Conc/Total	Post Dilution uCi/ml	Post Dilution Conc/ECL	Estimated Curies Released
CO-57	P	1.12E-08	1.87E-04	9.49E-09	4.48E-12	7.46E-08	4.24E-07
FE-55	O	4.13E-07	4.13E-03	3.50E-07	1.65E-10	1.65E-06	1.56E-05
H-3	O	1.18E+00	1.18E+03	1.00E+00	4.72E-04	4.72E-01	4.47E+01
XE-133	N	4.06E-06	2.03E-02	3.44E-06	1.62E-09	8.12E-06	1.54E-04
Totals		1.18E+00	1.18E+03		4.72E-04	4.72E-01	4.47E+01

Dose Calculation by Isotope (mrem) from This Release

Unit 2

Isotope	:Bone	:Liver	:Tot-body	:Thyroid	:Kidney	:Lung	:GI-LLI
CO-57	:4.73E-11	:1.35E-10	:2.10E-10	:4.73E-11	:4.73E-11	:4.73E-:11	:2.53E-09
FE-55	:1.13E-07	:7.84E-08	:1.83E-08	:0.00E+00	:0.00E+00	:4.37E-08	:4.50E-08
H-3	:0.00E+00	1.11E-01:	:1.11E-01	:1.11E-01	:1.11E-01	:1.11E-01	:1.11E-01
Totals	:1.13E-07	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02

Report Category : Cumulative Maximum Individual Dose (mrem) for
: Controlling Age Group at Controlling Location
Type of Activity : Radioiodines and Particulates
Age Group & Pathway(s) : Adult . sff wr
Location : NE at 6.760 km.
Unit number : 2

	Bone	Liver	Tot-body	Thyroid	Kidney	Lung	GI-LLI
This Release	1.13E-07	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02
31D Prior To Rel	3.42E-07	3.42E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03
31D After Release	4.56E-07	1.45E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02
31 Day Limit	2.00E-01	2.00E-01	6.70E-02	2.00E-01	2.00E-01	2.00E-01	2.00E-01
% 31 Day Limit	0.00%	7.26%	21.46%	7.20%	7.20%	7.20%	7.20%
Qtr Prior To Rel	6.06E-06	6.89E-01	7.54E-01	1.86E+00	1.86E+00	1.86E+00	1.86E+00
Qtr After Release	6.18E-06	7.00E-01	7.66E-01	1.88E+00	1.88E+00	1.88E+00	1.88E+00
Quarterly Limit	5.00E+00	5.00E+00	1.5E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
% Quarter Limit	0.00%	14.00%	51.04%	37.63%	37.63%	37.63%	37.63%
Ann Prior To Rel	8.92E-05	9.86E-01	7.88E-01	2.18E+00	2.18E+00	2.18E+00	2.18E+00
Ann After Release	8.93E-05	9.97E-1	7.99E-01	2.19E+00	2.19E+00	2.19E+00	2.19E+00
Annual Limit	1.00E+01	1.00E+01	3.00E+00	1.00E+01	1.00E+01	1.00E+01	1.00E+01
% Annual Limit	0.00%	9.97%	26.63%	21.90%	21.90%	21.90%	21.90%

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start a Reactor Coolant Pump IAW OP-101
003*001*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-001
RO / SRO

K/A Rating(s):

003 000	A1.05	3.4/3.5
	A3.01	3.3/3.2
	A3.03	3.2/3.1
	A3.04	3.6/3.6
	A4.01	3.3/3.2
	A4.04	3.1/3.0
	GEN.13	3.6/3.7

Task Standard:

"B" RCP running and degraded voltage protection returned to normal.

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OP-101, Section 5.1

Validation Time: 20 min. **Time Critical:** No

Candidate: ____________________________
NAME

Time
Time Start : ________
Time Finish: ________

Performance Time (min): _________

Performance Rating: SAT ______ UNSAT ______

Examiner: ____________________________ ____________________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 11
Critical because calculation involved to determine required No. 1 Seal DP.

Step 29
Critical because starting an RCP without Degraded Grid Protection bypassed would initiate Emergency Bus Sequencer action.

Step 31
Critical because starting an RCP without Degraded Grid Protection bypassed would initiate Emergency Bus Sequencer action.

Step 33
Critical because starting an RCP without the Bearing Oil Lift Pump running with adequate oil/pressure supplied to the Upper Thrust Shoes would cause damage to the RCP.

Step 34
Critical because a minimum of 2 minutes of Bearing Lift Pump operation is specified prior to RCP start.

Step 35
Critical because a minimum of 50 seconds of RCP operation is required prior to stopping the Bearing Lift Pump.

Step 36
Critical because enabling Degraded Grid Voltage Protection with the signal present (light bulb burnt out) would cause Emergency Bus Sequencer action.

Step 37
Critical because this is the last RCP to be started and Technical Specification 3.3.5 requires Degraded Grid Protection (E2) enabled.

Step 39
Critical because enabling Degraded Grid Voltage Protection with the signal present (light bulb burnt out) would cause Emergency Bus Sequencer action.

Step 40
Critical because this is the last RCP to be started and Technical Specification 3.3.5 requires Degraded Grid Protection (E2) enabled.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-211, go to RUN and activate CAEP 88_JPM_CR_001_R11
2. If IC-211 is not functioning, perform the following:
   - Initialize simulator to IC-7 and go to RUN.
   - Stop "B" RCP, place PCV-455A in manual and close "B" Loop Spray Valve.
   - Allow simulator to stabilize before placing in Freeze
3. Place simulator in run when directed by the examiner.
4. APP-010-F5 and APP-010-F6 are illuminated when Degraded bus voltage is defeated (RFI EPD Local Actions EPS007, EPS008).
5. Once the operator has identified the correct procedure the evaluator will provide him a copy of OP-101, Section 5.1 with Steps 5.1.1.1 through 5.1.1.8 initialed as completed.

SIMULATOR OPERATOR INSTRUCTIONS:

Update Control Room Status Board to IC-7 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-101

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant is in hot standby
2. RCS is at 547°F and 2235 psig
3. "B" RCP was stopped 7 hours earlier for motor inspection
4. All plant controls are in auto/normal
5. No other plant equipment is OOS

INITIATING CUES:

The CRSS has directed you to start "B" RCP in accordance with plant procedures. The initial conditions associated with starting the RCP have been completed.

START TIME: ______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-101, section 5.1 **EXAMINER CUE: Hand the operator the copy of OP-101, section 5.1 (complete through 5.1.1.8) after he/she locates it.** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Verify open the No. 1 Seal leakoff valve for each RCP (Step 5.1.2.1) STANDARD: Operator determines CVC-303A, B, C Seal Leakoff valves are open by observing the red open light illuminated above the RTGB control switches COMMENTS:	____ SAT ____ UNSAT
STEP 3: Verify seal injection flow to each RCP is between 8 and 13gpm (Step 5.1.2.2) STANDARD: Direct an Auxiliary Operator to verify seal injection flows between 8 and 13gpm. **BOOTH INSTRUCTOR'S CUE: When directed, report all seal injection flows are ~9gpm.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: Verify Thermal Barrier labyrinth seal differential pressure (DP) is ≥ to 5 inches water column. (Step 5.1.2.3) STANDARD: Operator determines "B" RCP Thermal Barrier Labyrinth Seal DP is ≥ 5 inches water column on PI-128A. **EXAMINER'S NOTE: "B" RCP Thermal Barrier Labyrinth Seal DP indicates ~ 28"** COMMENTS:	____ SAT ____ UNSAT

NOTE: The No. 1 Seal by-pass system is used when RCS pressure is less than 1000 psig, to prevent the RCP pump bearing temperature and the No.1 Seal leakoff temperature from reaching alarm levels.

STEP 5: IF any No. 1 Seal leakoff flow rate is < 1 gpm AND RCS pressure is between 100 and 1000 psig, THEN open CVC-307, PRI SEAL BYP ISO. (Step 5.1.2.4) STANDARD: This step should be marked N/A, RCS pressure > 1000psig. All Seal leakoff flow rates verified > 1 gpm on RTGB recorders FR-154A (WR) and FR-154B (NR). **EXAMINER'S NOTE: RCS pressure ~2235 psig all seal leakoff flows ~3.5 gpm** COMMENTS:	____ SAT ____ UNSAT
STEP 6: Check that the maximum starting limits of Section 4.2.2 will not be exceeded. (Step 5.1.2.5) STANDARD: "B" RCP has not been started in the last 7 hours. Maximum starting limits verified satisfactory ... "B" RCP start allowed. COMMENTS:	____ SAT ____ UNSAT
STEP 7: Check the associated RCP STP HI AND RCP STP LO alarms are not illuminated on the 2x2 Status Light Panel. (Step 5.1.2.6) STANDARD: Operator determines "B" RCP STP HI AND RCP STP LO alarms are extinguished. COMMENTS:	____ SAT ____ UNSAT
STEP 8: Check that the associated RCP Oil Reservoir level annunciator is EXTINGUISHED. (Step 5.1.2.7) STANDARD: Operator determines APP-001-E8, RCP B OIL RESERV HI/LO LVL extinguished. COMMENTS:	____ SAT ____ UNSAT

STEP 9: Verify No. 1 Seal DP is > 210 psid. (Step 5.1.2.8) STANDARD: Operator determines "B" RCP No. 1 Seal DP > 210 psid on PI-155A. **EXAMINER'S NOTE: No. 1 Seal DP indicates > 400 psid** COMMENTS:	____ SAT ____ UNSAT
STEP 10: IF No. 1 Seal DP is ≤ 400 psid, THEN record No. 1 Seal DP as indicated on the associated instrument (Step 5.1.2.9.a) STANDARD: This step should be marked N/A, No. 1 Seal DP on PI-155A > 400 psid **EXAMINER'S NOTE: No. 1 Seal DP indicates > 400 psid** COMMENTS:	____ SAT ____ UNSAT
STEP 11: IF No. 1 Seal DP is > 400 psid, THEN calculate No. 1 Seal DP by subtracting VCT pressure from RCS pressure (Step 5.1.2.9.b) STANDARD: "B" RCP No. 1 Seal DP calculated/recorded by subtracting VCT pressure from RCS pressure. (1980 to 2200 psig) COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 12: If No. 1 Seal DP is an even multiple of 50, record value in step 5.1.2.9.c. Otherwise, round up to the next highest multiple of 50 and record in step 5.1.2.9.d. (Step 5.1.2.9.c,d) STANDARD: "B" RCP No. 1 Seal DP recorded. (2200 or 2250 psig) **EXAMINER'S NOTE: If operator calculated other than 2200 psig, he/she will round up to2250 psig.** COMMENTS:	____ SAT ____ UNSAT

STEP 13: Record the No. 1 Seal minimum leakoff flow from Table 2, that corresponds to the No. 1 Seal DP recorded above. (Step 5.1.2.9.e) STANDARD: .98 to 1.00 gpm recorded as the minimum No. 1 Seal leakoff flow for "B" RCP. COMMENTS:	____ SAT ____ UNSAT
STEP 14: Check the indicated No. 1 Seal leakoff flow is ≥ the minimum value recorded above AND ≤ 6 gpm. (Step 5.1.2.10) STANDARD: No. 1 Seal leakoff verified ≥ calculated value and ≤ 6 gpm by observing RTGB Recorders FR-154A and B. **EXAMINER'S NOTE: All seal leakoff flows indicate ~ 3.5 gpm** COMMENTS:	____ SAT ____ UNSAT
STEP 15: Verify VCT pressure is > 15 psig. (Step 5.1.2.11) STANDARD: Operator determines VCT pressure > 15 psig by observing PI-117 **EXAMINER'S NOTE: VCT pressure indicates ~ 25 psig** COMMENTS:	____ SAT ____ UNSAT
STEP 16: IF RCS pressure is > 400 °F, THEN verify VCT temperature is between 60 °F and 130 °F. (Step 5.1.2.12) STANDARD: VCT temperature verified between 60 °F and 130 °F on TI-116. **EXAMINER'S NOTE: VCT temperature indicates ~ 102 °F** COMMENTS:	____ SAT ____ UNSAT

STEP 17: IF RCS pressure is ≤ 400 °F, THEN verify VCT temperature is between 60 °F and 150 °F (Step 5.1.2.13) STANDARD: N/A, RCS temperature = 547 °F COMMENTS:	____ SAT ____ UNSAT

NOTE: The following CCW temperature limits are applicable for starting AND continuous operation of the RCPs.

STEP 18: IF RCS Cold Leg temperature is ≤ 350 °F, THEN verify CCW Heat Exchanger Outlet temperature is 44 °F to 125 °F. (Step 5.1.2.14.a) STANDARD: N/A, RCS Cold Leg temperature =547 °F COMMENTS:	____ SAT ____ UNSAT
STEP 19: IF RCS Cold Leg temperature is > 350 °F AND ≤ 475 °F, THEN verify CCW Heat Exchanger Outlet temperature is 44 °F to 105 °F (Step 5.1.2.14.b) STANDARD: N/A, RCS Cold Leg temperature = 547 °F COMMENTS:	____ SAT ____ UNSAT
STEP 20: IF RCS Cold Leg temperature is > 475 °F, THEN verify CCW Heat Exchanger Outlet temperature is 45 °F to 105 °F. (Step 5.1.2.14.c) STANDARD: Operator determines CCW Heat Exchanger Outlet temperature is between 45 °F and 105 °F on TI-607 **EXAMINER'S NOTE: CCW Heat Exchanger outlet temperature indicates ~ 83°F** COMMENTS:	____ SAT ____ UNSAT

STEP 21: Check the following bearing temperatures are within limits: (Step 5.1.2.15.a through e) a. Upper Thrust Brg < 185 °F b. Lower Thrust Brg < 185 °F c. Upper Guide Brg < 185 °F d. Lower Guide Brg < 185 °F e. Pump Brg < 175 °F STANDARD: "B" RCP Bearing temperatures checked within limits on Recorder TR-448. a. Point 9: Upper Thrust Brg < 185 °F b. Point 10: Lower Thrust Brg < 185 °F c. Point 11: Upper Guide Brg < 185 °F d. Point 12: Lower Guide Brg < 185 °F e. Point 14: Pump Brg < 175 °F **EXAMINER'S NOTE: Points 9 - 12 indicate ~88°F** **Point 14 indicates ~ 102°F** COMMENTS:	____ SAT ____ UNSAT
STEP 22: Check Stator Winding temperature < 248 °F. (Step 5.1.2.16) STANDARD: "B" RCP Stator Winding temperature checked < 248 °F on Recorder TR-448, Point 13. **EXAMINER'S NOTE: Point 13 indicates ~ 120°F** COMMENTS:	____ SAT ____ UNSAT
STEP 23: IF the RCP is to be operated continuously, AND the RCS is below 400 psig, THEN verify the LPMS switch on the RTGB is in the NORM position AND the system is aligned IAW OP-007. (Step 5.1.2.17) STANDARD: N/A, RCS pressure is at 2235 psig. COMMENTS:	____ SAT ____ UNSAT

STEP 24: IF this procedure has been directed by the EOP network, THEN the following step is not required. (Step 5.1.2.18) STANDARD: Operator marks this step N/A, not in the EOP network. COMMENTS:	____ SAT ____ UNSAT

NOTE: Monitoring the primary side of the S/G while starting a RCP will detect any potential loose part(s) that may become mobile. After the pump is started continuous monitoring of all channels for satisfactory indication is not necessary beyond two minutes.

STEP 25: Verify personnel are stationed to monitor the Digital Metal Impact Monitoring System (Loose Parts Monitor). (Step 5.1.2.19) STANDARD: Operator dispatches AO / STA to the LPMS. **BOOTH INSTRUCTOR'S CUE: When directed, respond that you are standing by at the Loose Parts Monitor** COMMENTS:	____ SAT ____ UNSAT
STEP 26: Notify Security AND I&C that a RCP will be started and that the Security UPS Inverter may trip (CR 98-00876) (Step 5.1.2.20) STANDARD: Security and I&C are notified of RCP start **BOOTH INSTRUCTOR'S CUE: If called, respond as Security and/or I&C. Acknowledge RCP start and the potential for the Security UPS Inverter to trip.** **EXAMINER'S CUE: If the operator requests the CRSS/SSO to notify Security and I&C, respond that Security and I&C have been notified.** COMMENTS:	____ SAT ____ UNSAT

STEP 27: IF this procedure has been directed by the EOP network, THEN the following step is not required. (Step 5.1.2.21) STANDARD: Operator marks this step N/A, not in the EOP network COMMENTS:	____ SAT ____ UNSAT

NOTE: The RCP motor heaters control switch is located in the Rod Control Room. One switch controls all three RCP motor heaters.

STEP 28: IF the RCP is to be operated continuously, THEN place the RCP-SPACE HEATER-SW control switch in the OFF position. (Step 5.1.2.22) STANDARD: Operator dispatches an AO to verify the RCP-SPACE HEATER-SW control switch in the OFF position. **EXAMINER'S NOTE:. The operator may not dispatch an AO due to this switch already being positioned to OFF** COMMENTS:	____ SAT ____ UNSAT

NOTE: ITS LCO 3.3.5 allows bypassing Degraded Grid Protection when the Unit is **NOT** in Mode 1.

STEP 29: On the front of Bus E-1, Cubicle 18A, install key in the DEGRADED GRID VOLTAGE keylock switch AND place in the DEFEAT position. (Step 5.1.2.23.a) STANDARD: Operator dispatches an AO to defeat Degraded Grid Protection **BOOTH INSTRUCTOR'S CUE: When directed, defeat Degraded Grid Protection on Bus E-1 RFI EPS007** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 30: Verify annunciator APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is ILLUMINATED. (Step 5.1.2.23.b) STANDARD: APP-010-F5 verified illuminated. COMMENTS:	____ SAT ____ UNSAT
STEP31: On the front of Bus E-2, Cubicle 28A, install key in the DEGRADED GRID VOLTAGE keylock switch AND place in the DEFEAT position. (Step 5.1.2.23.c) STANDARD: Operator dispatches an AO to defeat Degraded Grid Protection **BOOTH INSTRUCTOR: When directed, defeat Degraded Grid Protection on Bus E-2 RFI EPS008** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 32: Verify annunciator APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is ILLUMINATED. (Step 5.1.2.23.d) STANDARD: APP-010-F6 verified illuminated. COMMENTS:	____ SAT ____ UNSAT
STEP 33: Start the BRG LIFT PUMP AND verify the LIFT PRESSURE light ILLUMINATES. (Step 5.1.2.24) STANDARD: "B" RCP Bearing Lift Pump started and Lift Pressure light verified illuminated. COMMENTS: **Record BRG LIFT PUMP start time: __________**	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Only one Reactor Coolant Pump is to be started at a time.

STEP 34: WHEN the Brg Lift Pump has operated for a minimum of 2 minutes, THEN start the Reactor Coolant Pump. (Step 5.1.2.25) STANDARD: After a minimum of 2 minutes, the operator announces (over the plant page) and starts "B" RCP. Operator observes: •"B" RCP red light on, green light off •RCS LOOP 2 flow increases to ~100% value **EXAMINER'S NOTE: Plant announcement not included as critical task** COMMENTS: **Record RCP start time (hr:min:sec): __________** **Verify >2 minutes since time recorded in step 32**	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 35: WHEN a minimum of 50 seconds has elapsed since the Reactor Coolant Pump was started, THEN stop the BRG LIFT PUMP. (Step 5.1.2.26) STANDARD: After at least 50 seconds have elapsed since the "B" RCP was started, the Bearing Lift Pump is stopped. COMMENTS: **Record BRG LIFT PUMP stop time (hr:min:sec): __________** **Verify >50 seconds since time recorded in step 33**	**CRITICAL STEP** ____ SAT ____ UNSAT

CAUTION: Do not restore the Degraded Grid Voltage Protection to NORMAL until the Amber indicating light is Extinguished.

NOTE: The Degraded Grid Voltage keylock keys cannot be removed from switches unless positioned to NORMAL.

NOTE: If more than one RCP is to be started the degraded grid voltage protection may remain bypassed until all RCP starts have been completed.

STEP 36: Momentarily depress the amber E-1 DEGRADED GRID TRIP SIGNAL light cover AND verify the light ILLUMINATES. (Step 5.1.2.27.a, b) STANDARD: Operator directs AO to: • momentarily depress the amber E-1 DEGRADED GRID TRIP SIGNAL light cover AND verify the light ILLUMINATES • verify the light extinguishes when released **BOOTH INSTRUCTOR:** **When directed, report E-1 DEGRADED GRID TRIP SIGNAL light illuminates when depressed and is extinguished when released.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 37: Place E-1 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. (Step 5.1.2.27.c, d) STANDARD: Operator directs AO to place E-1 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. **BOOTH INSTRUCTOR:** **When directed, report the E-1 DEGRADED GRID VOLTAGE key switch in NORMAL and key removed.** **DRF EPS007** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 38: Verify annunciator APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is EXTINGUISHED. (Step 5.1.2.27.e) STANDARD: APP-010-F5, DEGRADED GRID E-1 PROT BYPD, verified EXTINGUISHED. COMMENTS:	____ SAT ____ UNSAT

STEP 39: Momentarily depress the amber E-2 DEGRADED GRID TRIP SIGNAL light cover AND verify the light ILLUMINATES. (Step 5.1.2.28.a,b) STANDARD: Operator directs AO to: • momentarily depress the amber E-2 DEGRADED GRID TRIP SIGNAL light cover AND verify the light ILLUMINATES • verify the light extinguishes when released **BOOTH INSTRUCTOR:** **When directed, report E-2 DEGRADED GRID TRIP SIGNAL light illuminates when depressed and is extinguished when released.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 40: Place E-2 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. (Step 5.1.2.28.c, d) STANDARD: Operator directs AO to place E-2 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. **BOOTH INSTRUCTOR:** **When directed, report the E-2 DEGRADED GRID VOLTAGE key switch in NORMAL and key removed. DRF EPS008** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 41: Verify annunciator APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is EXTINGUISHED. (Step 5.1.2.28.e) STANDARD: APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is verified EXTINGUISHED. COMMENTS:	____ SAT ____ UNSAT

TIME STOP: ________

END OF JPM

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the immediate actions of FRP-S.1
000*029*R5*01

Alternate Path:

Reactor will not trip from the RTGB
Turbine will not trip from the RTGB
Turbine will not runback from the RTGB

Facility JPM #:

JPM CR-004

K/A Rating(s):

004 A4.18	4.3/4.1	029 EA1.09	4.0/3.6
000 EA1.01	3.4/3.1	029 EA1.12	4.1/4.0
000 EA1.08	4.5/4.5	029 EA1.14	4.2/3.9
000 EA1.09	4.0/3.6	029 EA1.15	4.1/3.9
000 EA1.12	4.1/4.0	029 EA2.05	3.4/3.4
000 EA1.13	4.1/3.9	029 EA2.07	4.2/4.3
029 EA1.01	3.4/3.1	2.4.49	4.0/4.0

Task Standard:

Immediate actions associated with an ATWS condition performed IAW FRP-S.1

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ Perform __X__ Simulate ______

References:

FRP-S.1

Validation Time: 10 min. **Time Critical:** YES (3 min.)

		Overall Time	Critical Time
Candidate:	__________ NAME	Start: ______	Start: ______
		Finish: ______	Finish: ______
	Performance Time (min):	______	______

Examiner: __________ NAME __________ SIGNATURE / ______ DATE

COMMENTS

Step 4
Critical because operator must determine an automatic reactor trip signal was initiated and the reactor failed to trip

Step 6, 7
Critical because prompt operator action is required to insert negative reactivity to the reactor

Step 11
Critical because prompt operator action is required to trip the turbine to maintain adequate S/G levels (RCS heat sink)

Step 12
Critical because operator action is required to rapidly reduce Turbine load in the event of a failure of the Turbine to trip

Step 13
Critical because operator action is required to isolate the steam supply to the Turbine

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-5, go to RUN, and activate CAEP 88_JPM_CR_004_R7

2. If CAEP is not functioning, perform the following:
   - activate IMF RPS01A and 01B...failure to open in BOTH auto and manual
   - activate IMF TUR02A, B, C... failure of the turbine to trip
   - activate IMF TUR21B ...failure of OTΔT Runback
   - activate IMF TUR05C 100%..........Governor valves fail to respond
   - activate IMF TUR05D 16.8425% Governor valves fail to respond
   - activate IMF TUR05E 100% Governor valves fail to respond
   - activate IMF TUR05F 100% Governor valves fail to respond
   - Place the simulator in FREEZE.

3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

The CAEP has the following triggers included:

- E1 (88_JPM_CR_004): When Control Bank "D" reaches 210 steps (either by manual or automatic insertion), the Reactor Protection System malfunctions will be deleted

- E2 (88_JPM_CR_004_2): When Control Bank "D" reaches 208 steps, the reactor trips breakers will open.

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

FRP-S.1

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The unit is at 100% power. All controls are in auto/normal. No equipment is out-of-service.
2. You are the Reactor Operator and the BOP (the BOP has left the Control Room).

INITIATING CUES:

The CRSS directs you to respond to events as they occur

START TIME: ______

EXAMINER'S NOTE: This scenario starts at 100% power. Approximately 20 seconds after the simulator is placed in RUN, an 800 gpm RCS leak will occur. The operator will attempt to respond to annunciators as they occur. A second Charging Pump may be started to address excessive RCS leakage. The annunciators and bistables associated with OTΔT will alarm, however the runback and reactor trip will fail to occur. The operator should then realize an ATWS event is occurring.

STEP 1: APP-003-F4, CHG PMP HI SPEED alarms due to lowering RCS pressure STANDARD: Operator: • acknowledges/silences alarm • determines RCS pressure is decreasing by observing PI-444, 445, 455, 456, 457 • determines PZR level is decreasing by observing LI-460, 461, 459A • will check APP-003-F4 may start an additional Charging Pump may enter AOP-016 **BOOTH INSTRUCTOR'S NOTE: Initiate 800 gpm RCS Leak ~20 seconds after the simulator is placed in RUN. IMF RCS09A ... 800** COMMENTS:	____ SAT ____ UNSAT
STEP 2: The following annunciators alarm due to lowering RCS pressure and level: • APP-003-D8, PZR CONTROL HI/LO PRESS • APP-003-E8, PZR CONTROL HI/LO LVL STANDARD: Operator determines: • RCS leakage in progress • starts a second (or third) Charging Pump • all PZR Heaters are energized, Spray valves are closed • entry into AOP-016, Excessive RCS Leakage is required **EXAMINER'S NOTE: Operator may attempt manual reactor trip due to rapid RCS pressure reduction** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	APP-005-D5, OPΔT/OTΔT TURBINE RUNBACK ROD STOP alarms due to lowering RCS pressure	
STANDARD:	Operator determines: • OTΔT Rod Stop and Turbine Runback setpoint & coincidence satisfied • Turbine Runback not in progress	____ SAT
COMMENTS:		____ UNSAT

STEP 4:	APP-004 - E3, OVERTEMP ΔT TRIP (First Out Annunciator) alarms	**CRITICAL STEP**
STANDARD:	Operator determines the reactor failed to automatically trip by observing: • the First Out Annunciator and / or • the Reactor Trip Breaker red & green breaker indicating lights extinguished	____ SAT
COMMENTS:		____ UNSAT

TIME CRITICAL START TIME: ____________

STEP 5:	Check REACTOR TRIP As Follows: (Step 1) • REACTOR TRIP MAIN AND BYP BKRS - OPEN • Rod Position indication - ZERO • Rod Bottom lights - ILLUMINATED • Neutron Flux - DECREASING	____ SAT
STANDARD:	Recognizes the reactor is not tripped • Reactor Trip Main Bkrs - no indication • Rod Position indication CBD-218 • Rod Bottom lights NOT Illuminated • Neutron Flux ~ 100%	____ UNSAT
COMMENTS:		

STEP 6: Depress both Reactor Trip Pushbuttons (Step 1.a RNO.) STANDARD: Both Reactor Trip Pushbuttons on the RTGB depressed. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: Insert Control Rods. (Step 1.b.1 RNO) STANDARD: Control Rods inserted (in Auto or Manual) as indicated by decreasing Control Rod Bank height. **BOOTH INSTRUCTOR'S CUE: Reactor Trip malfunctions are triggered to be deleted when Control Bank "D" reaches 216 steps. (E1)** **The Reactor Trip Breakers are triggered to open when Control Bank "D" reaches 214 steps. (E2)** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: Dispatch an operator to the MG SET Room to trip the following breakers: (Step 1.b.2 RNO) • REACTOR TRIP BREAKER A & B • GENERATOR CIRCUIT BREAKER A & B STANDARD: An auxiliary operator is dispatched to the MG Set Room to trip the Reactor Trip breakers and Rod Drive MG Set Generator breakers **BOOTH INSTRUCTOR'S CUE: If/when directed, acknowledge order to trip the Reactor Trip breakers and Generator circuit breakers.** **EXAMINER'S CUE: This action is typically performed by the CRSS. IF the operator requests the CRSS / SSO make the plant PA to dispatch the auxiliary operators, acknowledge making the PA** COMMENTS:	____ SAT ____ UNSAT

EXAMINER'S NOTE: The operator may not dispatch auxiliary operators due to the Reactor Trip breakers opening as required.

STEP 9: Dispatch an operator to 480V Busses 2B and 3 to trip the following breakers: (Step 1.b.3 RNO) • ROD DRIVE MOTOR GENERATOR SET A & B STANDARD: An auxiliary operator is dispatched to 480V Busses 2B & 3 to trip the .Rod Drive MG Sets **BOOTH INSTRUCTOR'S CUE: If/when directed, acknowledge order to trip the Rod Drive MG Sets** **EXAMINER'S CUE: This action is typically performed by the CRSS. IF the operator requests the CRSS / SSO make the plant PA to dispatch the auxiliary operators, acknowledge making the PA** COMMENTS:	____ SAT ____ UNSAT
STEP 10: Check Turbine Trip As Follows: (Step 2) • BOTH Turbine Stop Valves - CLOSED OR • All Governor Valves - CLOSED STANDARD: Recognizes the Turbine is NOT Tripped • Both Turbine Stop valves are open • All Governor valves indicate open COMMENTS:	____ SAT ____ UNSAT
STEP 11: Manually trip the Turbine by simultaneously depressing the THINK and TURBINE TRIP Pushbuttons. (Step 2.a RNO) STANDARD: THINK and TURBINE TRIP Pushbuttons manually depressed. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 12:	IF the Turbine will NOT trip, THEN run back Turbine at maximum rate until the Governor Valves are closed. (Step 2.b RNO)	**CRITICAL STEP**
STANDARD:	Turbine runback at maximum rate is attempted by depressing the following pushbuttons on the EH Turbine Control Panel: • LIMIT ⇓ OR • GV ⇓ AND GV FAST	____ SAT ____ UNSAT
COMMENTS:		
STEP 13:	IF Turbine can NOT be run back, THEN verify CLOSED the following: (Step 2.c RNO) • All MSIVs • All MSIV BYPs	**CRITICAL STEP**
STANDARD:	RTGB control switches taken to the CLOSED position for: • MSIVs (V1-3A, B, C) • MSIV Bypasses (MS-353-A, B, C)	____ SAT ____ UNSAT
EXAMINER'S CUE:	**After the operator states Immediate Actions are complete, terminate the JPM.**	
COMMENTS:		
	END OF TASK	

TIME STOP: ________ **TIME CRITICAL STOP TIME:** ___________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place an Excore Nuclear Instrumentation Channel in and out of service IAW OWP-011
015*004*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-009.a
RO / SRO

K/A Rating(s):

015 A4.02 3.9/3.9
015 A4.03 3.8/3.9

Task Standard:

Respond to a Power Range N-44 Failure and remove it from service IAW with OWP-011, NI-4

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ Perform __X__ Simulate ______

References:

AOP-001, Malfunction of Reactor Control System
OWP-011, NI-4

Validation Time: 20 min. **Time Critical: NO**

Candidate: ______________________________ Time Start: ______
NAME Time Finish: ______

Performance Rating: SAT ______ UNSAT ______ Performance Time: ______

Examiner: ________________________ __________________________/______
NAME SIGNATURE DATE

COMMENTS

Step 2
Critical because entry conditions for AOP-001 are satisfied

Step 4
Critical because operator action is required to stop unwarranted rod motion (immediate action)

Step 12
Critical because procedure transition to OWP-011, NI-4 is required to remove NI-44 from service

Step 18
Critical because operator action is required to bypass the NI-44 Dropped Rod signal

Step 20
Critical because operator action is required to place the NI-44 Power Range High Flux Trip in the tripped condition

Step 22, 23, 24
Critical because operator action is required to defeat NI-44 from the Rod Stop and QPTR circuitry

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-5, go to RUN ensure plant conditions are stable.
2. Place the simulator in FREEZE.
3. Place simulator in RUN when directed by the examiner.
4. Once the operator has taken the shift, insert malfunction **IMF NIS08D (None 0 0) 125 5:00 AsIs**

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

AOP-001, Malfunction of Reactor Control System
OWP-11, NI-4.

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant is at 100% power
2. No equipment is out of service
3. You are the Reactor Operator

INITIATING CUES:

You are to respond to events as they occur.

START TIME: _______

STEP 1: Operator observes inward rod motion is in progress. STANDARD: Operator determines unwarranted rod motion and transitions to AOP-001. **EXAMINER'S NOTE: The first alarms will be:** **APP-005-C3, PR CHANNEL DEV** **APP-005-B4, PR OVERPOWER ROD STOP** COMMENTS:	____ SAT ____ UNSAT

NOTE: Steps 1 through 4 are immediate actions.

STEP 2: Check Unwarranted Rod Motion - IN PROGRESS (AOP-001, Step 1) STANDARD: Operator determines unwarranted rod motion is in progress. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 3: Check Reactor Power - GREATER THAN 15% (AOP-001, Step 2) STANDARD: Operator determines reactor power is greater than 15% COMMENTS:	____ SAT ____ UNSAT
STEP 4: Attempt To Stop Rod Motion As Follows: (AOP-001, Step 3) a. Check ROD BANK SELECTOR Switch position - A (AUTO) b. Place ROD BANK SELECTOR Switch in M (Manual) STANDARD: Operator places the Rod Bank Selector Switch in Manual COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 5: Check Unwarranted Rod Motion - STOPPED (AOP-001, Step 4) STANDARD: Operator determines rod motion has stopped COMMENTS:	____ SAT ____ UNSAT
STEP 6: Go To Section C, Continuous Rod Motion (AOP-001, Step 5) STANDARD: Operator transitions to Section C COMMENTS:	____ SAT ____ UNSAT
STEP 7: Check ROD BANK SELECTOR Switch Position When Problem Occurred - INDIVIDUAL BANK SELECT (AOP-001, Section C, Step 1) STANDARD: Operator determines the ROD BANK SELECTOR Switch was not in Individual Bank Select and goes to Step 4 via the RNO. COMMENTS:	____ SAT ____ UNSAT
STEP 8: Stop Any Boron Dilution In Progress (AOP-001, Section C, Step 4) STANDARD: Operator determines there is no dilution in progress COMMENTS:	____ SAT ____ UNSAT
STEP 9: Check APP-005-B5, ROD BANKS A/B/C/D LO LIMIT - EXTINGUISHED (AOP-001, Section C, Step 5) STANDARD: Operator determines APP-005-B5 is extinguished. COMMENTS:	____ SAT ____ UNSAT

<u>STEP 10</u>: Check Reactor Power - LESS THAN <u>OR</u> EQUAL TO 100% (AOP-001, Section C, Step 6) <u>STANDARD</u>: Operator determines reactor is < 100% power. <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 11</u>: Check Rod Bank Selector Switch Position - AUTO (AOP-001, Section C, Step 7) <u>STANDARD</u>: Operator determines the Rod Bank Selector Switch is not in Auto and goes to Step 7 RNO. <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 12</u>: Perform the following: (AOP-001, Section C, Step 7 RNO) a. Maintain Tavg within +0.5 to -2.5 °F of Tref using Manual Rod Control. b. IF Manual Rod Control will NOT function, THEN adjust Turbine load. c. IF N-44 has failed, THEN remove the failed channel from service using OWP-011, Nuclear Instrumentation. <u>STANDARD</u>: Operator transitions to OWP-011, Nuclear Instrumentation. **EXAMINER CUE: Another operator will maintain Tavg / Tref within band.** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 13</u>: Obtain a copy of OWP-011, NI-4. <u>STANDARD</u>: Operator obtains a copy of OWP-011, NI-4. **EXAMINER CUE: Hand the operator a copy of OWP-011, NI-4 once he/she locates it.** <u>COMMENTS</u>:	____ SAT ____ UNSAT

STEP 14: Review Precaution section on Page 1 (OWP-11, NI-4, page 1) STANDARD: Operator reviews precautions associated with removing NI-44 from service **EXAMINER CUE: If operator requests CRSS/SSO review Technical Specifications, acknowledge as the CRSS/SSO.** COMMENTS:	____ SAT ____ UNSAT
STEP 15: Remove NI-44 from ERFIS scan: NIN0044A** (Page 3, 1st Step) STANDARD: NI-44 removed from ERFIS scan, and initialed **EXAMINER CUE: The STA will remove NI-44 from ERFIS scan** COMMENTS:	____ SAT ____ UNSAT
STEP 16: NIS CHANNEL SELECTOR NR 45 PEN 1 and 2*** (2nd & 3rd Step) STANDARD: On the RTGB, the Channel Selector switches for the NR-45 Recorder Pens selected to any other NI (1 PR, 1 IR) NOT removed from service and recorded / initialed COMMENTS:	____ SAT ____ UNSAT
STEP 17: 1/QM-408 Switch (in Rack No. 28): POWER MISMATCH DEFEATED (4th Step) STANDARD: 1/QM-408 Switch (in Rack No. 28) selected to DEFEAT **EXAMINER'S CUE: When operator determines Key #10 is required, inform him/her that Power Mismatch 1/QM-408 has been defeated and verified** COMMENTS:	____ SAT ____ UNSAT

STEP 18: DROPPED ROD MODE Switch: BYPASS (5th Step) STANDARD: On NI-44, NI-44 DROPPED ROD MODE Switch selected to BYPASS **EXAMINER NOTE: APP-005-D4, NIS TRIP/DROP ROD BYPASS alarms when switch is taken to bypass** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 19: NIS ROD DROP BYPASS NI-44 Status Light: ILLUM (6th Step) STANDARD: Operator determines the NIS ROD DROP BYPASS NI-44 Status Light is illuminated COMMENTS:	____ SAT ____ UNSAT
STEP 20: NI-44 OUT OF SERVICE TRIP SWITCH: TRIPPED (7th Step) STANDARD: In the back of the NI-44 cabinet, the operator positions the NI-44 OUT OF SERVICE TRIP SWITCH to the TRIPPED position. Operator determines verification is not required due to the bistable light not being lit prior to positioning NI-44 OUT OF SERVICE TRIP SWITCH **EXAMINER'S NOTE: This defeats the Power Range High Flux Trip** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 21: Bistable Light HI POW RANGE HI FLUX NC44R: ILLUM (8th Step) STANDARD: Operator determines Bistable Light HI POW RANGE HI FLUX NC44R is illuminated. COMMENTS:	____ SAT ____ UNSAT

STEP 22: ROD STOP BYPASS Switch: BYPASS PR 44 (9th Step) STANDARD: On the Miscellaneous Control & Indication Panel , the operator places the ROD STOP BYPASS Switch to the BYPASS PR 44 position. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 23: COMPARATOR CHANNEL DEFEAT Switch: SELECT PR 44 (10th Step) STANDARD: On the Miscellaneous Control & Indication Panel, the operator places the COMPARATOR CHANNEL DEFEAT Switch to the SELECT PR 44 position COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 24: DETECTOR CURRENT COMPARATOR DRAWER: UPPER and LOWER SECTION Switch: SELECT PR 44*** (11th Step) STANDARD: On the DETECTOR CURRENT COMPARATOR DRAWER, the operator selects PR 44 with the Upper and Lower Section switches. COMMENTS: Acceptable to not defeat if applicant verifies that QPTR inputs are valid. MTE 8/24/99	**~~CRITICAL STEP~~** ____ SAT ____ UNSAT
STEP 25: NI-44 INSTRUMENT POWER FUSES**: REMOVED (12th Step) STANDARD: Operator determines this step is not required. **EXAMINER'S NOTE: This action is N/A if power is > P-10 or the reactor is in MODES 3 through 6 (ITS Table 3.3.1-1)** COMMENTS:	____ SAT ____ UNSAT

STEP 26: Bistable Light LOW POW RANGE HI FLUX NC44P: ILLUM (13th Step) STANDARD: Operator determines this step is not required. **EXAMINER'S NOTE: This bistable is normally in the tripped condition (illuminated) at this power level. The operator may initial this step accordingly.** COMMENTS: **END OF TASK**	____ SAT ____ UNSAT

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Respond to a PZR Pressure Control Malfunction.
000*027* 05*01

Alternate Path:

CVC-311 failed open, must isolate normal charging to stop RCS depressurization

Facility JPM #:

JPM CR-035
RO \ SRO

K/A Rating(s):

027 AK3.03	3.7/4.1
027 AA2.04	3.7/4.3
027 AA2.02	3.8/3.9

Task Standard:

The Operator will be required to respond to a PZR CONTROL HI/LO PRESS alarm, perform actions of AOP-019, and identify valve CVC-311 as the cause of depressurization.

Preferred Evaluation Location: Simulator __X__ In-Plant ______

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

AOP-019, MALFUNCTION OF RCS PRESSURE CONTROL

Validation Time: 15 min. **Time Critical: No**

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ______________________ ______________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 13
Critical because the operator must determine CVC-311 being failed open is the cause of the unanticipated RCS pressure decrease

Step 15
Critical because operator action is required to secure normal letdown

Step 17
Critical because operator action is required to reduce charging flow to minimum

Step 18
Critical because closing HCV-121 (without exceeding the Charging Pump Relief setpoint) stops the RCS pressure decrease

Step 22
Critical because operator action is required to open CVC-387

Step 23
Critical because operator action is required to open HIC-137 (without exceeding 195°F)

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-216 and activate CAEP 88_JPM_CR_035_R8
2. Otherwise initialize to IC-5 and perform the following:
   a. MFP PRS05A (None 0 0) 0, Pzr B/U Htr GP A - OFF
   b. MFP PRS05B (None 0 0) 0, Pzr B/U Htr GP B - OFF
   c. MFP CVC18 (None 0 0) 100, Fail CVC-311(Aux Spray Valve) to full open
   d. Place simulator in RUN
   e. Start a second charging pump and open CVC-200B
   f. When APP-003-D8 alarms, close CVC-200B, stop one charging pump
   g. Override Annunciator APP-003-D8 OFF, then place simulator in FREEZE
3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

APP-003-D8
AOP-019

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

You are the Unit 2 Control Operator

Plant is at 100% power

No equipment is out of service

INITIATING CUES:

You are to respond to events as they occur.

START TIME: ______

EXAMINER'S NOTE: **Annunciator APP-003-D8 will alarm ~10 seconds after the simulator is placed in RUN**

Operator may directly enter AOP-019 and perform the Immediate Actions without consulting APP-003-D8.

	APP-003	
STEP 1:	Operator refers to APP-003-D8.	
STANDARD:	Operator checks possible causes and determines entry into AOP-019 is required. 1. Plant transient **(NONE)** 2. Pressure Controller Malfunction/Spray Valve failure **(MAY OBSERVE AUX SPRAY VALVE OPEN)** 3. Transmitter failure (PT-445) **(RESPONDING NORMALLY)** 4. Excessive RCS leakage (low) **(NONE)** Observes: 1. Pressurizer Pressure (PI-444, PI-445, PI-455, PI-456 and PI-457) 2. PC-444J output 3. Generator Load/Reactor Power 4. Spray Valve Position **(MAY OBSERVE AUX SPRAY VALVE OPEN)** Actions: 1. IF Pressure Controller OR Spray Malfunction, THEN Refer To AOP-019	____ SAT ____ UNSAT
COMMENTS:		

NOTE: AOP-019, Steps 1 and 2 are Immediate Action steps.

STEP 2: Determine If PZR PORVs Should Be Closed. (Step 1) a. Check PZR pressure - LESS THAN 2335 PSIG. b. Verify Both PZR PORVs - CLOSED STANDARD: Operator determines PZR Pressure is less than 2335 PSIG. Operator verifies both PZR PORVs closed by observing the green lights illuminated for PCV-455C and 456. **EXAMINER'S NOTE: The operator may observe PRT parameters. (Possible leaking PORV)** COMMENTS:	____ SAT ____ UNSAT
STEP 3: Control The PZR SPRAY VALVES AND PZR Heaters To Restore RCS Pressure To The Desired Control Band. (Step 2) STANDARD: Operator determines: • PZR spray valves are closed by observing the green lights illuminated for PCV-455A and 455B • Control and both Backup heater groups on by observing the red lights illuminated above the RTGB control switches **EXAMINER'S NOTE: Operator may observe the Auxiliary Spray valve open by observing the red light illuminated above the RTGB control switch for CVC-311.** **After the operator performs Steps 1 and 2, hand him / her a copy of AOP-019.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: Check PZR Pressure - UNDER OPERATOR CONTROL (Step 3) STANDARD: Operator determines PZR Pressure is NOT under operator control. COMMENTS:	____ SAT ____ UNSAT

STEP 5:	IF PZR Pressure approaches a Reactor Trip Setpoint, THEN trip the Reactor and Go To Path-1. (Step 3 RNO) • Low PZR Pressure - 1844 psig • High PZR Pressure - 2376 psig • OTΔT - Variable (TR-412)	____ SAT
STANDARD:	Operator determines Pressurizer pressure is not approaching a reactor trip setpoint.	____ UNSAT
COMMENTS:		
STEP 6:	Check PC-444J, PZR PRESS - OPERATING PROPERLY IN AUTO (Step 4)	
STANDARD:	Operator determines PC-444J is operating properly in auto.	
COMMENTS:		____ SAT ____ UNSAT
STEP 7:	Go To Step 8 (Step 5)	
STANDARD:	Operator proceeds to Step 8.	
COMMENTS:		
STEP 8:	Check RCS pressure - LESS THAN REQUIRED FOR CURRENT PLANT CONDITIONS (Step 8)	
STANDARD:	Operator determines RCS pressure less than required.	____ SAT
EXAMINER'S NOTE:	**RCS pressure indicates ~ 2180 psig and slowly decreasing**	
COMMENTS:		____ UNSAT

STEP 9: Check PZR Pressure - LESS THAN 2205 PSIG (Step 9) STANDARD: Operator determines PZR Pressure is less than 2205 psig **EXAMINER'S NOTE: PZR pressure indicates ~ 2170 psig** COMMENTS:	____ SAT ____ UNSAT
STEP 10: Restore Pressure Within 2 HOURS OR Be In Mode 2 Within 6 HOURS (Step 10) STANDARD: Operator acknowledges requirement to restore pressure within 2 hours or be in Mode 2 within 6 hours **EXAMINER CUE: Respond as the CRSS/SSO acknowledging 2 hour Technical Specification action.** COMMENTS:	____ SAT ____ UNSAT
STEP 11: Check Both PZR SPRAY VALVES - CLOSED (Step 11) STANDARD: Operator determines both PZR Spray Valves closed by observing the green lights illuminated for above the RTGB control switches COMMENTS:	____ SAT ____ UNSAT
STEP 12: Observe The CAUTION Prior To Step 17 and Go To Step 17 (Step 12) STANDARD: Operator proceeds to Step 17 COMMENTS:	

CAUTION: With HCV-121, CHARGING FLOW Valve closed, throttling Seal Injection Flow will cause the Charging Pump Relief Valves to lift.

STEP 13: Check CVC-311, AUX PZR SPRAY Valve - CLOSED (Step 17) STANDARD: Operator determines CVC-311 is open by observing the Red light illuminated above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 14: Verify CVC-311 Control Switch is SELECTED TO CLOSE (Step 17 RNO) STANDARD: Operator verifies CVC-311 control switch is in the CLOSED position COMMENTS:	____ SAT ____ UNSAT
STEP 15: Close CVC-460A AND CVC-460B, LTDN LINE STOP (Step 17.a RNO) STANDARD: Operator places the control switch for CVC-460A and CVC-460B in the close position and verifies the valves are closed by observing the green lights illuminated above the RTGB control switch **EXAMINER'S NOTE: CVC-460A & B are controlled by the same RTGB control switch.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 16: Verify only one charging pump is RUNNING (Step 17.b RNO) STANDARD: Operator determines only one charging pump is running COMMENTS:	____ SAT ____ UNSAT

STEP 17:	Place running charging pump controller in MAN and adjust to minimum speed (Step 17.c RNO)	**CRITICAL STEP**
STANDARD:	Operator places the controller for the "C" Charging Pump in manual and adjusts demand to 0 speed	____ SAT
COMMENTS:		____ UNSAT
STEP 18:	Close HCV-121, CHARGING FLOW Valve by slowly adjusting controller HIC-121 to 100% demand while maintaining Charging Pump Discharge pressure less than 2500 PSIG (Step 17.d RNO)	**CRITICAL STEP**
STANDARD:	HCV-121 adjusted to 100% demand by rotating the potentiometer in the clockwise direction and observing HCV-121 demand meter while maintaining Charging Pump Discharge pressure (PI-121) < 2500 psig	____ SAT
EXAMINER'S NOTE:	**HCV-121 operation ... 0% - open - counter-clockwise 100% - closed - clockwise Charging pump discharge pressure remains at ~ 2250 psig**	____ UNSAT
COMMENTS:		
STEP 19:	Perform Attachment 2, Placing Excess Letdown In Service (Step 17.e RNO)	
STANDARD:	Operator proceeds to Attachment 2	____ SAT
EXAMINER'S CUE:	**CRSS directs you to perform Attachment 2**	
COMMENTS:		____ UNSAT

STEP 20: Verify CC-739, CCW FROM EXCESS LTDN HX - OPEN (Attachment 2, Step 1) STANDARD: Operator determines CC-739 is open by observing red light illuminated above the RTGB control switch COMMENTS:	____ SAT ____ UNSAT
STEP 21: Verify CVC-389, EXCESS LTDN DIV, - IN THE DRN TK POSITION (Step 2) STANDARD: Operator determines CVC-389 is in the DRAIN TANK position by observing the white light illuminated at the RTGB control switch COMMENTS:	____ SAT ____ UNSAT
STEP 22: Open CVC-387, EXCESS LTDN STOP (Step 3) STANDARD: Operator opens CVC-387 by placing the control switch to open and observing red light illuminated above the control switch COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

CAUTION: IF Excess Letdown Heat Exchanger outlet temperature exceeds 195°F, THEN damage could result.

STEP 23: Slowly open HIC-137, EXCESS LTDN FLOW (Step 4) STANDARD: Operator slowly adjusts the potentiometer for HIC-137 in the open (clockwise) direction while observing Excess Letdown Heat Exchanger outlet temperature on TI-139 **EXAMINER'S NOTE: HIC-137 adjusted to ~80% demand will cause temperature on TI-139 to be ~195°F** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 24: Check Excess Letdown Heat Exchanger Outlet Temperature - GREATER THAN 195°F (Step 5) STANDARD: Operator determines TI-139 < 195°F and proceeds to Step 7 **BOOTH INSTRUCTOR'S CUE: When called, acknowledge the Waste Disposal Panel alarm. Report RCDT Hi level, "B" RCDT Pump running in automatic.** COMMENTS:	____ SAT ____ UNSAT

NOTE: PZR level will increase if total Charging flow exceeds total Letdown flow AND RCP Seal Leakoff flow.

STEP 25: Check PZR Level - INCREASING (Step 7) STANDARD: Operator determines PZR level is not increasing and proceeds to Step 10 (via the RNO) **EXAMINER'S NOTE: If operator determines PZR level is increasing, perform steps 8 and 9, (JPM Steps 26 and 27). Otherwise, go to step 10 (JPM Step 28)** COMMENTS:	____ SAT ____ UNSAT

<table>
<tr><td>

STEP 26: Verify The Running Charging Pump - AT MINIMUM SPEED (Step 8)

STANDARD: Operator determines "C" Charging Pump is in manual

COMMENTS:

</td><td>____ SAT

____ UNSAT</td></tr>
<tr><td>

STEP 27: Contact Chemistry To Purge The PZR Liquid Sample Line With Full Flow To The VCT Using CP-003, Systems Sampling Procedure (Step 9)

STANDARD: Operator requests control room supervision or contacts Chemistry to purge the PZR liquid sample line with full flow to the VCT per CP-003

EXAMINER CUE: If requested as control room supervision, acknowledge lining up the PZR liquid sample line to the VCT with full flow per CP-003.

BOOTH INSTRUCTOR CUE: If Chemistry is contacted, acknowledge lining up the PZR liquid sample line to the VCT with full flow per CP-003

COMMENTS:

</td><td>____ SAT

____ UNSAT</td></tr>
<tr><td>

STEP 28: Check PZR Level - GREATER THAN 63% (Step 10)

STANDARD: Operator determines PZR level < 63% by observing LI-459, 460, 461 and proceeds to Step 12 (via the RNO)

COMMENTS:

</td><td>____ SAT

____ UNSAT</td></tr>
<tr><td>

STEP 29: Check PZR Level - APPROACHING 91% (Step 12)

STANDARD: Operator determines PZR level is not approaching 91% and proceeds to Step 14 (via the RNO)

COMMENTS:

</td><td>____ SAT

____ UNSAT</td></tr>
</table>

<u>STEP 30</u>: Inform the CRSS That Excess Letdown Is In Service <u>AND</u> That Continuous Action Steps Are In Effect (Step 14)
 	
<u>STANDARD</u>: CRSS informed that Excess Letdown is in service and continuous action steps are in effect.
 	
EXAMINER'S CUE: Acknowledge that Excess Letdown is in service and continuous actions are in effect.
 	
EXAMINER'S NOTE: Continuous actions as follows:
• **If PZR level increases:**
  • **verify charging pump at minimum speed**
  • **contact Chemistry to purge the PZR liquid sample line with full flow to the VCT**
• **If PZR level > 63%, reduce to < 63% or be in Mode 3 with the Trip breakers open within 6 hours and be in Mode 4 within 12 hours**
• **If PZR level is approaching 91%, trip the reactor and go to PATH-1**
 	
<u>COMMENTS</u>:
	____ SAT
	
	____ UNSAT

<u>STEP 31</u>: Go to Step 26 (Step 17.f RNO) <u>STANDARD</u>: Operator proceeds to Step 26 <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 32</u>: Implement the EALs (Step 26) <u>STANDARD</u>: Operator informs the Superintendent Shift Operations to implement the EALs **EXAMINER'S CUE: Acknowledge as the Superintendent Shift Operations to implement the EALs** <u>COMMENTS</u>:	____ SAT ____ UNSAT

STEP 33: Contact I&C To Make Repairs To The PZR Pressure Control System (Step 27) STANDARD: Operator informs Control Room supervision to contact I&C for repairs to CVC-311 **EXAMINER'S CUE: Acknowledge as the Control Room supervision to contact I&C to make repairs to CVC-311** **BOOTH INSTRUCTOR CUE: If called, respond as I&C or the WCC SRO and acknowledge initiate repairs to CVC-311** COMMENTS:	____ SAT ____ UNSAT
STEP 34: Refer to ITS For Applicable LCOs (Step 28) • LCO 3.4.11, PZR PORV • TRM 3.4, PZR Spray ΔT • LCO 3.4.4 and 3.4.5, RCS Loops • LCO 3.4.1, RCS Pressure • LCO 3.4.9, PZR Level STANDARD: Operator informs Control Room supervision to refer to ITS / TRM **EXAMINER'S NOTE: Acknowledge as Control Room supervision or tell the operator that someone else will refer to ITS / TRM** COMMENTS: **END OF TASK**	____ SAT ____ UNSAT

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place the LTOP System in sevice when the RCS is >350°F IAW OP-006
002*018*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-039
RO / SRO

K/A Rating(s):

010 000 A4.03	4.0/3.8
010 000 GEN.9	3.6/3.5
010 000 GEN.13	3.5/3.7

Task Standard:

LTOP placed in service IAW OP-006, section 5.2

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OP-006, section 5.2

Validation Time: 20 min. **Time Critical:** NO

Candidate: ______________________________
NAME

Time Start : ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______

Performance Time: ________

Examiner: ________________________ __________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because Instrument Air must be isolated to satisfy stroke time surveillance requirement

Step 5
Critical because isolation of the PZR PORVs prior to stroking them prevents an undesirable RCS depressurization

Step 6
Critical because stroke open time affects PZR PORV(s) operability

Step 8
Critical because failure to close either PZR PORV would cause an undesirable RCS depressurization

Step 9 (RC-536 ONLY)
Critical because opening the PORV Block Valve is required to place LTOP in service

Step 10
Critical because placing the PZR PORV control switches in AUTO configures the circuitry for automatic actuation

Step 11
Critical because Instrument Air must be aligned for PZR PORV operability

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-23, activate CAEP 88_JPM_CR_039_R2
2. Go to RUN and allow conditions to stabilize, then go to FREEZE
3. Update Control Room Status Board to IC-23 Chemistry Sheet
4. Place simulator in RUN when directed by the examiner

SIMULATOR OPERATOR INSTRUCTIONS:

The CAEP has the following triggers included:

- E1 (88_JPM_CR_039): When PZR PORV PCV-456 switch is taken to the open position, the green closed light will extinguish 4 seconds later.

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-006, section 5.2.1 completed
Calibrated stop watch

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. A plant cooldown from hot shutdown to cold shutdown IAW GP-007 is to be performed.
2. RCS temperature is 548 °F and pressure is 2240 psig.
3. You are the Reactor Operator.
4. An Auxiliary Operator is standing by in the Containment awaiting instructions.

INITIATING CUES:

Place the Low Temperature Overpressure Protection system in service IAW OP-006, Section 5.2, beginning with step 5.2.2. Maintenance has not been performed on the Pressurizer PORV Pneumatic System.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-006. ***Hand the operator a calibrated stop watch and the copy of OP-006 (with section 5.2.1 completed).*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: IF maintenance has been performed on the PZR PORV Pneumatic System, THEN align system IAW Section 5.1 of this procedure. (Step 5.2.2.1) STANDARD: Operator marks this step N/A, no maintenance performed. COMMENTS:	____ SAT ____ UNSAT
STEP 3: Check PI-1726 & 1727 indicate between 95 and 99 psig. (Step 5.2.2.2, 3) STANDARD: Operator directs Auxiliary operator (AO) inside Containment (CV) to check pressure on PI-1726 & 1727 between 95 and 99 psig.. **BOOTH INSTRUCTOR'S CUE: When directed to check PI-1726 & 1727, report pressure for each indicates 98 psig.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: Close OPP-2 & 1, AIR SUPPLY (Step 5.2.2.4, 5) STANDARD: Operator directs AO inside CV to close OPP-2 & OPP-1. **BOOTH INSTRUCTOR'S CUE: When directed, report OPP-2 & 1 are closed.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

<u>STEP 5</u>: Close PORV Block Valves (Step 5.2.2.6.a. & b) a. RC-535 b. RC-536 <u>STANDARD</u>: RC-535 & 536 closed as indicated by illuminated green light only on the RTGB control switches. **EXAMINER'S NOTE: Annunciators APP-003-A3 and A2 will alarm due to RC-535 & 536 being closed.** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT

NOTE: Acceptance criteria for OPEN stroke time of PCV-455C and PCV-456 is 2.5 seconds.

<u>STEP 6</u>: Time open PCV-455C and PCV-456 (Step 5.2.2.7) <u>STANDARD</u>: One at a time, PCV-455C & 456 will be timed open by simultaneously activating the stop watch and positioning the RTGB control switch to the open position. When the Red light only is illuminated, the stop watch will be de-activated and the stroke time recorded in the procedure. **EXAMINER'S NOTE: Annunciator APP-003-D6 will alarm due to opening PCV-455C & 456.** **PCV-455C should be satisfactory** **PCV-456 should be unsatisfactory** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT

STEP 7: IF PCV-455C or PCV-456 do not meet acceptance criteria, THEN perform the following: (Step 5.2.2.8)
a. Declare the valve(s) not meeting the acceptance criteria inoperable
b. Perform the REQUIRED ACTIONS of ITS LCO 3.4.11 for an inoperable PORV
c. Write a work request for inoperable valve(s)
 	
STANDARD: Operator:
• determines stroke open time for PCV-456 is >2.5 seconds
• informs Control Room supervision
    • PCV-456 is inoperable
    • to perform required actions of ITS LCO 3.4.11
    • write a work request for PCV-456
 	
EXAMINER'S CUE: Acknowledge as the CR Supervisor that PCV-456 is inoperable and that the Work Control Center SRO will initiate a work request.
 	
Direct the operator to take action(s) per ITS 3.4.11
 	
EXAMINER'S NOTE: The operator may elect to complete the surveillance prior to referencing the Technical Specifications.
 	
COMMENTS:
	____ SAT
	
	____ UNSAT

STEP 8: Close Pressurizer Power Operated Relief Valves (Step 5.2.2.9) a. PCV-455C b. PCV-456 **STANDARD:** Operator positions control switches for PCV-455C & 456 to close and determines valves are closed by observing green light only illuminated on the RTGB control switches. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 9: Open PORV Block Valves (Step 5.2.2.10) RC-535 RC-536 STANDARD: RC-535 open as indicated by red light only illuminated on the RTGB control switch RC-536 open as indicated by red light only illuminated on the RTGB control switch **EXAMINER'S NOTE: The operator may open RC-535 until he/she references the ITS 3.4.11 at which time he/she has 1 hour to close the Block Valve associated with the inoperable PZR PORV.** **RC-536 open -critical step** COMMENTS:	**CRITICAL STEP (RC-536 ONLY)** ____ SAT ____ UNSAT
STEP 10: Return control switches for PZR PORVs to AUTO position. (Step 5.2.2.11) a. PCV-455C b. PCV-456 STANDARD: PCV-455C & 456 control switches positioned to AUTO. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 11: Open OPP-2, & 1. (Step 5.2.2.12, 13) STANDARD: Operator directs AO inside CV to open OPP-2 & OPP-1, AIR SUPPLY **BOOTH INSTRUCTOR'S CUE: When directed, report OPP-2 & 1 are open and independently verified.** **EXAMINER'S NOTE: If operator didn't reference the ITS earlier, he/she should reference now and determine RC-535 should remain closed with power applied (ITS 3.4.11 Condition A, Required Action A.1).** COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Transfer to Long Term Recirculation IAW EPP-10
000*210*R5*01

Alternate Path:

"B" RHR Pump trips when started.

Facility JPM #:

CR-061 (Rev. 2)
RO / SRO

K/A Rating(s):

006 A2.02	3.9/4.3
006 A4.01	4.1/3.9
006 A4.07	4.4/4.4
000 011 EA1.11	4.2/4.2

Task Standard:

Transfer to long term recirculation with "A" RHR Pump and both SI Pumps running.

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EPP-10, Transfer to Long Term Recirculation

Validation Time: 15 min. **Time Critical: NO**

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

COMMENTS

Step 3 ("A" RHR Pump ONLY)
Critical because the ECCS Pumps must be secured to prevent damage while changing flowpath / lineup.

Step 5
Critical because isolating RHR discharge flowpath required to align for "piggyback" mode

Step 6
Critical because RHR discharge must be supplied to the SI Pumps through the SI-863 valves

Step 7 (SI-870s and SI-866A ONLY)
Critical because alignment for Hot Leg recirculation is required to dissolve any boron precipitation on the top of the core.

Step 8
Critical because SI flow must be established to the Hot Legs

Step 10
Critical because procedure transition required to bypass steps placing cold leg recirculation in service due to failed RHR Pump.

Step 11 (SI-863B ONLY)
Critical because closing valve prevents "short circuit" of water back to RHR Pump suction.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-28, go to RUN
2. Insert malfunction **RHR01B (None 0 0)**
3. Place simulator in FREEZE.
4. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

EPP-10, Transfer to Long Term Recirculation

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant experienced a large break LOCA inside containment 11 hours ago.

2. You are the Reactor Operator.

INITIATING CUE:

The CRSS has directed you to place the RCS in long term recirculation IAW EPP-10, Transfer to Long Term Recirculation.

START TIME: _______

EXAMINER'S CUE: When operator locates procedure, hand him/her a copy of EPP-10. **STEP 1:** Open Foldout B (Step 1) **STANDARD:** Operator opens Foldout B **EXAMINER'S NOTE: The operator may read through the criteria on Foldout B. The RO and BOP operators normally follow along as the CRSS reads the criteria aloud.** **COMMENTS:**	___ SAT ___ UNSAT
STEP 2: Check SI-869, SI HOT LEG HDR - OPEN (Step 2) **STANDARD:** Operator determines SI-869 is open by observing the red open light illuminated. **COMMENTS:**	___ SAT ___ UNSAT
STEP 3: Verify the following pumps - ALL STOPPED (Step 3.a) • SI PUMPS • CV SPRAY PUMPS • RHR PUMPS **STANDARD:** Operator : • determines both SI Pumps, both CV Spray Pumps, and the "B" RHR Pump are stopped by observing the green off lights illuminated at their RTGB control switches. • positions "A" RHR pump control switch to STOP and observes the green off light illuminated. **EXAMINER'S NOTE: Stopping "A" RHR Pump is the only critical part of this step.** **COMMENTS:**	**CRITICAL STEP ("A" RHR Pump)** ___ SAT ___ UNSAT

STEP 4:	Verify CV SPRAY PUMP DISCH Valves - CLOSED (Step 3.b) • SI-880A • SI-880B • SI-880C • SI-880D	___ SAT ___ UNSAT
STANDARD:	Operator determines the CV Spray Pump Discharge valves are closed by observing the green shut light illuminated. • SI-880A • SI-880B • SI-880C • SI-880D	
COMMENTS:		
STEP 5:	Verify RHR HX DISCH Valves - CLOSED (Step 3.c) • RHR-759A • RHR-759B	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Operator positions the RHR HX Discharge Valve control switches to the closed position and observes the green shut light illuminated. • RHR-759A • RHR-759B	
COMMENTS:		
STEP 6:	Verify RHR LOOP RECIRC Valves - OPEN (Step 3.d) • SI-863A • SI-863B	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Operator positions the RHR Loop Recirc Valve control switches to the open position and observes the red open light illuminated. • SI-863A • SI-863B	
COMMENTS:		

CAUTION: Opening SI-866A AND SI-866B, HOT LEG INJs, with only one SI Pump running will cause pump runout.

STEP 7: Verify the Following Valves Aligned for Hot Leg Recirculation (Step 4.a. b. c.) a. BIT OUTLET Valves - CLOSED • SI-870A • SI-870B b. SI-869, SI HOT LEG HDR - OPEN c. SI-866A, LOOP 3 HOT LEG INJ - OPEN **STANDARD:** Operator: • closes SI-870A & B and observes the green shut light illuminated • determines SI-869 open by observing the red open light illuminated • opens SI-866A and observes the red open light illuminated **EXAMINER'S NOTE: Closing SI-870A & B and opening SI-866A are the critical parts of this step.** **COMMENTS:**	**CRITICAL STEP (SI-870A, SI-870B, SI-866A)** ___ SAT ___ UNSAT

CAUTION: Valves RHR-759A and RHR-759B, RHR HX DISCHs, are closed. The RHR Pumps will run dead-headed and are subject to damage until the SI Pumps are started.

NOTE: The RHR Pump started below must have its associated SI-863 valve open to assure a flow path to the SI Pumps.

STEP 8: Establish Hot Leg Recirculation as Follows: (Step 5.a. b. c. d.) a. Start one RHR PUMP b. Start two SI PUMPs c. Check indicated flow on the appropriate flow meters d. Check flow status - FLOW INDICATED **STANDARD:** a., b. The operator positions the control switch to start for either RHR Pump and observes the red running light illuminated. "A" and "C" SI Pumps and observes the red running lights illuminated c. The operator observes indicated flow on FI-940 and 932 d. Operator determines flow indicated and proceeds to step 6. **EXAMINER'S NOTE: The "B" RHR Pump will trip as soon as it is started. If the operator elects to start it first, he should determine it tripped and start the "A" RHR Pump.** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 9: Determine if Flow Should Be Established To Cold Legs As Follows: (Step 6.a.b.) a. Check RCS pressure - LESS THAN 125 PSIG b. Check FI-605, RHR TOTAL FLOW - OPERABLE **STANDARD:** a. Operator determines RCS pressure is less than 125 psig b. Operator determines FI-605 is operable **COMMENTS:**	___ SAT ___ UNSAT
STEP 10: Align For Cold Leg Injection As Follows: (Step 7.a.b.) a. Establish communications with operators stationed at the breakers for RHR HEAT EXCHANGER OUTLETs • RHR-759A (MCC-5, CMPT 14C) • RHR-759B (MCC-6, CMPT 13C) b. Start the second RHR PUMP **STANDARD:** Operator determines the "B" RHR Pump cannot be started and transitions to Step 17 per the RNO. **BOOTH INSTRUCTOR CUE: Respond as AOs when called and report standing by at MCC-5 & 6** **EXAMINER'S NOTE: The operator may attempt a second start on the "B" RHR Pump.** **COMMENTS:**	**CRITICAL STEP (Transition to Step 17)** ___ SAT ___ UNSAT
STEP 11: Establish SI Pump Injection: (Step 17.a.b.) a. Check RHR PUMP A - RUNNING b. Close SI-863B **STANDARD:** Operator: a. determines "A" RHR Pump is running by observing the red running light illuminated. b. closes SI-863B by placing it's control switch in the close position and observing the green closed light illuminated. **EXAMINER'S NOTE: Closing SI-863B is the critical part of this step.** **COMMENTS:**	**CRITICAL STEP (Close SI-863B)** ___ SAT ___ UNSAT

STEP 12: Establish Hot Leg Injection As Follows: (Step 18.a.b.c.) a. Verify SI-869, SI HOT LEG HDR - OPEN b. Verify at least one HOT LEG INJ Valve - OPEN • SI-866A OR • SI-866B c. Verify BIT OUTLETs - CLOSED • SI-870A • SI-870B **STANDARD:** Operator determines: a. SI-869 is open by observing the red open light illuminated b. SI-866A is open by observing the red open light illuminated c. SI-870A and B are closed by observing the green shut light illuminated **EXAMINER'S NOTE: These valves were positioned earlier in this procedure.** **COMMENTS:**	___ SAT ___ UNSAT
STEP 13: Check Time Since Hot Leg Flow Established - 16 HOURS (Step 19) **STANDARD:** Operator answers NO, and per Step 19 RNO, determines that procedure progression is on hold until 16 hours has elapsed. **EXAMINER CUE: End of JPM.** **COMMENTS:** **END OF TASK**	___ SAT ___ UNSAT

STOP TIME: ________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

ESTABLISH RCS BLEED AND FEED (ONE PORV) IAW FRP-H.1
311*006*R6*01

Alternate Path:

1 PZR PORV will not open

Facility JPM #:

JPM CR-071
RO / SRO

K/A Rating(s):

002 000 A2.04   4.3/4.6

Task Standard:

RCS bleed and feed has been established by completion of FRP-H.1 up through and including establishing an RCS bleed path.

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

FRP-H.1, Response to Loss of Secondary Heat Sink

Validation Time: 12 min.   **Time Critical: YES (8 min.)**

Candidate: ______________________
NAME

Overall Time
Time Start : ________
Time Finish: ________

Critical Time
Start: __________
Finish: __________

Performance Time (min): __________   __________

Examiner: ______________________   ______________________/________
NAME   SIGNATURE   DATE

COMMENTS

Steps 5 through 14
Time Critical because Heat Sink must be established in a timely manner to prevent core damage.

Step 4
Critical because operator action is required to stop the RCPs (unnecessary heat input to the RCS)

Step 5
Critical because operator action is required to initiate SI

Step 10
Critical because IA is needed to operate the PZR PORVs

Step 11
Critical because operator action is required to establish a vent path for PZR

Step 12
Critical because BOTH PORVs must be open to provide adequate bleed path.

Step 13
Critical because operator action is required to open the Head Vent Valves (adequate bleed path with 1 PORV inoperable)

Step 14
Critical because operator action is required to depressurize at least 1 intact S/G (depressurize RCS < SI Pump shutoff head)

SIMULATOR OPERATOR INSTRUCTIONS:

Initialize the simulator to IC-217 and go to RUN.

Otherwise reset simulator to IC-5, go to RUN, and perform the following:

- Insert malfunction RPS1A and RPS1B failure to trip - Auto Only
- Activate MFI CFW-19 (total loss of feedwater).
- When SG WR levels <45% then manually trip the reactor
- Activate MFI PRS03C (None 0 0) 0 PCV-456 Fail Closed
- Verify 2 charging pumps Running
- Freeze the simulator after SG WR levels are less than 26%

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

FRP-H.1, Response to Loss of Secondary Heat Sink

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant was initially at 100% power.
2. Loss of both main feedwater pumps caused reactor and turbine trip
3. Unavailability of AFW pumps has led to a "RED" condition on heat sink CSFST
4. You are the Reactor Operator.

INITIATING CUES:

The CRSS has directed you to perform actions IAW FRP-H.1, Response To Loss Of Secondary Heat Sink.

START TIME: _______

CAUTION: Feed flow is not re-established to any faulted S/G if an intact S/G is available.

STEP 1:	Check Total Feed Flow - LESS THAN 300 GPM DUE TO OPERATOR ACTION (Step 1)	___ SAT ___ UNSAT
STANDARD:	Operator determines total feed flow < 300 gpm and not due to operator action, proceeds to Step 3 (via the RNO).	
COMMENTS:		
STEP 2:	Determine If Secondary Heat Sink Is Required As Follows: (Step 3) a. Check RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE. b. Check RCS temperature - GREATER THAN 350°F [310°F]	___ SAT ___ UNSAT
STANDARD:	Operator determines: a. RCS pressure is greater than non-faulted S/G pressure. b. RCS temperature is greater than 350°F.	
COMMENTS:		
STEP 3:	Check Any Two S/G Wide Range Levels - LESS THAN 26% [37%] (Step 4)	___ SAT ___ UNSAT
STANDARD:	Operator identifies that all 3 S/G Wide Range levels are less than 26%	
COMMENTS:		

STEP 4:	Perform The Following: (Step 5) a. Stop all RCPs b. Observe CAUTION prior to Step 28 and Go To Step 28	**CRITICAL STEP**
STANDARD:	Operator: a. Places control switches for A, B, and C RCPs to STOP, observes breakers open by observing the illuminated green lights above the control switches b. Proceeds to Step 28 and acknowledges CAUTION	___ SAT ___ UNSAT
COMMENTS:		

CAUTION: Steps 28 though 35 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.

TIME CRITICAL START TIME: ________

STEP 5:	Initiate SAFETY INJECTION As Follows: (Step 28) a. Depress the INITIATE SAFETY INJECTION Pushbutton b. Note the time SI initiated	**CRITICAL STEP**
STANDARD:	Operator: a. Depresses either INITIATE SAFETY INJECTION Pushbutton b. Notes the time SI initiated	__ SAT ___ UNSAT
COMMENTS:	**Record SI Initiated Time: _______**	

STEP 6: Verify RCS Injection Path As Follows: (Step 29) a. Verify SI Pumps - AT LEAST ONE RUNNING b. Verify SI Valves for at least one flow path - ALIGNED FOR COLD LEG INJECTION STANDARD: Operator observes: a. "A" and "B" SI pumps running by observing the red breaker closed lights illuminated above the control switches b. SI-870 "A" and/or "B" open by observing the red open light above the control switches **EXAMINER'S NOTE: The operator may observe all SI valves aligned as required using the SI Status lights on the RTGB.** COMMENTS:	___ SAT ___ UNSAT
STEP 7: Check Time Elapsed Since SI Initiation - 2 MINUTES (Step 30) STANDARD: Operator determines < 2 minutes have elapsed since SI initiation and proceeds to Step 33 (via the RNO) **EXAMINER'S NOTE: When at least 2 minutes have elapsed since the time recorded in JPM Step 5, the operator will come back to JPM Steps 8 and 9 to reset SI, CV Spray, Phase A & B.** **Go to JPM Step 10 (Step 33)** COMMENTS:	___ SAT ___ UNSAT
STEP 8: Reset the Following: (Step 31) • SAFETY INJECTION • CONTAINMENT SPRAY STANDARD: Operator depresses: • SAFETY INJECTION RESET Pushbutton • CONTAINMENT SPRAY RESET Pushbutton COMMENTS:	___ SAT ___ UNSAT

STEP 9:	Reset The Following Containment Isolations: (Step 32) a. PHASE A b. PHASE B	
STANDARD:	Operator depresses: a. PHASE A RESET Pushbutton b. PHASE B RESET Pushbutton	___ SAT
COMMENTS:		___ UNSAT
STEP 10:	Establish Instrument Air To CV As Follows: (Step 33) a. Verify APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED b. Place IA PCV-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position	**CRITICAL STEP**
STANDARD:	Operator: a. Verifies APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED b. Places IA PCV-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position	___ SAT
COMMENTS:		___ UNSAT
STEP 11:	Establish RCS Bleed Path As Follows: (Step 34) a. Verify power to PZR PORV Block Valves - AVAILABLE. b. Place all PZR Heater Control Switches to the OFF position c. Verify PZR PORV Block Valves - BOTH OPEN d. Open both PZR PORVs	**CRITICAL STEP** ___ SAT
STANDARD:	Operator: a. Identifies power is available to PZR PORV Block Valves by observing red open indication lights illuminated b. **Places all PZR Heater Control Switches to the OFF position** c. Determines PZR PORV Block Valves open by observing red open indication lights above illuminated d. **Opens both PZR PORVs**	___ UNSAT
EXAMINER'S NOTE:	**Only b. and d. (above) are critical steps** **The operator should observe PZR PORV PCV-456 does not open**	
COMMENTS:		

STEP 12:	Verify Adequate RCS Bleed Path As Follows: (Step 35) • PZR PORVs - BOTH OPEN • PZR PORV Block Valves - BOTH OPEN	**CRITICAL STEP**
STANDARD:	Operator: • Determines PZR PORV PCV-456 is not open by observing the green shut light illuminated above the control switch • Determines PZR PORV Block Valves are both open by observing the red open light illuminated above their control switches • Acknowledges NOTE prior to step 37 and goes to step 37 (via the RNO)	___ SAT ___ UNSAT
COMMENTS:		

NOTE: Key numbers 81 through 86 are required to operate the Head and PZR Vent Valves below.

STEP 13:	Place the Key Switches for the following Vent Valves to the OPEN Position: (Step 37) • RC-568, HEAD VENT • RC-570, PZR VENT • RC-572, CV ATMOS • RC-567, HEAD VENT • RC-569, PZR VENT • RC-571, PRT ISO	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Operator inserts the keys and places key switches for the following Vent Valves to the OPEN position and observes the red open light illuminated for each: • RC-568, HEAD VENT • RC-570, PZR VENT • RC-572, CV ATMOS • RC-567, HEAD VENT • RC-569, PZR VENT • RC-571, PRT ISO	
EXAMINER'S NOTE: Sequence is not dependent for acceptable performance (i.e., insert all keys prior to opening valves, or insert each key and open each valve)		
COMMENTS:		

STEP 14:	Depressurize At Least One Intact S/G To Atmospheric Pressure Using Steam Line PORVs (Step 38)	**CRITICAL STEP**
STANDARD:	Operator opens at least 1 S/G PORV by adjusting the potentiometer in the clockwise direction	___ SAT
EXAMINER CUE:	**End of JPM**	
COMMENTS:		___ UNSAT
	END OF TASK	

TIME STOP: ________ **TIME CRITICAL STOP TIME:** _________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Initiate Excess Letdown IAW OP-301
004*017*R1*01

Alternate Path:

N/A

Facility JPM #:

CR-097.a, Respond to a Leak in the Non-Regenerative Heat Exchanger, Place Excess Letdown in Service to the Volume Control Tank
RO / SRO

K/A Rating(s):

004 A1.07 2.7/3.1
004 A1.08 2.7/2.9
004 A1.11 3.0/3.0
004 A4.05 3.6/3.1

Task Standard:

Excess letdown flow established to the VCT IAW 301-1, Section 8.4.12

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant _____ Perform __X__ Simulate _____

References:

APP-001-A4, CCW Surge Tank Hi/Lo Level
APP-036-D8, Process Monitor Hi Rad
AOP-005, Radiation Monitoring System
AOP-014, Component Cooling Water System Malfunction
OP-301-1,

Validation Time: 20 min. **Time Critical: No**

Candidate: ____________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ________________________ ________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because transition to AOP-005 is required

Step 7
Critical because transition to AOP-014 is required

Step 16
Critical because letdown isolation stops the RCS leak

Step 26
Critical because operator action is required to establish Excess Letdown

Step 27
Critical because deliberate operation is required to open HCV-137 without exceeding 195°F

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-5, go to RUN then place in FREEZE.
2. Place simulator in RUN when directed by the examiner.
3. Insert 30 gpm NRHX leak malfunction **IMF CVC11 (None 0 0) 30 0 AsIs**

Tools/Equipment/Procedures Needed:

OP-301-1, Section 8.4.12 with steps 8.4.12.1.a and b filled in
APP-001-A4, CCW Surge Tank Hi/Lo Level
APP-036-D8, Process Monitor Hi Rad
AOP-005, Radiation Monitoring System
AOP-014, Component Cooling Water System Malfunction

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant is at 100% power.
2. All plant controls are in auto/normal.
3. You are the Reactor Operator.

INITIATING CUES:

You are to respond to events as they occur.

START TIME: _______

STEP 1:	Acknowledge Radiation Monitor System Recorder and respond to APP-036-D8, PROCESS MONITOR HI RAD annunciator.	
STANDARD:	Operator: • depresses the ACK ALARM button on the Radiation Monitor System Recorder and determines point #19 is alarming. • acknowledges APP-036-D8 and references APP-036-D8	____ SAT ____ UNSAT
COMMENTS:		
STEP 2:	Observe affected radiation monitor for radiation levels AND evidence of short term spiking. (APP-036-D8, Step 1)	
STANDARD:	Operator determines R-17 is elevated and does not exhibit spiking.	____ SAT
COMMENTS:		____ UNSAT
STEP 3:	IF short term spiking is evidenced, THEN allow the indicated level to decrease prior to performing step 3. (APP-036-D8, Step 2)	
STANDARD:	Operator determines no short term spiking.	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Perform the following to determine if the alarm is valid: (APP-036-D8, Step 3.1,2) 1. Momentarily depress the ALARM/RESET pushbutton. 2. IF the alarm returns, THEN refer to AOP-005.	**CRITICAL STEP**
STANDARD:	Operator depresses the R-17 ALARM/RESET pushbutton and determines AOP-005 entry is required due to the alarm returning.	____ SAT
COMMENTS:		____ UNSAT

STEP 5: Use Non-Performed Attachment(s) Listed Below For Radiation Monitor(s) In Alarm: (AOP-005, Step 1) STANDARD: Operator determines Attachment 16 for R-17 is applicable and transitions to Att. 16. COMMENTS:	____ SAT ____ UNSAT
STEP 6: Check CCW Surge Tank level - INCREASING (AOP-005, Att. 16, Step 1) STANDARD: Operator determines CCW Surge Tank level is increasing by observing: • LI-614 on the RTGB • CCW Surge Tank trend on ERFIS COMMENTS:	____ SAT ____ UNSAT
STEP 7: Go TO AOP-014, Component Cooling Water System Malfunction, While Continuing With This Procedure (AOP-005, Att. 16, Step 2) STANDARD: Operator transitions to AOP-014. **EXAMINER'S CUE: Another operator will perform the actions associated with AOP-005.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: Implement the EALs (AOP-014, Step 1) STANDARD: Operator informs the CRSS/SSO to implement the EALs **EXAMINER'S CUE: When informed, acknowledge performing the EALs.** **EXAMINER'S NOTE:** COMMENTS:	____ SAT ____ UNSAT

STEP 9:	Go To Appropriate Section For Indicated Malfunction (AOP-014, Step 2)	____ SAT ____ UNSAT
STANDARD:	Operator transitions to Section B, Increasing CCW Inventory	
COMMENTS:		
STEP 10:	Check FCV-626, THERM BAR FLOW CONT - AUTO CLOSED (AOP-014, Section B, Step 1)	____ SAT ____ UNSAT
STANDARD:	Operator determines FCV-626 is open by observing the red open light illuminated and answers no then goes to the RNO.	
COMMENTS:		
STEP 11:	IF APP-001-C1 is NOT ILLUMINATED, THEN observe the NOTE prior to Step 7 and Go To Step 7. (AOP-014, Section B, Step 1.b RNO)	____ SAT ____ UNSAT
STANDARD:	Operator transitions to Step 7.	
COMMENTS:		

NOTE: Coordination between operator at drain hose and personnel monitoring Surge Tank level will be required when trying to determine if the leak is isolated.

A preconstructed drain hose is available in the EOP tool locker.

STEP 12:	Maintain Surge Tank level as follows: (AOP-014, Section B, Step 7.a.b.c) a. Install a drain hose at the CC HX SHELL DRAIN for either of the CCW Heat Exchangers • CC-877A OR • CC-877B b. Drain CCW Surge Tank, as necessary, to maintain level 47% to 53% c. Notify Chemistry personnel that chromates are being drained to the WHUT	____ SAT ____ UNSAT
STANDARD:	Operator : a. directs the Inside Auxiliary Operator to install the preconstructed drain hose at either CC-877A or 877B. b. maintains Surge Tank level between 47% and 53% c. notifies Chemistry personnel that chromates are being drained to the WHUT	
BOOTH INSTRUCTOR CUE:	**When directed, acknowledge installing the drain hose at either CC-877A or 877B.** **When called, acknowledge as a Chemistry technician that chromates are being drained to the WHUT.**	
COMMENTS:		
STEP 13:	Check R-17, COMPONENT COOLING WATER RADIOACTIVE LIQUID - INCREASING TREND <u>OR</u> ALARM (AOP-014, Section B, Step 8)	____ SAT ____ UNSAT
STANDARD:	Operator determines R-17 is in alarm	
COMMENTS:		

STEP 14: Determine If Leakage Exists In An RCP Thermal Barrier As Follows: (AOP-014, Section B, Step 9.a.b.c.) a. Verify Thermal Barrier ΔP to ALL RCPs - GREATER THAN 5 INCHES b. Close FCV-626, THERM BAR FLOW CONT c. Check CCW Surge Tank level increase - STOPPED **STANDARD:** Operator: a. determines Thermal Barrier ΔPs are greater than 5 inches by observing PI-131A, 128A, & 125A b. positions control switch for FCV-626 to close and observes green shut light illuminated. c. answers no. • Opens FCV-626, THERM BAR FLOW CONT • transitions to Step 10 per Step 9.c RNO. **EXAMINER'S NOTE: APP-001-D1 will alarm due to closing FCV-626.** COMMENTS:	____ SAT ____ UNSAT

NOTE: Any leakage in the Non-regenerative Heat Exchanger, will reverse flow, when letdown is isolated.

Leakage in the Non-regenerative Heat Exchanger can be identified by a reduction in indicated letdown flow.

STEP 15: Determine If Leakage Exists In Non-Regenerative HX As Follows: (AOP-014, Section B, Step 10.a.b.c.d.) a. Check normal OR RHR letdown - IN SERVICE b. Check RCS - VENTED OR HAVE PZR BUBBLE c. Verify LCV-115A, VCT/HLDP TK DIV - IN HLDP TK POSITION d. Place TCV-143, VCT/DEMIN DIV, in the VCT position **STANDARD:** Operator: a. determines normal letdown is in service b. determines PZR bubble exists c. positions the control switch for LCV-115A in the HLDP TK POSITION and observes the white HLDP TK light illuminated d. positions the control switch for TCV-143 in the VCT POSITION and observes the green VCT light illuminated COMMENTS:	____ SAT ____ UNSAT

STEP 16:	Isolate letdown source by performing the following: (AOP-014, Section B, Step 10.e) • Verify CVC-460 A&B, LTDN LINE STOP, - CLOSED OR • Verify HIC-142, PURIFICATION FLOW - SET TO 0%	**CRITICAL STEP**
STANDARD:	Operator positions CVC-460A&B to the closed position and observes the green shut light illuminated.	____ SAT
COMMENTS:		____ UNSAT
STEP 17:	Check CCW Surge Tank level increase - STOPPED (AOP-014, Section B, Step 10.f)	
STANDARD:	Operator determines CCW Surge Tank level is slowly decreasing by observing LI-614 on the RTGB or CCW trend on ERFIS	____ SAT
COMMENTS:		____ UNSAT
STEP 18:	Isolate Non-Regenerative HX as follows: (AOP-014, Section B, Step 10.g) • Verify CVC-204B, LTDN LINE ISL - CLOSED • Direct an operator to perform Attachment 7, Non-regenerative Hx Local Isolation	____ SAT
STANDARD:	Operator • positions control switch for CVC-204B in the closed position and observes the green light illuminated. • directs the IAO to perform Attachment 7, Non-regenerative Hx Local Isolation	____ UNSAT
BOOTH INSTRUCTOR CUE:	**When called, acknowledge as the IAO to perform Attachment 7.**	
COMMENTS:		

STEP 19: Inform Chemistry personnel that chromated water has been diverted to the CVCS HUT (AOP-014, Section B, Step 10.h) STANDARD: Operator calls Chemistry personnel and informs them that chromated water has been diverted to the CVCS HUT. **BOOTH INSTRUCTOR CUE: When called, acknowledge as the Chemistry technician that chromated water has been diverted to the CVCS HUT.** COMMENTS:	____ SAT ____ UNSAT
STEP 20: Place excess letdown in service using OP-301, Chemical and Volume Control System (CVCS) (AOP-014, Section B, Step 10.i) STANDARD: Operator informs the CRSS that excess letdown is required to be placed in service. **EXAMINER CUE: Direct operator to place Excess Letdown in service IAW OP-301** COMMENTS:	____ SAT ____ UNSAT
STEP 21: Operator obtains a copy of OP-301-1, section 8.4.12 STANDARD: Operator obtains a copy of OP-301-1 **EXAMINER CUE: Hand the operator a copy of OP-301-1** **If asked, the initial lineup(s) are complete** COMMENTS:	____ SAT ____ UNSAT

CAUTION: Redundant Charging Header Pressure shall be utilized when available, such as RTGB indication (PI-121), ERFIS (CHP0142A), and local indication. (CR 95-01752)

NOTE: This procedure involves systems and activities with negligible potential to reduce margins of safety OR introduce unwanted transients OR plant trips. This is a Case Three evolution and no additional management involvement is required beyond that routinely provided by first line supervision.

STEP 22: IF available, THEN perform the following: (Step 8.4.12.1.c) 1) Place on ERFIS trend Charging Header Pressure (CHP0142A) and RCS Charging Flow (CHF0128A). (CR 95-01752) 2) Update the ERFIS Calorimetric program to reflect Excess Letdown is in service. STANDARD: 1) ERFIS points CHF0142A and CHF0128A are displayed. 2) ERFIS Calorimetric is updated **EXAMINER'S CUE: The STA will update the ERFIS Calorimetric Program** **EXAMINER'S NOTE: The operator may "call up" points individually or use Group Display CVCS** COMMENTS:	____ SAT ____ UNSAT
STEP 23: Verify open CC-739, CCW FROM EXCESS LTDN HX (Step 8.4.12.1.d) STANDARD: Operator determines CC-739 is open by observing the red open light illuminated COMMENTS:	____ SAT ____ UNSAT
STEP 24: Verify Component Cooling Water flow is greater than or equal to 240 gpm as indicated by FI-624. (Step 8.4.12.1.e) STANDARD: Operator determines CCW flow to the Excess Letdown Heat Exchanger (FI-624) ≥ 240 gpm by local AO observation **BOOTH INSTRUCTOR'S CUE: When called, respond as the Inside Auxiliary Operator and report FI-624 indicates 250 gpm** COMMENTS:	____ SAT ____ UNSAT

NOTE: Additional excess letdown flow may be obtained by placing CVC-389, EXCESS LTDN DIV, to the RCDT position, however considerations should be given to the additional liquid waste generated. (CR 95-01752)

STEP 25: Position CVC-389, EXCESS LTDN DIV, as required by plant conditions (Step 8.4.12.1.f) STANDARD: Operator positions CVC-389 to the VCT as indicated by the white VCT light illuminated COMMENTS:	____ SAT ____ UNSAT
STEP 26: Open CVC-387, EXCESS LTDN STOP. (Step 8.4.12.1.g) STANDARD: Operator opens CVC-387 by placing the control switch to the open position and observing the red open light illuminated. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

CAUTION: Excess Letdown HX outlet temperature shall NOT exceed 195°F.

STEP 27: Using HIC-137 positioner slowly open HCV-137, EXCESS LTDN FLOW, allowing for warmup of the Excess Letdown Heat Exchanger. (Step 8.4.12.1.h) STANDARD: Operator slowly opens HCV-137 by rotating the potentiometer in the clockwise direction while observing/maintaining TI-139 (Excess Letdown HX Outlet Temperature) < 195°F. **EXAMINER'S NOTE: HIC-137 at ~ 80% demand will raise Excess Letdown HX Outlet temperature to ≤195 °F** **EXAMINER CUE: Another operator will complete this section.** COMMENTS: **END OF JPM**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Calculate Quadrant Power Tilt Ratio IAW FMP-007 (015*004*R2*01)

Alternate Path:

N/A

Facility JPM #:

JPM CR-106
RO / SRO

K/A Rating(s):

015 A1.04 (3.5/3.7)

Task Standard:

Perform a manual QPTR calculation IAW FMP-007, Quadrant Power Tilt with an accuracy as stated on attached form.

Preferred Evaluation Location: Simulator __X__ In-Plant ______

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

FMP-007, Quadrant Power Tilt

Validation Time: 15 min. **Time Critical:** No

Candidate: ________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ________________________ ________________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 2
Critical because the operator must accurately read the nuclear instruments

Step 7
Critical because the operator must determine the maximum Upper Normalized Detector Ratio

Step 8
Critical because the operator must determine the maximum Lower Normalized Detector Ratio

Step 9
Critical because the operator must determine the maximum QPTR

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-214, go to RUN and allow conditions to stabilize
2. Place simulator in FREEZE
3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-23 Chemistry Sheet

Tools/Equipment/Procedures Needed:

FMP-007
Calculator

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The unit is at ~51%, 325 MWe

Nuclear Instrument PRNI-41 is inoperable due to a failed high voltage power supply.
All actions for the inoperable PRNI have been taken.

In addition to the alarms caused by the inoperable NI, the following alarm(s) are illuminated:

- APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT

INITIATING CUES:

The CRSS has directed you to determine the Quadrant Power Tilt for the current plant conditions.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of FMP-007, Quadrant Power Tilt. ***Hand the candidate the copy of the procedure after he/she locates it.*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Read the Upper (A) and the Lower (B) Indicated Detector Currents from the Detector Current meters of each operable Power Range channel and record on ATTACHMENT 10.2 (Step 8.2.4.1) STANDARD: Upper and Lower Detector Currents recorded for PRNI-42,43, & 44 **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 3: Record the Upper and Lower Detector Normalizing Detector Currents from the Control Room Status Board for each operable Power Range channel on ATTACHMENT 10.2. (Step 8.2.4.2) STANDARD: Upper and Lower Detector Normalizing Detector Currents recorded from the Control Room Status Board on ATTACHMENT 10.2: **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT

NOTE: Normalized Ratios, Average Ratios and QPTR values should be recorded to at least 3 decimal places.

STEP 4: Divide each Indicated Detector Current by its corresponding Normalizing Detector Current and record the result on ATTACHMENT 10.2. (Step 8.2.4.3) STANDARD: Indicated Detector Currents divided by their corresponding Normalizing Detector Currents and recorded on ATTACHMENT 10.2. **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT
STEP 5: Average the Upper Normalized Detector Ratios and record the result as the Average Normalized Detector Ratio in the Upper column on ATTACHMENT 10.2. (Step 8.2.4.4) STANDARD: Upper Normalized Detector Ratios averaged and recorded on ATTACHMENT 10.2. Average Upper Normalized Detector Ratio: **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT
STEP 6: Average the Lower Normalized Detector Ratios and record the result as the Average Normalized Detector Ratio in the Lower column on ATTACHMENT 10.2 (Step 8.2.4.5) STANDARD: Lower Normalized Detector Ratios averaged and recorded on ATTACHMENT 10.2. Average Lower Normalized Detector Ratio **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT

<u>STEP 7</u>: Determine the maximum Upper Normalized Detector Ratio and divide it by the Average Upper Normalized Detector Ratio and record the resulting Upper QPTR on ATTACHMENT 10.2. (Step 8.2.4.6) <u>STANDARD</u>: PRNI-42 (maximum Upper Normalized Detector Ratio) divided by the Average Upper Normalized Detector Ratio and recorded on ATTACHMENT 10.2. **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 8</u>: Determine the maximum Lower Normalized Detector Ratio and divide it by the Average Lower Normalized Detector Ratio and record the resulting Lower QPTR on ATTACHMENT 10.2 (Step 8.2.4.7) <u>STANDARD</u>: PRNI-44 (maximum Lower Normalized Detector Ratio) divided by the Average Lower Normalized Detector Ratio and recorded on ATTACHMENT 10.2. **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 9</u>: Record the larger of the Upper QPTR or the Lower QPTR as the Maximum QPTR on ATTACHMENT 10.2 along with the reactor power and any comments. (Step 8.2.4.8) <u>STANDARD</u>: QPTR recorded as the maximum QPTR, Power Level recorded as 51%. <u>COMMENTS</u>: **END OF TASK**	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT

TIME STOP: ________

ATTACHMENT 10.2

MANUAL QPTR CALCULATIONS

This revision is the latest revision available and has been verified against NRCS.

______________________ ______ ______________________ ______
Name (Print) Initial Signature Date

Channel	Indicated Detector Currents		Normalizing Detector Currents		Normalized Detector Ratio	
	Upper	Lower	Upper	Lower	Upper	Lower
N41	OOS	OOS	OOS	OOS	OOS	OOS.
N42	75 **78** 80	73 **75** 77	**250.5**	**249**	.2994 **.3114** .3194	.2934 **.3012** .3092
N43	74 **76** 77	72 **73** 75	**250.5**	**249**	.2954 **.3034** .3074	.2892 **.2932** .3012
N44	75 **77** 79	73 **74** 75	**250.5**	**249**	.2994 **.3074** .3154	.2905 **.2972** .3012
Average Normalized Detector Ratio =					.2981 **.3074** .3141	.2910 **.2972** .3039

Upper QPTR = **.3114** .2994 .3194 (Max Normalized Ratio) / **.3074** .2981 .3141 (Avg Normalized Ratio) = **1.013** 1.004 1.017

Lower QPTR = **.3012** .2934 .3092 (Max Normalized Ratio) / **.2972** .2910 .3039 (Avg Normalized Ratio) = **1.013** 1.008 1.017

Maximum QPTR = **1.013** 1.008 1.017 Power Level = **51%**

Performed By: ______________________ Date: __________ Time: __________

Comments: ____

SSO Review: ______________________ Date: __________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Add water to the PRT IAW OP-103	007*002*R1*01
Drain water from the PRT when Pressurizer temperature is greater than 200 °F IAW OP-103	007*004*R1*01
Vent the PRT IAW OP-103	007*006*R1*01

Alternate Path:

N/A

Facility JPM #:

CR-107
RO / SRO

K/A Rating(s):

007 A1.01 (2.9/3.1) 007 A1.02 (2.7/2.9)
007 A1.03 (2.6/2.7) 007 A2.02 (2.6/3.2)

Task Standard:

ESTABLISH NORMAL OPERATING CONDITIONS IN THE PRT IAW OP-103

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ Perform __X__ Simulate ______

References:

OP-103

Validation Time: 15 min. **Time Critical: NO**

Overall Time

Candidate: ____________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ____________________ ____________________/________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because operator action is required to establish the PRT drain path.

Step 6
Critical because operator must recognize PRT temperature is > 120°Fto transition to proper section of the procedure.

Step 8
Critical because a Primary Water Pump must be started to cool the water in the PRT.

Step 9
Critical because RC-519A&B are the Containment Isolation valves which must be open to allow Primary Water into the Containment.

Step 10
Critical because RC-519C must be opened to provide a flowpath for Primary Water to the PRT.

Step 11
Critical because RC-519A&B and C must be closed to isolate Primary Water to the Containment.

Step 15
Critical because RC-549 is required to be opened to vent the PRT to the Vent Header.

Step 17
Critical because RC-549 must be closed to isolate the PRT from the Vent Header.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-212

2. If IC-212 is not functioning, perform the following:
   - Initialize simulator to IC-5 and go to RUN.
   - Fill the PRT with Primary Water to 82%.
   - Insert malfunction **PRS03C** at 10% (PZR PORV PCV-456 failed open)
   - Close PORV Block Valve RC-535 when the following conditions are reached in the PRT
     TI- 471 (PRT temperature) 128°F
   - Allow plant conditions to stabilize

3. Place the simulator in FREEZE.

4. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-103, Pressurizer Relief Tank Control System.

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The unit was at 100% when PZR PORV PCV-456 failed open.

The crew responded IAW the appropriate plant procedures. Plant conditions are now stable.

INITIATING CUES:

The CRSS has directed you to restore PRT parameters to normal operating conditions IAW OP-103.

START TIME: ______

EXAMINER NOTE: The operator will probably address the PRT parameters in the same sequence as the procedure, although successful performance is not sequence dependent.

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-103. **Hand the candidate the copy of the procedure after he/she locates it.** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 2: 1. All prerequisites of Section 3.0 are complete.. (Step 6.1.1.1-3) 2. The Pressurizer temperature is ≥ 200°F AND PRT level is above 70%. 3. Primary water addition to the PRT is NOT in progress. STANDARD: Prerequisites verified complete. PZR verified > 200°F on TI-453/454. PRT level verified > 70% on LI-470. RC-519A&B, PW TO CV ISO and/or RC-519C, PW TO PRT ISO verified closed. **EXAMINER'S CUE: If asked, all systems are aligned for operation.** **Nitrogen — Instrument & Station Air** **Primary Water — Liquid Waste Disposal** **Waste Gas — Gas Analyzer** **BOOTH INSTRUCTOR'S CUE: If asked as the Chemistry Technician, the last sample indicated 0% hydrogen in the PRT.** COMMENTS:	____ SAT ____ UNSAT

NOTE: The following step is a continuous action step and should be performed when conditions are met.

STEP 3: IF the PRT temperature is ≥ 160°F, THEN Go To 6.1.2.5. (Step 6.1.2.1) STANDARD: PRT temperature is checked < 160°F on TI-471. COMMENTS:	____ SAT ____ UNSAT

NOTE: Placing RC-523, PRT DRAIN, control switch in OPEN also opens LCV-1003B, RCDT PUMP "B" SUCTION, and starts REACTOR COOLANT DRAIN TANK PUMP "B" if the control switches are in AUTO.

STEP 4: IF the normal drain path via the RCDT is available, AND a Containment Phase A Isolation signal is not present, THEN perform the following: (Step 6.1.2.2.a & b) a. Open RC-523, PRT DRAIN b. WHEN PRT level returns to between 70% and 74%, THEN close RC-523. STANDARD: RC-523 cycled to obtain PRT level between 70% and 74% indicated on LI-470. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** **"B" RCDT Pump in AUTO** **LCV-1003B, RCDT PUMP "B" SUCTION is in AUTO** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 5: IF the normal drain path via the RCDT is not available, OR a Containment Phase A Isolation signal is present, THEN perform the following: (Step 6.1.2.3.a-d) a. Open WD-1708, RCDT DRAIN TO CV SUMP b. Verify REACTOR COOLANT DRAIN TANK PUMP "B" control switch in STOP. c. Open RC-523, PRT DRAIN. d. WHEN PRT level returns to between 70% and 74%, THEN perform the following: 1) Close RC-523 2) Close WD-1708 3) Place REACTOR COOLANT DRAIN TANK PUMP "B" control switch in the proper position for plant conditions. STANDARD: Normal drain path via RCDT is available, this step N/A. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** COMMENTS:	____ SAT ____ UNSAT

STEP 6:	IF PRT temperature is >120°F, THEN add Primary Water to the PRT IAW Section 6.2. (Step 6.1.4)	**CRITICAL STEP**
STANDARD:	PRT temperature indicates >120°F on TI-471, candidate recognizes need to cool the PRT IAW Section 6.2.	____ SAT
COMMENTS:		____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 7:	1. All the Prerequisites of Section 3 are complete. (Step 6.2.1.1-3) 2. PRT level is < 80%. 3. Draining the PRT is NOT in progress. (SER 93-007)	
STANDARD:	Prerequisites verified complete. PRT verified <80% on LI-470 RC-523 verified closed using green light above RTGB control switch.	____ SAT
COMMENTS:		____ UNSAT

CAUTION: Operating 2 Primary Water Pumps has the capacity to fill the PRT faster than it can vent. If the RCS is depressurized and vented through a PORV when 2 Primary Water Pumps are operating, it is possible to inadvertently makeup to the RCS via the PRT spargers. If the expected PRT level increase does not occur, filling the PRT should be stopped and the problem investigated.

STEP 8:	Verify a Primary Water Pump is OPERATING. (Step 6.2.2.1)	**CRITICAL STEP**
STANDARD:	"A" or "B" Primary Water Pump operating as indicated by the red light above the RTGB control switch.	____ SAT
COMMENTS:		____ UNSAT

STEP 9: Open RC-519A&B, PW TO CV ISO. (Step 6.2.2.2) STANDARD: RC-519A&B open indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 10: Open RC-519C, PW TO PRT ISO. (Step 6.2.2.3) STANDARD: RC-519C open indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Increasing PRT level will cause PRT pressure to increase, possibly to the high pressure alarm setpoint of 5 psig.

STEP 11: WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 6.2.2.4.a.,b) a. Close RC-519A&B. b. Close RC-519C. STANDARD: RC-519A&B closed indicated by the green light above the RTGB control switch. RC-519C closed indicated by the green light above the RTGB control switch. **EXAMINER NOTE: Candidate may vent the PRT during the 10 minute wait period.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 12: IF no longer required to support plant conditions, THEN stop the Primary Water Pump. (Step 6.2.2.5) STANDARD: Candidate observes PRT temperature <120°F on TI-471 and determines the Primary Water Pump is no longer required. Primary Water Pump indicates stopped by the green light above the RTGB control switch. COMMENTS:	____ SAT ____ UNSAT
STEP 13: IF PRT level is ≥ 83% OR PRT temperature is > 120°F, THEN lower PRT level IAW Section 6.1. (Step 6.2.2.6) STANDARD: PRT level < 83% PRT temperature < 120°F. **EXAMINER NOTE: If the PRT was overfilled in previous step, re-perform JPM steps 2 thru 6, otherwise operator should perform section 6.3 to vent the PRT** COMMENTS:	____ SAT ____ UNSAT
STEP 14: 1. All the Prerequisites of Section 3.0 are complete. (Step 6.3.1.1,2) 2. PRT Pressure is above 3 psig. STANDARD: Prerequisites previously verified complete. PRT pressure indicates > 3 psig on PI-472. COMMENTS:	____ SAT ____ UNSAT

NOTE: High Pressure alarm actuates at 5 psig and the rupture disc ruptures at 100 psig.

STEP 15: Open RC-549, PRT VENT. (Step 6.3.2.1) STANDARD: RC-549 open indicated open by the red light above the RTGB control switch. **EXMAINER NOTE: JPM steps 15, 16 and 17 may be performed IAW the annunciator response procedure APP-003-C3. The actions in OP-103 and APP-003-C3 are identical.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 16: IF required to maintain proper Vent Header pressure, THEN verify a Waste Gas Compressor starts. (Step 6.3.2.2) STANDARD: Operator may direct the Inside Auxiliary Operator to verify a Waste Gas Compressor starts. **BOOTH INSTRUCTOR'S CUE: If asked, report "A" Waste Gas Compressor is running.** COMMENTS:	____ SAT ____ UNSAT
STEP 17: WHEN PRT pressure is < 3 psig, THEN close RC-549. (Step 6.3.2.3) STANDARD: RC-549 closed indicated by green light above the RTGB control switch. COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Add water to the PRT IAW OP-103	007*002*R1*01
Drain water from the PRT when Pressurizer temperature is greater than 200 °F IAW OP-103	007*004*R1*01
Vent the PRT IAW OP-103	007*006*R1*01

Alternate Path:

RC-519B hydraulically locked after opening requiring entry into section 8.1

Facility JPM #:

JPM CR-108
RO / SRO

K/A Rating(s):

007 A1.01 (2.9/3.1) 007 A1.02 (2.7/2.9)
007 A1.03 (2.6/2.7) 007 A2.02 (2.6/3.2)

Task Standard:

ESTABLISH NORMAL OPERATING CONDITIONS IN THE PRT IAW OP-103

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OP-103

Validation Time: 26 min. **Time Critical:** NO

Candidate: ______________________
NAME

Overall Time
Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______

Performance Time: ________

Examiner: ______________________ ______________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 3
Critical because operator must recognize PRT temperature is > 160°F to make proper procedural transition.

Step 4
Critical because operator must align a flowpath from the PRT to the CV Sump to drain the PRT.

Step 5
Critical because operator must align a flowpath from the PRT to the CV Sump to drain the PRT.

Step 6
Critical because operator must align a flowpath from the PRT to the CV Sump to drain the PRT.

Step 7
Critical because operator must open drain to lower PRT level.

Step 8
Critical because PRT drain valve must be closed to maintain adequate PRT level

Step 9
Critical to restore RCDT Pumps to normal configuration.

Step 13
Critical because a Primary Water Pump must be started to cool the water in the PRT

Step 14
Critical because RC-519A & B are the Containment Isolation valves which must be open to allow Primary Water into Containment

Step 15
Critical because RC-519C must be open to provide a flowpath for Primary Water to the PRT

Step 16
Critical because RC-519A,B, & C must be closed to isolate Primary Water to the Containment

Step 20
Critical because RC-519C must be cycled to "unlock" RC-519B

Step 29
Critical because RC-549 is required to be opened to vent the PRT to the Vent Header

Step 31
Critical because RC-549 must be closed to isolate the PRT from the Vent Header

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-213 and activate CAEP 88_JPM_CR_108_R0

2. If IC-213 and/or CAEP is not functioning, perform the following:
   - Initialize simulator to IC-5 and go to RUN.
   - Fill the PRT with Primary Water to 82%.
   - Insert malfunction **PRS03C** at 10% (PZR PORV PCV-456 failed open)
   - Close PORV Block Valve RC-535 when the following conditions are reached in the PRT
     TI- 471 (PRT temperature) 164°F
   - Allow plant conditions to stabilize

3. Place the simulator in FREEZE

4. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

The CAEP has the following triggers included:

- E9 (88_JPM_CR_108): When RC-523 control switch is placed in the open position,
  PRT level (LT-470) will decrease to a minimum of 68% over a 4 minute ramp
  PRT temperature (TT-471) will decrease to 125°F over a 5 minute ramp

- E10 (88_JPM_CR_108_1): When RC-519C control switch is placed in the open position,
  PRT temperature (TT-471) will decrease to 118°F over a 3 minute ramp
  PRT level (LT-470) will increase to a maximum of 82% over a 4 minute ramp

- E5 (88_JPM_CR_108_2): After RC-523 control switch has been opened then closed,
  PRT temperature and level (TT-471 and LT-470) are overridden as is

- E6 (88_JPM_CR_108_3): After RC-519C has been opened then closed,
  PRT temperature (TT-471) is overridden to 118°F
  PRT level (LT-470) is overridden as is

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-103, Pressurizer Relief Tank Control System
Caution Tag Index & Caution Tag Sheet

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The unit was at 100% when PZR PORV PCV-456 failed open approximately 30 minutes ago.

The crew responded IAW the appropriate plant procedures. Plant conditions are now stable.

INITIATING CUES:

The CRSS has directed you to restore PRT parameters to normal operating conditions IAW OP-103

EXAMINER CUE:

For the purposes of this JPM, PRT parameters will respond quicker than normal[1].

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[1] NUREG 1021 (Final Rev. 8) Appendix E, Part E, Simulator Test Guidelines No. 9

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-103. ***Hand the operator the copy of the procedure after he/she locates it.*** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 2: 1. All prerequisites of Section 3.0 are complete. (Step 6.1.1.1-3) 2. The Pressurizer temperature is ≥ 200°F AND PRT level is above 70%. 3. Primary water addition to the PRT is NOT in progress. STANDARD: Prerequisites verified complete. PZR verified > 200°F on TI-453/454. PRT level verified > 70% on LI-470. RC-519A&B, PW TO CV ISO and/or RC-519C, PW TO PRT ISO verified closed. **EXAMINER'S CUE: If asked, all systems are aligned for operation.** **Nitrogen — Instrument & Station Air** **Primary Water — Liquid Waste Disposal** **Waste Gas — Gas Analyzer** **BOOTH INSTRUCTOR'S CUE: If asked as the Chemistry Technician, the last sample indicated 0% hydrogen in the PRT.** COMMENTS:	____ SAT ____ UNSAT

NOTE: The following step is a continuous action step and should be performed when conditions are met.

STEP 3:	IF the PRT temperature is ≥ 160°F, THEN Go To 6.1.2.5. (Step 6.1.2.1)	**CRITICAL STEP**
STANDARD:	Operator determines PRT temperature >160°F by observing TI-471 and proceeds to step 6.1.2.5	____ SAT
COMMENTS:		____ UNSAT

CAUTION: If the PRT temperature exceeds 160°F its content should be drained to the sump. Water from the sump shall not be pumped through Containment Isolation valves until the integrity of the PRT Liner and/or the acceptable leakage rates of the valves has been verified. (ESR 96-00608)

STEP 4:	Verify CV Sump equipment aligned as follows: (Step 6.1.2.5.a) 1. CV Sump Pump breakers OPEN • CV SUMP PUMP "A" on MCC 2 in CMPT 3M • CV SUMP PUMP "B" on MCC 1 in CMPT 5H 2. CV Sump Pump Discharge valves CLOSED • WD-1728, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION • WD-1723, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Operator directs the Inside Auxiliary Operator to verify: • CV SUMP PUMP "A" on MCC 2 in CMPT 3M breaker is open • CV SUMP PUMP "B" on MCC 1 in CMPT 5H breaker is open • WD-1728, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION is closed • WD-1723, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION is closed	
BOOTH INSTRUCTOR'S CUE:	**When directed, open breakers MCC-2 / 3M (OAO) and MCC-1 / 5H (IAO) and close valves WD-1728 and 1723 and report to the Control Room** **RFP EPS 354 RACKOUT** **RFP EPS 355 RACKOUT** **RFI WDS 002 CLOSE** **RFI WDS 003 CLOSE**	
COMMENTS:		

STEP 5: Open WD-1708, RCDT DRAIN TO CV SUMP (Step 6.1.2.5.b) STANDARD: Inside Auxiliary Operator directed to open WD-1708. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator by opening WD-1708 and report its position** **RFP MSC 029 max** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 6: Place REACTOR COOLANT DRAIN TANK PUMPS "A" & "B" control switches in STOP. (Step 6.1.2.5.c) STANDARD: Inside Auxiliary Operator directed to place the Reactor Coolant Drain Tank Pumps "A" & "B" control switches in STOP. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator by placing the control switches for the Reactor Coolant Drain Pumps "A" & "B" in the Stop position and reporting their position** **RFP MSC 007** **RFP MSC 008** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: Open RC-523, PRT DRAIN. (Step 6.1.2.5.d) STANDARD: RC-523 indicated open by the red light above RTGB control switch. **BOOTH INSTRUCTOR'S NOTE: Trigger E9 initiated when RC-523 is placed in the open position** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 8: WHEN PRT level returns to between 70% and 74%, THEN perform the following: (Step 6.1.2.5.e) 1. Close RC-523. 2. Close WD-1708 STANDARD: When PRT level indicates between 70% and 74% on LI-470: 1. RC-523 is closed as indicated by the green light above the RTGB control switch. 2. Inside Auxiliary Operator is directed to close WD-1708. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator by closing WD-1708 and reporting its position** **RFP MSC 029 min** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 9: Place REACTOR COOLANT DRAIN TANK PUMPS "A" & "B" control switches in AUTO. (Step 6.1.2.5.f) STANDARD: Inside Auxiliary Operator directed to place the Reactor Coolant Drain Tank Pumps "A" & "B" control switches in AUTO. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator that the Reactor Coolant Drain Tank Pumps "A" & "B" control switches have been returned to AUTO** **RFP MSC 007** **RFP MSC 008** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 10: Place caution tag on RC-523 switch that reads "If the PRT requires draining it shall be aligned to the CV sump only", This caution to remain in effect until the PRT internal coating evaluation is complete. (Step 6.1.2.5.g) STANDARD: Caution tag (yellow cap) placed on RC-523 control switch. **BOOTH INSTRUCTOR'S CUE: If requested/directed as the Work Control Center SRO, respond that a caution tag clearance has been initiated.** **EXAMINER'S CUE: Once the operator determines a caution tag is required, hand the operator the Caution Tag Sheet and Yellow Cap** COMMENTS:	____ SAT ____ UNSAT

STEP 11: Consult RESS for PRT internal coating evaluation. (Step 6.1.2.5.h) STANDARD: RESS consulted to perform an internal coating evaluation for the PRT. **BOOTH INSTRUCTOR'S CUE: If consulted, respond as a RESS system engineer that an internal coating evaluation for the PRT has been performed. PRT Liner integrity determined to be acceptable as long as PRT internal temperature has not exceeded 160°F for more than 3 hours.** **EXAMINER'S CUE: If requested, respond as the CRSS / STA / SSO that RESS will be contacted to perform an internal coating evaluation of the PRT. Then, respond as a RESS system engineer that an internal coating evaluation for the PRT has been performed. PRT Liner integrity determined to be acceptable as long as PRT internal temperature has not exceeded 160°F for more than 3 hours.** **EXAMINER'S NOTE: The Caution Tag can be removed due to the evaluation being complete** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 12: 1. All the Prerequisites of Section 3 are complete. (Step 6.2.1.1-3) 2. PRT level is < 80%. 3. Draining the PRT is NOT in progress. (SER 93-007) STANDARD: Prerequisites verified complete. PRT verified <80% on LI-470 RC-523 verified closed using green light above RTGB control switch. COMMENTS:	____ SAT ____ UNSAT

CAUTION: Operating 2 Primary Water Pumps has the capacity to fill the PRT faster than it can vent. If the RCS is depressurized and vented through a PORV when 2 Primary Water Pumps are operating, it is possible to inadvertently makeup to the RCS via the PRT spargers. If the expected PRT level increase does not occur, filling the PRT should be stopped and the problem investigated.

STEP 13: Verify a Primary Water Pump is OPERATING. (Step 6.2.2.1) STANDARD: "A" or "B" Primary Water Pump operating as indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 14: Open RC-519A & B, PW TO CV ISO. (Step 6.2.2.2) STANDARD: RC-519A&B open indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 15: Open RC-519C, PW TO PRT ISO. (Step 6.2.2.3) STANDARD: RC-519C open indicated by the red light above the RTGB control switch. **BOOTH INSTRUCTOR'S NOTE: Trigger E10 initiated when RC-519C is placed in the open position** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Increasing PRT level will cause PRT pressure to increase, possibly to the high pressure alarm setpoint of 5 psig.

EXAMINER'S CUE: If operator announces PRT High Pressure out loud, acknowledge as the CRSS

STEP 16: WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 6.2.2.4.a.,b) a. Close RC-519A&B. b. Close RC-519C. STANDARD: Operator positions the control switches for RC-519A & B and RC-519C to close and observes: • RC-519A closed indicated by the green light above the RTGB control switch. • RC-519B intermediate indicated by the green and red lights illuminated above the RTGB control switch. • RC-519C closed indicated by the green light above the RTGB control switch. **EXAMINER'S NOTE: Operator should inform the CRSS that RC-519B failed to fully close and performance of section 8.1, RELIEVING OF HYDRAULIC LOCK ON RC-519A AND RC-519B is required.** **EXAMINER CUE: Direct operator to perform section 8.1, Relieving of Hydraulic Lock on RC-519A and RC-519B.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 17: RC-519A & B, PW TO CV ISO, control switch is in the CLOSE position and one or both valves indicate in mid position. (Step 8.1.1.1) STANDARD: Operator determines RC-519A & B control switch is in close and RC-519B indicates mid position. COMMENTS:	____ SAT ____ UNSAT
STEP 18: The Post Accident Sampling System is not in operation.. (Step 8.1.1.2) STANDARD: Operator determines PASS is not in service. **BOOTH INSTRUCTOR: Respond as Chemistry Technician and report PASS is not in service.** COMMENTS:	____ SAT ____ UNSAT

STEP 19:	IF RC-519A is indicating in mid position, THEN perform the following. (Step 8.1.2.1)	
STANDARD:	Operator determines RC-519A is not indicating mid position and goes to step 8.1.2.2	____ SAT
COMMENTS:		____ UNSAT
STEP 20:	IF RC-519B is indicating in mid position, THEN cycle RC-519C, PW TO PRT ISO. (Step 8.1.2.2)	**CRITICAL STEP**
STANDARD:	Operator cycles RC-519C by positioning its control switch to open (red light illuminated green light off), then closed (green light illuminated, red light off) and then observes RC-519B closed (green light only illuminated).	____ SAT
COMMENTS:		____ UNSAT
STEP 21:	IF RC-519A OR RC-519B is still indicating mid position, THEN declare the valve out of service and refer to ITS LCO 3.6.3. (Step 8.1.2.3)	
STANDARD:	Operator determines this step is N/A and goes back to section 6, step 6.2.2.5.	____ SAT
COMMENTS:		____ UNSAT
STEP 22:	IF no longer required to support plant conditions, THEN stop the Primary Water Pump. (Step 6.2.2.5)	
STANDARD:	Operator observes PRT temperature <120°F on TI-471 and determines the Primary Water Pump is no longer required. Primary Water Pump is stopped by placing the control switch to the stop position and observing the green light.	____ SAT
COMMENTS:		____ UNSAT

STEP 23: IF PRT level is ≥ 83% OR PRT temperature is > 120°F, THEN lower PRT level IAW Section 6.1 (Step 6.2.2.6) STANDARD: PRT level < 83% on LI-470. PRT temperature < 120°F on TI-471. Operator determines PRT level and temperature are acceptable **EXAMINER'S NOTE: If the PRT was overfilled in previous step, perform JPM steps 19 - 23. Otherwise, go to step 29 to vent the PRT.** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 24: 1. All prerequisites of Section 3.0 are complete.. (Step 6.1.1.1-3) 2. The Pressurizer temperature is ≥ 200°F AND PRT level is above 70%. 3. Primary water addition to the PRT is NOT in progress. STANDARD: Prerequisites verified complete. PZR verified > 200°F on TI-453/454. PRT level verified > 70% on LI-470. RC-519A&B, PW TO CV ISO and/or RC-519C, PW TO PRT ISO verified closed. **EXAMINER'S CUE: If asked, all systems are aligned for operation.** **Nitrogen — Instrument & Station Air** **Primary Water — Liquid Waste Disposal** **Waste Gas — Gas Analyzer** **BOOTH INSTRUCTOR'S CUE: If asked as the Chemistry Technician, the last sample indicated 0% hydrogen in the PRT.** COMMENTS:	____ SAT ____ UNSAT

NOTE: The following step is a continuous action step and should be performed when conditions are met.

STEP 25: IF the PRT temperature is ≥ 160°F, THEN Go To 6.1.2.5. (Step 6.1.2.1) STANDARD: PRT temperature is checked < 160°F on TI-471. COMMENTS:	____ SAT ____ UNSAT

NOTE: Placing RC-523, PRT DRAIN, control switch in OPEN also opens LCV-1003B, RCDT PUMP "B" SUCTION, and starts REACTOR COOLANT DRAIN TANK PUMP "B" if the control switches are in AUTO.

STEP 26: IF the normal drain path via the RCDT is available, AND a Containment Phase A Isolation signal is not present, THEN perform the following: (Step 6.1.2.2.a & b) a. Open RC-523, PRT DRAIN b. WHEN PRT level returns to between 70% and 74%, THEN close RC-523. STANDARD: RC-523 cycled to obtain PRT level between 70% and 74% indicated on LI-470. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** **"B" RCDT Pump in AUTO** **LCV-1003B, RCDT PUMP "B" SUCTION is in AUTO** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 27: IF the normal drain path via the RCDT is not available, OR a Containment Phase A Isolation signal is present, THEN perform the following: (Step 6.1.2.3.a-d) a. Open WD-1708, RCDT DRAIN TO CV SUMP b. Verify REACTOR COOLANT DRAIN TANK PUMP "B" control switch in STOP. c. Open RC-523, PRT DRAIN. d. WHEN PRT level returns to between 70% and 74%, THEN perform the following: 1) Close RC-523 2) Close WD-1708 3) Place REACTOR COOLANT DRAIN TANK PUMP "B" control switch in the proper position for plant conditions. STANDARD: Normal drain path via RCDT is available, this step N/A. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** COMMENTS:	____ SAT ____ UNSAT
STEP 28: IF PRT temperature is >120°F, THEN add Primary Water to the PRT IAW Section 6.2. (Step 6.1.4) STANDARD: PRT temperature indicates <120°F on TI-471, operator determines PRT does not require any further cooling.. COMMENTS:	____ SAT ____ UNSAT

NOTE: High Pressure alarm actuates at 5 psig and the rupture disc ruptures at 100 psig.

STEP 29: Open RC-549, PRT VENT. (Step 6.3.2.1) STANDARD: RC-549 open indicated open by the red light above the RTGB control switch. **EXMAINER NOTE: JPM steps 24, 25 and 26 may be performed IAW the annunciator response procedure APP-003-C3. The actions in OP-103 and APP-003-C3 are identical** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 30: IF required to maintain proper Vent Header pressure, THEN verify a Waste Gas Compressor starts. (Step 6.3.2.2) STANDARD: Operator may direct the Inside Auxiliary Operator to verify a Waste Gas Compressor starts. **BOOTH INSTRUCTOR'S CUE: If asked, report "A" Waste Gas Compressor is running.** COMMENTS:	____ SAT ____ UNSAT
STEP 31: WHEN PRT pressure is < 3 psig, THEN close RC-549. (Step 6.3.2.3) STANDARD: RC-549 closed indicated by green light above the RTGB control switch. COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

EXAMINER NOTE: Debrief the operator regarding use of time compression when draining / cooling the PRT

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the Control Operator's Control Room response to a plant fire on site IAW FP-001
000*067*R5*01
Operate the Fire Detection / Alarm equipment IAW APP-044
086*007*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-109
RO / SRO

K/A Rating(s):

APE 067 - AK3.02 .2.5/3.3   067 - AA1.05 3.0/3.1
067 - AA1.06 3.5/3.7

Task Standard:

Actions taken to mitigate a plant fire on-site IAW plant procedures

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant _____   Perform __X__ Simulate _____

References:

APP-044-B26, ZN-17 Fire Alarm TRN-A HVAC Equipment Room For Cont. Room
APP-044-B89, ZN-17 Fire Alarm TRN-B HVAC Equipment Room For Cont. Room
FP-001, Fire Emergency

Validation Time: 15 min.   **Time Critical: No**

Candidate: ______________________________   Time Start: ________
NAME   Time Finish: ________

Performance Rating: SAT _____ UNSAT _____   Performance Time: ________

Examiner: ________________________   ____________________________/________
NAME   SIGNATURE   DATE

COMMENTS

Step 6
Critical because Control Room ventilation isolation is required to ensure habitability

Step 7 / 19*
Critical because Fire Brigade activation is required for both fire detection trains in the alarm condition

Step 8, 20*
Critical because Control Room operator action required to ensure PA system is placed in Emergency Mode

Step 9, 10, 20*
Critical because Control Room operator must alert the Fire Brigade and station of the fire

Step 11 / 21*
Critical because Electric Motor Driven Fire Pump is manually started from the Control Room

If action is taken per Attachment 7.3, the following steps are not critical:

19
20
21

If action is taken per Section 6.3, the following steps are not critical:

7
8
9
10
11

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC - 5, activate CAEP 88_JPM_CR_109_R0, go to RUN
2. Freeze simulator.
3. Place simulator in run when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

The CAEP has the following triggers included:

- E1 (88_JPM_CR_109): When HVE-16 control switch is placed in STOP, APP-044-B89 (Zone 17 Train B) will alarm.

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

APP-044-B26, ZN-17 Fire Alarm TRN-A HVAC Equipment Room For Cont. Room
APP-044-B89, ZN-17 Fire Alarm TRN-B HVAC Equipment Room For Cont. Room
FP-001, Fire Emergency

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The plant is at 100% power, all systems aligned for normal operation

INITIATING CUES:

You are to respond to events as they occur.

START TIME: _______

STEP 1: Silence Fire Alarm Console alarm. STANDARD: Fire Alarm Computer silenced by depressing F2 **EXAMINER'S NOTE: The Fire alarm will occur ~25 seconds after the simulator is placed in RUN.** COMMENTS:	_____ SAT _____ UNSAT
STEP 2: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of APP-044-B26. **Hand the operator a copy of the procedure after he/she locates it.** **EXAMINER'S NOTE: Operator may reference FP-001 Attachment 7.3.** COMMENTS:	_____ SAT _____ UNSAT
STEP 3: Immediately dispatch FP Tech. Aide or closest Fire Brigade Member to investigate cause of alarm. Reference FP-001. (APP-044-B26, Step 1) STANDARD: Operator dispatches the FP Tech. Aide / Fire Brigade Member to the Control Room HVAC Equipment Room to investigate. **BOOTH INSTRUCTOR'S CUE: Respond as the individual dispatched that you are en-route to the Control Room HVAC Equipment Room.** **If called, respond as Security that you are en-route to the Control Room HVAC Equipment Room to unlock the Security Door.** **EXAMINER NOTE: The door into the Control Room HVAC Equipment Room does not have a key-card entry. The Auxiliary Operators carry a plastisol-covered security key for emergency use.** COMMENTS:	_____ SAT _____ UNSAT

<u>STEP 4</u>: <u>IF</u> an additional alarm on opposite train is received, <u>THEN</u> activate the Fire Brigade per FP-001. (Step 2)

<u>STANDARD</u>: Fire Brigade not activated, no other alarms indicated on Fire Alarm Computer at the present time.

<u>COMMENTS</u>:

____ SAT

____ UNSAT

<u>STEP 5</u>: <u>IF</u> smoke renders the Control Room inaccessible, <u>THEN</u> Go To AOP-004, CONTROL ROOM INACCESSIBILITY. (Step 3)

<u>STANDARD</u>: Control Room Evacuation not required.

EXAMINER'S CUE: The faint odor of smoke is present in the Control Room.

EXAMINER'S NOTE: The operator may dispatch Fire Brigade (sound the Fire Alarm) based on smoke in the Control Room

<u>COMMENTS</u>:

____ SAT

____ UNSAT

<u>STEP 6</u>: <u>IF</u> small amounts of smoke enter the Control Room, <u>THEN</u> isolate the Control Room from the HVAC Equipment Room as follows: (Step 4.1 thru 4.5)

1. Stop HVA-1A, CONT RM AIR HANDLING unit
2. Stop HVA-1B, CONT RM AIR HANDLING unit
3. Close OUTSIDE AIR DAMPER "A"
4. Close OUTSIDE AIR DAMPER "B"
5. Stop HVE-16, CONT RM AIR EXHAUST

<u>STANDARD</u>:

1. HVA-1A control switch placed in STOP, green light illuminated
2. HVA-1B control switch placed in STOP, green light illuminated
3. OUTSIDE AIR DAMPER "A" control switch placed in CLOSE, green light illuminated
4. OUTSIDE AIR DAMPER "B" control switch placed in CLOSE, green light illuminated
5. HVE-16 control switch placed in STOP, green light illuminated

BOOTH INSTRUCTOR'S CUE: The 2nd train Fire Alarm (APP-044-B89) is triggered to actuate when the HVE-16 control switch is placed in STOP.

<u>COMMENTS</u>:

<u>CRITICAL STEP</u>

____ SAT

____ UNSAT

STEP 7: Silence Fire Alarm Console alarm. Activate the Fire Brigade per FP-001. (Step 2) STANDARD: Fire Alarm Console silenced by depressing F2. Operator determines 2nd alarm on Control Room HVAC Equipment Room and obtains FP-001, Attachment 7.3, Control Room Fire Emergency Guide and Emergency Phone Numbers. Operator may refer to APP-044-B89 or go to directly to FP-001. **EXAMINER'S CUE: Hand the operator a copy of FP-001, after he/she locates it.** **EXAMINER'S NOTE: The operator may perform the actions listed on Attachment 7.3, Control Room Fire Emergency Guide and Emergency Phone Numbers, or go directly to Section 6.3. (Turn to JPM Step 16 for direct entry in Section 6.3)** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

NOTE: Portable radios, cell phones, and beepers are available for Fire Brigade notification if the PA system or plant alarms are malfunctioning.

STEP 8: Place the VLC Switch in the "EMERGENCY" position (FP-001, ATT. 7.3, Step C, 1st dash) STANDARD: VLC Switch placed in EMERGENCY. COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

STEP 9: Sound the FIRE ALARM and perform a site wide announcement over the Plant PA (ATT.7.3, Step C, 2nd & 3rd dash) ATTENTION FIRE BRIGADE PERSONNEL. ATTENTION FIRE BRIGADE PERSONNEL. A FIRE HAS BEEN REPORTED AT THE CONTROL ROOM HVAC EQUIPMENT ROOM. STANDARD: Fire Alarm control switch placed in ALARM for 15 seconds and then returned to the MID position. Operator then makes a plant announcement using the PA system. **EXAMINER' NOTE: 15 seconds not included as critical task** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT
STEP 10: Sound the FIRE ALARM a second time and repeat the above message. (ATT. 7.3, Step C, 4th dash) STANDARD: Fire Alarm control switch placed in ALARM for 15 seconds and then returned to the MID position. Operator then makes a plant announcement using the PA system. **BOOTH INSTRUCTOR'S CUE: After the 2nd Fire alarm and PA announcement, call the Control Room as the dispatched individual (from Step 3 above) and report heavy smoke in the Control Room HVAC Equipment Room** **EXAMINER' NOTE: 15 seconds not included as critical task** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

NOTE: The Engine Driven Fire Pump will automatically start if the Motor Fire Pump cannot maintain system pressure.

STEP 11: Start Electric Motor Driven Fire Pump. (ATT. 7.3, Step F) STANDARD: Electric Motor Driven Fire Pump started by placing the control switch on Containment FP System Panel to the right position observing the red light illuminated. COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

STEP 12: Evaluate the need to evacuate plant personnel. Use Local or Site evacuation as needed. (ATT. 7.3, Step G) STANDARD: Based on conservative decision making, the operator may sound the Local evacuation alarm and announce the evacuation of the Control Room HVAC Equipment Room COMMENTS:	____ SAT ____ UNSAT
STEP 13: Notify the RESS Duty Manager, who will notify the RESS Fire Protection Staff and other RESS personnel as necessary (CR 96-01227). (ATT. 7.3, Step H) STANDARD: Operator informs the Control Room supervision to notify the RESS Duty Manager. **EXAMINER'S CUE: If requested, acknowledge notify the RESS Duty Manager** COMMENTS:	____ SAT ____ UNSAT
STEP 14: IF Team Leader requests additional fire fighting assistance THEN call back at least four (4) off shift Fire Brigade personnel. A Team Leader should be called back for each four (4) Fire Brigade Members recalled and/or call the Hartsville Fire Department if needed (see Attachment 7.2). (ATT. 7.3, Step I) **BOOTH INSTRUCTOR'S CUE: As the Fire Brigade Leader, call the Control Room and report:** • **Additional fire fighting assistance will not be required** • **There was no fire, heavy smoke only. Re-flash watch is stationed** • **Apparent cause is the belt on HVA-1A** • **The room has been ventilated** STANDARD: Operator determines no additional assistance is required. COMMENTS:	____ SAT ____ UNSAT

STEP 15: Also see Section 6.3 for additional information. (Step J) STANDARD: Operator refers to Section 6.3. **EXAMINER'S NOTE: If the operator used Attachment 7.3 to perform the initial actions, he/she will refer to Section 6.3 now. Some of the actions in this section will have already been performed by the Annunciator Panel Procedures (APPs) and Attachment 7.3.** COMMENTS:	____ SAT ____ UNSAT
STEP 16: IF indications suggest a fire in the Containment Building, THEN perform the following: (Step 6.3.1) STANDARD: Operator determines there is no indication of fire in the Containment Building. COMMENTS:	____ SAT ____ UNSAT
STEP17 : IF a single Train "A" OR Train "B" alarm on the Fire Alarm Console is received, THEN dispatch the Fire Protection Auxiliary Operator (FPAO) OR a Fire Brigade member to investigate AN report conditions to the Control Room. (Step 6.3.2) STANDARD: Operator dispatches the FP Tech. Aide / Fire Brigade Member to the Control Room HVAC Equipment Room to investigate. **EXAMINER'S NOTE: Could have been performed per ATT. 7.3** COMMENTS:	____ SAT ____ UNSAT

NOTE: Based on information available, the Superintendent Shift Operations can direct other people or groups as needed to deal with situations outside the Fire Brigade response area.

STEP 18:	IF a fire is reported outside of the Fire Brigade Response Area, (see Attachment 7.5) THEN perform the following: (Step 6.3.3)	
STANDARD:	Operator determines the fire is inside the Fire Brigade Response Area.	____ SAT
COMMENTS:		____ UNSAT
STEP 19:	IF any of the following are met, THEN immediately dispatch the Fire Brigade IAW Step 6.3.5 (RAIL 94R0638): (Step 6.3.4) • a verbal report is received in the Control Room of an existing fire in the plant • a second train alarm is received • a system actuation (CO_2, Halon, deluge, pre-action sprinkler system) is received.	**CRITICAL STEP *** ____ SAT
STANDARD:	Operator determines 2nd train alarm on Control Room HVAC Equipment Room and dispatches the Fire Brigade per Step 6.3.5.	____ UNSAT
EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step is NOT critical		
COMMENTS:		

NOTE: Portable radios, cell phones, and beepers are available for Fire Brigade notification if the PA system or plant alarms are malfunctioning.

STEP 20: IF the Control Room determines a Fire Brigade response is required, THEN perform the following: (Step 6.3.5) • Place the VLC Switch in the "EMERGENCY" position and sound the fire alarm for 15 seconds • Announce the location and nature of the fire over the plant P.A. system. • Sound the fire alarm again for 15 seconds and repeat the message. • Notify the Superintendent Shift Operations. STANDARD: VLC Switch placed in EMERGENCY. Fire Alarm control switch placed in ALARM for 15 seconds and then returned to the MID position. Plant announcement using the PA system made. Fire alarm and announcement repeated a second time Superintendent Shift Operations notified **EXAMINER'S CUE: Acknowledge notification (as Superintendent Shift Operations) of the dual train fire alarm in the Control Room HVAC Equipment Room** **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step is NOT critical** **EXAMINER' NOTE: 15 seconds not included as critical task** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

NOTE: The Engine Driven Fire Pump will automatically start if the Motor Fire Pump cannot maintain system pressure.

STEP 21: Verify the Motor Driven Fire Pump is started. (Step 6.3.6) STANDARD: Electric Motor Driven Fire Pump started by turning the control switch on the Containment FP System Panel to the right position and observing the red light illuminated. **BOOTH INSTRUCTOR'S CUE: As the Fire Brigade Leader, call the Control Room and report:** • **Additional fire fighting assistance will not be required** • **There was no fire, heavy smoke only. Re-flash watch is stationed** • **Apparent cause is the belt on HVA-1A** • **The room has been ventilated** **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step is NOT critical** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

STEP 22: IF the fire emergency is of an extended duration AND the Engine Driven Fire Pump is operating, THEN perform the following: (Step 6.3.7) • Dispatch an operator to the intake as available • Contact an off-shift Fire Brigade member to man the fire pumps STANDARD: Operator determines the fire is not of an extended duration. COMMENTS:	____ SAT ____ UNSAT
STEP 23: Review the applicable Fire Protection Preplans to determine potential hazards and consequences within the reported area. (Step 6.3.8) STANDARD: Operator determines reference to the Pre-Plan is not required **EXAMINER'S NOTE: The operator has received a report that there is no fire.** COMMENTS:	____ SAT ____ UNSAT
STEP 24: VERIFY the plant is in a safe condition corresponding to the existing or potential consequences of the fire on safe plant condition. (Step 6.3.9) STANDARD: Plant is steady-state. Control Room HVAC is secured. **EXAMINER'S NOTE: The operator may consider starting the other train of Control Room HVAC.** **BOOTH INSTRUCTOR CUE: As the FB leader, call the CR and report fire suppression equipment can be restored to normal operational status.** COMMENTS:	____ SAT ____ UNSAT
STEP 25: IF the fire is in the Control Room, Auxiliary Building or CV, THEN refer to DSP-001 entry conditions. (Step 6.3.10) STANDARD: N/A, fire is not in the Control Room, Auxiliary Building, or CV COMMENTS:	____ SAT ____ UNSAT

STEP 26: IF a "confirmed" fire is located in any Reactor Auxiliary Building fire area, THEN verify the associated ventilation equipment is shutdown by either using the equipments's switch OR by opening the supply breaker. (Step 6.3.11) STANDARD: N/A, fire is not located in the Reactor Auxiliary Building. COMMENTS:	____ SAT ____ UNSAT
STEP 27: Implement the EALs (Step 6.3.12) STANDARD: Operator informs the Superintendent Shift Operations to implement the EALs. **EXAMINER'S CUE: Acknowledge (as the Superintendent Shift Operations) to implement the EALs** COMMENTS:	____ SAT ____ UNSAT
STEP 28: Notify the RESS Duty Manager, who will notify the RESS Fire Protection Staff and other RESS personnel as necessary. (CR 96-01227) (Step 6.3.13) STANDARD: Operator informs the Control Room supervision to notify the RESS Duty Manager. **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step was already performed** COMMENTS:	____ SAT ____ UNSAT
STEP 29: IF there is a large or unusual fire AND the Team Leader requests assistance, THEN immediately call in off-shift Fire Brigade members. A Team Leader should be called in for each four Fire Brigade members. If Hartsville Fire Department assistance is needed, see Attachment 7.2. (Step 6.3.14) STANDARD: Operator determines no assistance required. **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step was already performed** COMMENTS:	____ SAT ____ UNSAT

STEP 30: IF it is necessary to admit an emergency vehicle(s) into the Protected Area THEN use the following guidelines to expedite entry (SP-008): (Step 6.3.15) STANDARD: Operator determines no emergency vehicles required to enter the Protected Area. **BOOTH INSTRUCTOR'S CUE: As the Fire Brigade Leader, call the Control Room and recommend sounding the ALL CLEAR** **EXAMINER' NOTE: 5 seconds not included as critical task** COMMENTS:	____ SAT ____ UNSAT
STEP 31: IF the fire involves potentially hazardous materials, THEN ensure that the fire brigade activities are limited to fire suppression and spill confinement. (Step 6.3.16) STANDARD: Operator determines no hazardous materials are involved. COMMENTS:	____ SAT ____ UNSAT
STEP 32: IF the situation involves hazardous materials, THEN perform the following: (Step 6.3.17) STANDARD: Operator determines no hazardous materials are involved. COMMENTS:	____ SAT ____ UNSAT
STEP 33: WHEN recommended by the Fire Brigade Team Leader, THEN sound the ALL CLEAR alarm for 5 seconds and announce the status of the fire (ACR 94-614) (Step 6.3.18) STANDARD: ALL CLEAR alarm sounded for 5 seconds by placing the control switch in the ALL CLEAR position and back to MID COMMENTS:	____ SAT ____ UNSAT

STEP 34: WHEN the fire is extinguished, THEN direct recovery to normal plant operation giving consideration to the following: (Step 6.3.19) • Need for fire watches while fire detection and suppression systems are out of service. • Restoring fire detection and fire suppression systems to normal operational alignment in accordance with governing system Operating Procedures. STANDARD: Electric Motor Driven Fire Pump secured by placing the control switch on Containment FP System Panel to the left position and observing the green light illuminated COMMENTS:	____ SAT ____ UNSAT
STEP 35: VERIFY post fire activities include the preservation of evidence and the fire scene IAW PLP-113. (CR 96-01227) (Step 6.3.20) STANDARD: Operator directs the Fire Brigade Team Leader to VERIFY post fire activities include the preservation of evidence and the fire scene IAW PLP-113. **EXAMINER'S CUE: JPM is complete.** COMMENTS: **END OF TASK**	____ SAT ____ UNSAT

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the immediate actions for a Reactor Trip or Safety Injection IAW PATH-1
000*007*R5*01

Alternate Path:

Reactor will not automatically trip when required
Reactor will not trip from the right hand side pushbutton
Turbine will not trip from the RTGB

Facility JPM #:

JPM CR-110
RO / SRO

K/A Rating(s):

004 A4.18	4.3/4.1	029 EA1.09	4.0/3.6
000 EA1.01	3.4/3.1	029 EA1.12	4.1/4.0
000 EA1.08	4.5/4.5	029 EA1.14	4.2/3.9
000 EA1.09	4.0/3.6	029 EA1.15	4.1/3.9
000 EA1.12	4.1/4.0	029 EA2.05	3.4/3.4
000 EA1.13	4.1/3.9	029 EA2.07	4.2/4.3
029 EA1.01	3.4/3.1	2.4.49	4.0/4.0

Task Standard:

Immediate actions associated with an ATWS condition performed IAW PATH-1

Preferred Evaluation Location: Simulator __X__ In-Plant _____

Preferred Evaluation Method: Perform __X__ Simulate _____

References:

PATH-1

Validation Time: 10 min. **Time Critical:** No

Candidate: ____________________________
NAME

Overall Time
Start: __________
Finish: __________

Performance Time (min): __________

Examiner: ____________________ ____________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because operator must determine an automatic reactor trip signal was initiated and the reactor failed to trip

Step 6
Critical because prompt operator action is required (by memory) to insert negative reactivity to the reactor

Step 8
Critical because prompt operator action is required (by memory) to trip/runback the turbine in the event of a failure of the turbine to trip

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-5, go to RUN and then FREEZE.

2. When the examiner directs, go to RUN, **THEN** activate CAEP 88_JPM_CR_004_R7_POTEET

SIMULATOR OPERATOR INSTRUCTIONS:

The CAEP has the following triggers included:

- E3 (88_JPM_CR_004_3): When the left hand side Reactor Trip pushbutton is depressed, the reactor trip breakers will open
- E2 (88_JPM_CR_004_2): When Control Bank "D" reaches 208 steps, the reactor trip breakers will open. (This trigger provides a contingency in case the operator drives rods instead of depressing both pushbuttons.)

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

PATH-1

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The unit is at 100% power. All controls are in auto/normal. No equipment is out-of-service.
2. You are the Reactor Operator and the BOP (the BOP has left the Control Room).

INITIATING CUES:

You are to respond to events as they occur

START TIME: _______

EXAMINER'S NOTE: This scenario starts at 100% power. Approximately 20 seconds after the simulator is placed in RUN, an 800 gpm RCS leak will occur. The operator will attempt to respond to annunciators as they occur. A second Charging Pump may be started to address excessive RCS leakage. The annunciators and bistables associated with OTΔT will alarm, however the runback and reactor trip will fail to occur. The operator should then realize an ATWS event is occurring.

STEP 1: APP-003-F4, CHG PMP HI SPEED alarms due to lowering RCS pressure STANDARD: Operator: • acknowledges/silences alarm • determines RCS pressure is decreasing by observing PI-444, 445, 455, 456, 457 • determines PZR level is decreasing by observing LI-460, 461, 459A • will check APP-003-F4 may start an additional Charging Pump may enter AOP-016 **BOOTH INSTRUCTOR'S NOTE: Initiate 800 gpm RCS Leak ~20 seconds after the simulator is placed in RUN. IMF RCS09A ... 800** COMMENTS:	____ SAT ____ UNSAT
STEP 2: The following annunciators alarm due to lowering RCS pressure and level: • APP-003-D8, PZR CONTROL HI/LO PRESS • APP-003-E8, PZR CONTROL HI/LO LVL STANDARD: Operator determines: • RCS leakage in progress • starts a second (or third) Charging Pump • all PZR Heaters are energized, Spray valves are closed • entry into AOP-016, Excessive RCS Leakage is required **EXAMINER'S NOTE: Operator may attempt manual reactor trip due to rapid RCS pressure reduction** COMMENTS:	____ SAT ____ UNSAT

STEP 3: APP-005-D5, OPΔT/OTΔT TURBINE RUNBACK ROD STOP alarms due to lowering RCS pressure STANDARD: Operator determines: • OTΔT Rod Stop and Turbine Runback setpoint & coincidence satisfied • Turbine Runback not in progress **EXAMINER'S NOTE: Due to the pace of the transient, the operator may not have time to diagnose the runback.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: APP-004 - E3, OVERTEMP ΔT TRIP (First Out Annunciator) alarms STANDARD: Operator determines the reactor failed to automatically trip by observing: • the First Out Annunciator and / or • the Reactor Trip Breaker red & green breaker indicating lights extinguished **EXAMINER'S NOTE: PZR pressure ~ 2080 psig RCS Tave ~ 574°F** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 5: REACTOR TRIPPED: (Step 1) STANDARD: The operator determines the reactor is not tripped • Reactor Trip Main Breakers - no indication • Rod Position indication CBD-218 • Rod Bottom lights NOT illuminated • Neutron Flux ~ 100% COMMENTS:	____ SAT ____ UNSAT

STEP 6: TRIP REACTOR (Step 1 RNO) STANDARD: The operator depresses the pushbuttons on the RTGB. The reactor trips after the left hand pushbutton is depressed COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: TURBINE TRIPPED: (Step 2) STANDARD: The operator determines the Turbine is NOT Tripped • Both Turbine Stop valves are open • All Governor valves indicate open COMMENTS:	____ SAT ____ UNSAT

STEP 8: TRIP OR RUNBACK TURBINE (Step 2 RNO)
 	
STANDARD: Operator:
• depresses the THINK and TURBINE TRIP pushbuttons and determines the turbine will not trip by observing the Stop and Governor valves open
• manually runs back the turbine by depressing the following pushbuttons on the EH Turbine Control Panel:
  • LIMIT ⇓
    OR
  • GV ⇓ AND GV FAST
 	
COMMENTS:
	CRITICAL STEP
	
	____ SAT
	
	____ UNSAT

STEP 9: E1 AND E2 ENERGIZED (Step 3) STANDARD: Operator determines E1 and E2 are energized by observing the red breaker closed lights on the RTGB at switches for E1 & E2 480V BUS MAIN (52/18B & 28B) COMMENTS:	____ SAT ____ UNSAT

<u>STEP 10</u>: SI INITIATED (Step 4)

<u>STANDARD</u>: Operator determines SI has initiated by observing any of the following:

- APP-004-D1, PZR LO PRESS SFGRD/TRIP
- SI Pumps running
- Emergency Diesel Generator White Start light illuminated

____ SAT

____ UNSAT

EXAMINER'S NOTE: RCS pressure ~ 1100 psig

<u>EXAMINER'S CUE</u>: After the operator states Immediate Actions are complete, terminate the JPM

<u>COMMENTS</u>:

END OF TASK

TIME STOP: ________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Shift Auxiliary Feedwater Pump Suction to Service Water.
000*054*R5*01
061*007*R1*04

Alternate Path:

N/A

Facility JPM #:

JPM IP-002
AO / RO / SRO

K/A Rating(s):

061 K1.07	3.6/3.8
054 AA1.01	4.5/4.4

Task Standard:

Auxiliary Feedwater Pump Suction aligned to Service Water IAW OP-402, Section 8.1

Preferred Evaluation Location:

Simulator ______ In-Plant __X__

Preferred Evaluation Method:

Perform ______ Simulate __X__

References:

1. OP-402, Section 8.1
2. EOP Path-1, Foldout A.

Validation Time: 15 min. **Time Critical:** Yes (15 min.)

Candidate: ______________________________
NAME

Overall Time
Start: __________
Finish: __________

Critical Time
Start: __________
Finish: __________

Performance Time (min): _______ __________

Examiner: ______________________ ____________________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 3
Critical because CST must be isolated to provide Emergency B/U suction from SW.

Step 4
Critical because CST must be isolated to provide Emergency B/U suction from SW.

Step 5
Critical because AFW-24A must be closed to prevent SW from flowing into CCW Pump Room and filling Sump/WHUT.

Step 6
Critical because AFW-24 must be open to provide SW flow to AFW Pumps Suction.

Step 7
Critical because SW-118 must be open to provide SW flow to AFW Pumps Suction.

Step 9 (SRO ONLY)
Critical because "B" AFW must be started to provide AFW flow .

Tools/Equipment/Procedures Needed:

OP-402, Section 8.1 with Step 8.1.1 completed.
The operator would require a Locked Valve Key to simulate unlocking valves.

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

INITIAL CONDITIONS:

1. You are an extra Reactor Operator. **(ROs ONLY)**
   You are the Work Control Center SRO **(SROs ONLY)**
2. The plant is currently in MODE 4 and cooling down to Mode 5 due to a ruptured Condensate Storage Tank.
3. The SDAFW is OOS for maintenance.
4. Both MDAFW pumps have been stopped.
5. Step 8.4.1.1 of OP-402 is complete

INITIATING CUES:

ROs ONLY:
You have been dispatched from the Control Room to establish Service Water as the suction supply to the Auxiliary Feedwater system in accordance with OP-402, Section 8.1 up to but not including venting AFW Pumps.

SROs ONLY:
You have been dispatched from the Control Room to establish Service Water as the suction supply to the Auxiliary Feedwater system in accordance with OP-402, Section 8.1 up to and including starting "A" AFW Pump.

START TIME: _______ **TIME CRITICAL START TIME:** ________

<u>EP 1</u>: Verify the AFW Pumps are STOPPED (Step 8.4.1.2.a) • SDAFW • MDAFW Pump "A" • MDAFW Pump "B" <u>STANDARD</u>: Operator determines all AFW Pumps are stopped from initial conditions **<u>EXAMINER'S CUE:</u> If operator calls the Control Room to verify all AFW Pumps are stopped, inform him/her all are stopped.** <u>COMMENTS</u>:	___ SAT ___ UNSAT

NOTE: Closing AFW-1, AFW PUMPS SUCTION FROM CST <u>OR</u> AFW-104, AFW PUMPS SUCTION FROM CST in the next step renders the AFW pumps inoperable (ITS LCO 3.7.4 and ITS SR 3.7.4.1)

<u>STEP 2</u>: Notify the CRSS/SSO that an Action Statement will be entered and record the time (Step 8.4.1.2.b) <u>STANDARD</u>: Operator contacts the CRSS/SSO and informs him the Action Statement will be entered and records the time **XAMINER'S CUE: The CRSS/SSO acknowledges the report from the Operator.** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 3</u>: Unlock <u>AND</u> close AFW-1, AFW PUMPS SUCTION FROM CST (Step 8.4.1.2.c.1) <u>STANDARD</u>: Operator simulates unlocking and closing AFW-1 by turning the handwheel in the fully clockwise direction and observing stem insertion **EXAMINER'S NOTE: Location: At CST** **EXAMINER'S CUE: AFW-1 is unlocked and the valve stem is fully inserted and valve will not travel any further in the clockwise direction** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 4: Unlock AND close AFW-104, AFW PUMPS SUCTION FROM CST (Step 8.4.1.2.c.2) STANDARD: Operator simulates unlocking and closing AFW-104 by turning the handwheel in the fully clockwise direction and observing stem fully inserted **EXAMINER'S NOTE: Location: At CST** **EXAMINER'S CUE: AFW-104 is unlocked and the valve stem is fully inserted and valve will not travel any further in the clockwise direction** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Close AFW-24A, AFW SUCTION FROM SW EMERGENCY B/U TELL-TAIL DRAIN (Step 8.4.1.2.c.3) STANDARD: Operator simulates closing AFW-24A by turning the handwheel in the fully clockwise direction and observing stem fully inserted **EXAMINER'S NOTE: Location: CCW HX Room** **EXAMINER'S CUE: AFW-24A valve stem is fully inserted and valve will not travel any further in the clockwise direction** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Unlock AND open AFW-24, AFW SUCTION FROM SW EMERGENCY B/U (Step 8.4.1.2.c.4) STANDARD: Operator simulates unlocking and opening AFW-24 by turning the handwheel in the fully counter-clockwise direction and observing stem fully withdrawn, then turning ~1/2 turn clockwise to remove from backseat **EXAMINER'S NOTE: Location: CCW HX Room** **EXAMINER'S CUE: AFW-24 valve stem is fully withdrawn, and valve will not travel any farther in the counter-clockwise direction (and removed from the backseat if the operator performs this action)** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 7:	Unlock AND open SW-118, SW EMERGENCY B/U TO AFW SUCTION (Step 8.4.1.2.c.5)	**CRITICAL STEP**
STANDARD:	Operator simulates unlocking and opening SW-118 by turning the handwheel in the fully counter-clockwise direction and observing stem fully withdrawn, then turning ~1/2 turn clockwise to remove from backseat	___ SAT
EXAMINER'S NOTE:	**Location: CCW HX Room**	___ UNSAT
EXAMINER'S CUE:	**SW-118 valve stem is fully withdrawn and valve will not travel any farther in the counter-clockwise direction (and removed from the backseat if the operator performs this action)**	
COMMENTS:		
	ROs ONLY: END OF TASK	

TIME CRITICAL STOP TIME: __________

(ROs ONLY) STOP TIME: _________

NOTE: The following list is the maximum TOTAL allowable feed flow rates for various pump combinations. These flow rates when added to the 90 gpm seal leak off flow and 165 gpm recirc flow for the SDAFW Pump or 60 gpm recirc flow for each MDAFW pumps will prevent exceeding 600 gpm total. The Service Water System is designed to supply a maximum of 600 gpm as a backup source of water to AFW.

2 MDAFW pumps (not to exceed 325 gpm/pump)	480 gpm
SDAFW pump (only)	345 gpm
1 MDAFW pump	325 gpm

(The 325 gpm/pump limitation is to prevent tripping the pump on overcurrent.)

STEP 8:	IF SDAFW Pump is to be used, THEN perform the following: (Step 8.4.1.2.d)	
STANDARD:	Operator determines the SDAFW Pump is OOS per the initial conditions and marks steps 8.4.1.2.d.1.a through e N/A.	___ SAT
COMMENTS:		___ UNSAT

CAUTION: If the starting limitation stated in the Precautions and Limitations Section are exceeded, motor damage can occur due to motor overheating.

NOTE: The maximum flow rate when RCS temperature is less than or equal to 350 °F is 100 gpm.

STEP 9: IF MDAFW Pump "A" is to be used, THEN perform the following: (Step 8.4.1.2.d.2)

1. Remove cap from AFW-34, AFW PUMP "A" VENT.
2. Open AFW-34.
3. WHEN a solid stream of water issues, THEN close AFW-34.
4. Start MDAFW Pump "A".

STANDARD: Operator:

a. simulates removing the cap from AFW-34 by placing a pipe wrench on it and turning in the counter clockwise until it can be removed by hand.
b. simulates opening AFW-34 by turning the handwheel in the counter clockwise direction.
c. simulates closing AFW-34 when a solid stream of water issues.
d. calls the Control Room and requests they start the "A" AFW Pump.

EXAMINER'S CUE:

1. **Pipe cap removed**
2. **AFW-34 is open or throttled open, depending on operator action**
3. **After a few seconds, a solid stream of water is issuing from the end of the pipe. After the operator simulates closing AFW-34, report that the handwheel is fully clockwise.**
4. **Respond as the Control Room and acknowledge "Start the "A" MDAFW Pump.**
   - **A few seconds later, inform the operator the "A" MDAFW Pump is running. The room is noisy, pump/motor is spinning.**
   - **HVH-7B started (Ventilation Fan for the "A"MDAFW Pump).**

EXAMINER'S CUE: End of JPM.

EXAMINER'S NOTE: Location: AFW Pump Room

COMMENTS:

CRITICAL STEP

___ SAT

___ UNSAT

(SROs ONLY) STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

ROs ONLY

INITIAL CONDITIONS:

1. You are an extra Reactor Operator.
2. The plant is currently in MODE 4 and cooling down to Mode 5 due to a ruptured Condensate Storage Tank.
3. The SDAFW is OOS for maintenance.
4. Both MDAFW pumps have been stopped.
5. Step 8.4.1.1 of OP-402 is complete

INITIATING CUES:

You have been dispatched from the Control Room to establish Service Water suction supply to the Auxiliary Feedwater system in accordance with OP-402, Section 8.1 up to but not including venting AFW Pumps.

REGION II
JOB PERFORMANCE MEASURE

Task:

Restore AC Power At The EDG Engine Control Panel IAW EPP-1, Attachment 6
000*055*R5*01

Alternate Path:

"A" EDG unavailable, cannot be started
"B" EDG will not start from local control panel
Breaker 52/27B failed to automatically close

Facility JPM #:

JPM IP-048
AO / RO / SRO

K/A Rating(s):

064 A4.01	4.0/4.3
064 A4.06	3.9/3.9
055 EA1.02	4.3/4.4
055 EA1.06	4.1/4.5

Task Standard:

E-2 energized from "B" Emergency Diesel Generator IAW EPP-1 Attachment 6, RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator ______ In-Plant __X__ Perform ______ Simulate __X__

References:

EPP-1, Attachment 6, RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL

Validation Time: 18 min. **Time Critical:** Yes (12 min.)

Operator: ________________________ NAME

	Overall Time	Critical Time
Start:	________	________
Finish:	________	________
Performance Time (min):	________	________

Performance Rating: SAT ________ UNSAT ________

Examiner: ________________________ ________________________ / ________
NAME SIGNATURE DATE

COMMENTS

Steps 1 - 13
Time critical because restoration of power to at least 1 safety-related bus is required in a timely manner to prevent RCP Seal degradation

Step 1
Critical because control must be transferred to local to enable start pushbutton

Step 2
Critical because operator action is required to locally start the EDG

Step 6
Critical because de-energizing the air start solenoids causes the diesel engine to start

Step 7
Critical because operator action is required to manually isolate Starting Air to the EDG (ensures EDG can carry full load)

Step 11
Critical because transition to the RNO is based on recognizing the "B" EDG output breaker is open

Step 12
Critical because the synchroscope switch is interlocked with the local close switch for 52/27B

Step 13
Critical because operator action is required to manually close the EDG "B" output breaker to supply the E-2 Bus.

Tools/Equipment/Procedures Needed:

EPP-1, Attachment 6, RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps , including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Operator Cue Sheet I provided you.

OPERATOR INFORMATION:

Inform the operator that there are time critical steps in this JPM.

INITIAL CONDITIONS:

You are the Inside Auxiliary Operator.

The Unit has experienced a total loss of onsite and offsite AC power.

EOP procedure EPP-1 (Loss of AC Power) has been implemented.

"A" Emergency Diesel Generator is out of service and under clearance.

"B" Emergency Diesel Generator failed to automatically start.

INITIATING CUES:

In accordance with EPP-1, Step 7, the Control Room Shift Supervisor (CRSS) has directed you to place the "B" EDG Control Switch in the LOCAL position, depress the START pushbutton, and report back as soon as possible.

START TIME: ________ **TIME CRITICAL START TIME:** ________

EVALUATOR NOTE:
Steps 1 through 13 are time critical.
Record the CRITICAL START TIME as time the operator enters the "B" EDG Room.

EPP-1 STEP 1: Place the EDG Control Switch in the LOCAL position (Step 7.b.1 RNO) STANDARD: Operator simulates placing the EDG Control Switch in the LOCAL position and observes the LOCAL CONTROL white light. **EXAMINER'S CUE: The EDG Control Switch is in the LOCAL position. The LOCAL CONTROL white light is illuminated.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Depress the START pushbutton (Step 7.b.2 RNO) STANDARD: Operator simulates depressing the START pushbutton. **EXAMINER'S CUE: When the START pushbutton is depressed, inform the Operator that the EDG is NOT rolling over.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Operator contacts the CRSS to inform him B EDG did not start. STANDARD: Operator determines B EDG did not start and "A" EDG is OOS from initial conditions. Operator contacts the CRSS to inform him B EDG did not start. **EXAMINER'S NOTE: PA is not energized. If Operator uses PA, provide no response. Radio or cell phone are functional.** **EXAMINER'S CUE: Acknowledge report from Operator and instruct him to perform EPP-1, Attachment 6.** COMMENTS:	___ SAT ___ UNSAT

STEP 4: Operator determines need to obtain a copy of EPP-1, Attachment 6. STANDARD: Operator obtains a copy of EPP-1, Attachment 6 from IAO office, WCC, Control Room, or other valid location. **EXAMINER'S NOTE: None.** **EXAMINER'S CUE: When Operator states need to obtain a copy of EPP-1, Attachment 6, ask where he would locate one. If correct, provide copy of EPP-1, Attachment 6.** COMMENTS:	___ SAT ___ UNSAT
EPP-1, Attachment 6 STEP 5: Check EDGs Status - AT LEAST ONE RUNNING. (Step 1) STANDARD: Operator determines "B" EDG did not start by checking local indications and "A" EDG is OOS from initial conditions. Operator proceeds to Step 1, RNO. **EXAMINER'S CUE: Provide the operator cues for the indications that he (she) would check to determine that "B" EDG is NOT running. For example:** **Room is quiet** **Engine not rotating** **Normal lighting de-energized, only emergency lights are illuminated** COMMENTS:	___ SAT ___ UNSAT

<u>STEP 6</u>: Contact the Control Room and request that the following breakers be opened in the Battery Room: (Step 1 RNO) • At 125V DC MCC-A, open Breaker 24, DIESEL GENERATOR "A" CONTROL POWER. • At 125V DC MCC-B, open Breaker 12, DIESEL GENERATOR "B" CONTROL POWER <u>STANDARD</u>: Operator contacts the Control Room to have the following breakers opened in the Battery Room: • At 125V DC MCC-B, open Breaker 12, DIESEL GENERATOR "B" CONTROL POWER. **EXAMINER'S NOTE: Operator may elect to only have breaker associated with B EDG opened since A EDG is under clearance.** **EXAMINER'S CUE: Control Room acknowledges MCC B / Breaker 12 and, if requested, MCC A / Breaker 24 need to be opened.** **(~ 1 minute later) the "B" EDG STARTS (air solenoids fail open).** **Noise level in the room increases** **Control Room reports the requested breakers (above) have been opened** <u>COMMENTS</u>:	<u>**CRITICAL STEP**</u> ___ SAT ___ UNSAT
<u>STEP 7</u>: Unlock And Close Both DG STARTING SOLENOID INLET Valves For Any Running EDG: (Step 2nd bullet) • For EDG B: DA-18B DA-22B <u>STANDARD</u>: Operator simulates unlocking and closing DA-18B and DA-22B by rotating the handwheel in the fully clockwise direction **EXAMINER'S NOTE: "A" EDG starting air valves are closed and under clearance.** **EXAMINER'S CUE: When valves are located and simulated unlocked and closed then inform operator the valves are rotated fully clockwise.** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 8: Close The Output Breaker For EDG "A" As Follows: (Step 3.a) a. Check EDG "A" - RUNNING. STANDARD: Operator determines "A" EDG is not running and proceeds to Step 4 (via the RNO) **EXAMINER'S CUE: If the operator goes into the "A" EDG Room, inform him/her it is very quiet and except for the emergency lights, dark in the room** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Close The Output Breaker For EDG "B" As Follows (Step 4.a) a. Check EDG "B" - RUNNING STANDARD: Operator determines "B" EDG is running. **EXAMINER'S CUE: "B" EDG is running,** COMMENTS:	___ SAT ___ UNSAT
STEP 10: At the DG CONTR. SW BRD. B, check GENERATOR VOLTAGE - APPROXIMATELY 480 VOLTS (Step 4.b) STANDARD: Operator determines "B" EDG Output Voltage is Approximately 480V. **EXAMINER'S CUE: When Operator locates EDG Output Voltage Meter inform him voltage is 480V.** COMMENTS:	___ SAT ___ UNSAT
STEP 11: At the DG CONTR. SW BRD. B, Check EDG OUTPUT BKR 52/27B - CLOSED (Step 4.c) STANDARD: Operator determines breaker 52/27B is not closed and proceeds to step 4.c RNO **EXAMINER'S CUE: Green Light is illuminated and red light extinguished for breaker 52/27B.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 12: Turn the SYNCHROSCOPE Switch for the GENERATOR Breaker to the ON position (Step 4.c.1 RNO) STANDARD: Operator positions Generator Synchroscope switch to the ON position. **EXAMINER'S CUE: The SYNCHROSCOPE Switch for the GENERATOR Breaker is in the ON position. If asked, the synchroscope pointer is at 12:00 and the lights are extinguished.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 13: Close EDG OUTPUT BKR 52/27B. (Step 4.c.2 RNO) STANDARD: Operator simulates momentarily placing the control switch for breaker 52/27B to the close position and determines the breaker closed by observing the red light illuminated, and the green light extinguished **EXAMINER'S NOTE: If operator did not turn on synchroscope, or manipulated the wrong synchroscope, then 52/27B DID NOT Close. DO NOT provide cue below.** **EXAMINER'S CUE: When proper switch is located and operation is simulated, notify Operator that breaker 52/27B red light is illuminated, and green light is extinguished.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME CRITICAL STOP TIME: ________

STEP 14: IF breaker 52/27B will NOT close, THEN Trip EDG "B" (Step 4.c.3 RNO) STANDARD: Operator determines breaker 52/27B is closed by observing the red light illuminated, green light extinguished **EXAMINER'S CUE: None** COMMENTS:	___ SAT ___ UNSAT

STEP 15: Turn the SYNCHROSCOPE Switch for the GENERATOR Breaker to the OFF position (Step 4.c.4 RNO) STANDARD: Operator simulates placing the SYNCHROSCOPE Switch for the GENERATOR Breaker to the OFF position. **EXAMINER'S CUE: The SYNCHROSCOPE Switch for the GENERATOR Breaker to the OFF position.** COMMENTS:	___ SAT ___ UNSAT
STEP 16: Check BOTH EDG Starting Air Receivers - GREATER Than 80 PSIG (Step 5) STANDARD: Operator determines "B" EDG Air Receiver is pressurized to > 80 psig by observing the pressure indicator at the top of the receiver **EXAMINER'S NOTE: Since "A" EDG is OOS, the operator may not check its Air Receiver** **EXAMINER'S CUE: When Operator checks Air Receiver pressure gauge(s) inform him air pressure is 100 psig.** COMMENTS:	___ SAT ___ UNSAT
STEP 17: Perform The Following: (Step 6) a. Notify Control Room that Attachment 6 is complete b. Inform Control Room of EDG AND EDG output breaker status STANDARD: Operator simulates notifying the Control Room that Attachment 6 is complete and "B" EDG is running with it's Output Breaker shut **EXAMINER'S CUE: When Control Room is contacted acknowledge report.** COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME: ________

REGION II

JOB PERFORMANCE MEASURE

Task:

Remove Instrument Air Compressor "D" and Associated Dryer from service

Alternate Path:

N/A

Facility JPM #:

IP-112
AO / RO / SRO

K/A Rating(s):

GEN 2.1.23 3.9/4.0
GEN 2.1.30 3.9/3.4

Task Standard:

Instrument Air Compressor "D" and Associated Dryer removed from Service IAW OP-905 Section 8.3.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

Preferred Evaluation Location:

Simulator ______ In-Plant __X__

Preferred Evaluation Method:

Perform ______ Simulate __X__

References:

OP-905 Section 8.3.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

Validation Time: 12 min. **Time Critical:** No

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ______________________________ ______________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 1
Critical because compressor must be unloaded prior to securing.

Step 2
Critical because stop button must be depressed to accomplish task.

Step 4
Critical because IA-3818 must be shut to prevent potential loss of instrument air due to IAC "D" being secured.

Step 5
Critical because power must be removed to remove the dryer from service.

Tools/Equipment/Procedures Needed:

OP-905 Section 8.3.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE, completed through step 8.3.4.1

READ TO CANDIDATE

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

INITIAL CONDITIONS:

You are the Outside Auxiliary Operator.

The Initial Conditions of OP-905 Section 8.3.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE, have been completed with the Primary Air Compressor in service.

A pre-job briefing has been completed for this task.

INITIATING CUES:

The Control Room Shift Supervisor (CRSS) has directed you to perform OP-905 Section 8.3.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

START TIME: ________

STEP 1: Place the load/unload toggle Switch in the UNLOAD position. (Step 8.3.4.2.a) STANDARD: The load/unload toggle Switch is simulated placed in the UNLOAD position. EXAMINER'S CUE: **After operator locates and simulates placing the load/unload Switch in the UNLOAD position, inform him the switch is in the UNLOAD position.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE: Depressing the STOP pushbutton will cause all local trip alarms to illuminate. Also, APP-002-E7, INSTR AIR CMPR D TRIP, will alarm in the control room.

STEP 2: WHEN 3 seconds has elapsed, THEN depress the STOP pushbutton. (Step 8.3.4.2.b) STANDARD: The operator depresses the STOP pushbutton after at least 3 seconds after placing the load/unload switch in UNLOAD. EXAMINER'S CUE: **If the operator calls the Control Room to inform them to expect APP-002-E7, acknowledge as the Control Room.** **After the operator simulates depressing the STOP pushbutton, inform him that the air compressor has stopped, and local alarms are illuminated.** EXAMINERS'S NOTE: **Since a pre-job briefing was conducted (initial conditions), the operator may not call the Control Room about the expected annunciator** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Verify that the AUTO OPERATION light is extinguished. (Step 8.3.4.2.c) STANDARD: The operator determines the AUTO OPERATION light is extinguished EXAMINER'S CUE: **After operator locates the AUTO OPERATION light, inform him it is extinguished.** COMMENTS:	___ SAT ___ UNSAT

STEP 4: Close IA-3818, IA DRYER "D" DISCHARGE. (Step 8.3.4.2.d) STANDARD: The operator simulates closing IA-3818, IA DRYER "D" DISCHARGE by turning the handle perpendicular to the piping. **EXAMINER'S CUE: After operator locates IA-3818 and simulates closing valve, inform him the valve that valve handle is perpendicular to the pipe.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Place IA DRYER "D" POWER switch to the OFF position. (Step 8.3.4.2.e) STANDARD: The operator simulates placing IA DRYER "D" POWER switch to the OFF position. **EXAMINER'S CUE: When IA DRYER "D" POWER switch is located and operation is simulated, inform operator that OFF is displayed in the power switch window.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Throttle open the following valves to remove condensation then close the valves: IA-3832, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. (Step 8.3.4.2.f 1st bullet) STANDARD: The operator simulates opening then closing IA-3832, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. **EXAMINER'S CUE: After operator locates valve and simulates opening/throttling valve, inform him the valve has been rotated counter-clockwise.** **After operator simulates closing valve, inform him the valve cannot be rotated any further clockwise.** COMMENTS:	___ SAT ___ UNSAT

STEP 7: IA-3833, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. (Step 8.3.4.2 2nd bullet) STANDARD: The operator simulates opening then closing IA-3833, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. EXAMINER'S CUE: **After the operator locates valve and simulates opening/throttling valve, inform him the valve has been rotated counter-clockwise.** **After the operator simulates closing valve, inform him the valve cannot be rotated any further clockwise.** COMMENTS:	___ SAT ___ UNSAT
STEP 8: IA-3824, IA DRYER "D" TRAP MANUAL DRAIN. (Step 8.3.4.2.f 3rd bullet) STANDARD: The operator simulates opening then closing IA-3824, IA DRYER "D" TRAP MANUAL DRAIN by turning the handle parallel to the pipe to open then perpendicular to the pipe to close the valve. EXAMINER'S CUE: **After the operator locates valve and simulates opening/throttling valve, inform him the valve handle is aligned in-line (parallel) with its piping.** **After the operator simulates closing valve, inform him the valve handle is perpendicular with its piping.** COMMENTS:	___ SAT ___ UNSAT
STEP 9: IA-3667, IA RECEIVER "D" STRAINER DRAIN. (Step 8.3.4.2.f 4th bullet) STANDARD: The operator simulates opening then closing IA-3667, IA RECEIVER "D" STRAINER DRAIN by turning the handle parallel to the pipe to open then perpendicular to the pipe to close the valve. EXAMINER'S CUE: **After the operator locates IA-3667 and simulates opening/throttling valve, inform him the valve handle is aligned in-line (parallel) with its piping.** **After the operator simulates closing valve, inform him the valve handle is perpendicular with its piping.** COMMENTS:	___ SAT ___ UNSAT

STEP10: IA-3826, IA DRYER "D" AIR LINE DRAIN. (Step 8.3.4.2.f 5th bullet) STANDARD: The operator simulates opening then closing IA-3826, IA DRYER "D" AIR LINE DRAIN. **EXAMINER'S CUE: After the operator locates IA-3826 and simulates opening/throttling valve, inform him the valve handle is aligned in-line (parallel) with its piping.** **After the operator simulates closing valve, inform him the valve handle is perpendicular with its piping.** COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME: _____

ROBINSON

INITIAL EXAM

SUBMITTAL

Facility: H. B. Robinson Date of Examination: 7/22/99

Item	Task Description	Initials a	b*	c
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	GP	TN	
	b. Assess whether the outline was systematically prepared and whether all knowledge and ability categories are appropriately sampled.	GP	TN	
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	GP	TN	
	d. Assess whether the repetition from previous examination outlines is excessive.	GP	TN	
2. SIM	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.	GP	TN	
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated over successive days.	GP	TN	
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	GP	TN	
3. W/T	a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test material is repeated from the last NRC examination, (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks.	GP	TN	
	b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) 40% of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA.	GP	TN	
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	GP	TN	
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on successive days.	GP	TN	
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	GP	TN	
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	GP	TN	
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	GP	TN	
	d. Check for duplication and overlap among exam sections.	GP	TN	
	e. Check the entire exam for balance of coverage.	GP	TN	
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	GP	TN	

	Printed Name / Signature	Date
a. Author	Gregory S. Pirret / Gregory S. Pirret	6-8-99
b. Facility Reviewer(*)	Thomas J. Natale / Th Natale	6-9-99
c. Chief Examiner		
d. NRC Supervisor		

(*) Not applicable for NRC-developed examinations.

Facility: H. B. Robinson Date of Examination: 7-26-99 Operating Test Number:

1. GENERAL CRITERIA		Initials a	Initials b	Initials c
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).	SP	TN	
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.	SP	TN	
c.	The operating test shall not duplicate items from the applicants' audit test(s)(see Section D.1.a).	SP	TN	
d.	Overlap with the written examination and between operating test categories is within acceptable limits.	SP	TN	
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.	SP	TN	
2. WALK-THROUGH (CATEGORY A & B) CRITERIA		–	–	–
a.	Each JPM includes the following, as applicable: · initial conditions · initiating cues · references and tools, including associated procedures · validated time limits (average time allowed for completion) and specific designation if deemed to be time critical by the facility licensee · specific performance criteria that include: - detailed expected actions with exact criteria and nomenclature - system response and other examiner cues - statements describing important observations to be made by the applicant - criteria for successful completion of the task - identification of critical steps and their associated performance standards - restrictions on the sequence of steps, if applicable	SP	TN	
b.	The prescripted questions in Category A are predominantly open reference and meet the criteria in Attachment 1 of ES-301.	SP	TN	
c.	Repetition from operating tests used during the previous licensing examination is within acceptable limits (30% for the walk-through) and do not compromise test integrity.	SP	TN	
d.	At least 20 percent of the JPMs on each test are new or significantly modified.	SP	TN	
3. SIMULATOR (CATEGORY C) CRITERIA		–	–	–
a.	The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.	SP	TN	

	Printed Name / Signature	Date
a. Author	Gregory S Petect / Gregory S Petect	6-8-99
b. Facility Reviewer(*)	Thomas J. Natale / Th Natale	6-9-99
c. NRC Chief Examiner (*)		
d. NRC Supervisor (*)		

(*) The facility signature is not applicable for NRC-developed tests; two independent NRC reviews are required.

	ISS 98-1-1	ISS 98-1-2	ISS 98-1-3		Totals
R	1, 4r	1, 6	1, 3		6
N	1	1, 6	1		4
I	3r, 7b	4r, 7b	9r, 6b, 4r		7
C	2, 4b, 5	2r, 3, 5, 9r	2, 3, 5		10
M	6	8	7, 8		4

Candidate

McDonald	ISS 98-1-1 (SRO)	ISS 98-1-2	ISS 98-1-3		Totals
R	1, 4				2
N	1				1
I	3, 7				2
C	2, 4, 5				3
M	6				1

Candidate

Harshaw	ISS 98-1-1 (RO)	ISS 98-1-2 (BOP)	ISS 98-1-3 (SRO)		Totals
R	1, 4	1, 6	1, 3		6
N	1	1, 6	1		4
I	3	7	4, 6, 9		5
C	2, 5	3, 5	2, 3, 5		7
M	6	8	7, 8		4

Candidate

Leeth	ISS 98-1-1 (BOP)	ISS 98-1-2 (RO)	ISS 98-1-3 (BOP)		Totals
R	1	1, 6	1, 3		5
N	1	1, 6	1		4
I	7	4	6		3
C	2, 4, 5	2	2, 3, 5		7
M	6	8	7, 8		4

Candidate

Blaker	ISS 98-1-1 (SRO)	ISS 98-1-2 (SRO)	ISS 98-1-3 (RO)		Totals
R	1, 4	1, 6	1, 3		6
N	1	1, 6	1		4
I	3, 7	4, 7	4, 9		6
C	2, 4, 5	2, 3, 5	2, 3, 5		9
M	6	8	7, 8		4

Candidate

Grant	ISS 98-1-1 (RO)	ISS 98-1-2	ISS 98-1-3 (BOP)		Totals
R	1, 4		1, 3		4
N	1		1		2
I	3		6		2
C	2, 5		2, 3, 5		5
M	6		7, 8		3

Candidate

Sanders	ISS 98-1-1 (BOP)	ISS 98-1-2	ISS 98-1-3 (RO)		Totals
R	1		1, 3		3
N	1		1		2
I	7		4, 9		3
C	2, 4, 5		2, 3, 5		6
M	6		7, 8		3

Candidate

Schwier	ISS 98-1-1	ISS 98-1-2	ISS 98-1-3 (SRO)		Totals
R			1, 3		2
N			1		1
I			4, 6, 9		3
C			2, 3, 5		3
M			7, 8		2

Author: Gregory S. Pick Chief Examiner: ____________

Competencies	Applicant #1 SRO-U McDonald			Applicant #2 SRO-I Harshaw			Applicant #3 RO Leeth		
	SCENARIO			SCENARIO			SCENARIO		
	1 (S)	2	3	1 (R)	2 (B)	3 (S)	1 (B)	2(R)	3 (B)
Understand and Interpret Annunciators and Alarms	3, 4 5, 6, 7	[redacted]	[redacted]	3, 4 5, 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 7, 9	3, 4 5, 6, 7	2, 3 5, 6 7	1, 2, 3, 6, 8
Diagnose Events and Conditions	3, 5 6, 7	[redacted]	[redacted]	3, 5 6, 7	4, 5 6, 7	3, 4, 5, 7, 8, 9	3, 5 6, 7	2, 3 4, 5, 6 7	3, 6, 7, 8
Understand Plant and System Response	3, 4 5, 6	[redacted]	[redacted]	3, 4 5, 6	2, 4 5, 6, 7	3, 4, 5, 6, 7, 8, 9	3, 4 5, 6	2, 3 4, 5, 6 7	1, 2, 3, 6, 7, 8
Comply With and Use Procedures (1)	2, 5 6, 7	[redacted]	[redacted]	2, 5 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	2, 5 6, 7	2, 3 5, 6 7	1, 2, 3, 5, 6, 7, 8
Operate Control Boards (2)		[redacted]	[redacted]	1, 2, 3, 6, 7	2, 4 5, 6, 7		1, 2, 4, 5, 6 7	2, 3 4, 5, 6 7	1, 2, 3, 6, 7, 8
Communicate and Interact With the Crew	2, 3 4, 5	[redacted]	[redacted]	2, 3 4, 5	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	2, 3 4, 5	2, 3 4, 5, 6 7	1, 2, 3, 5, 6, 7
Demonstrate Supervisory Ability (3)	1, 2, 3 4, 5, 6 7	[redacted]	[redacted]	1, 2, 3 4, 5, 6 7		1, 2, 3 4, 5, 6 7, 8	1, 2, 3 4, 5, 6 7		
Comply With and Use Tech. Specs. (3)	2	[redacted]	[redacted]	2		1, 2, 3 4, 5, 6 7			

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SRO's.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: Gregory S. [signature]

Chief Examiner: ______________________

Competencies	Applicant #4 SRO-I Blaker			Applicant #5 RO Grant			Applicant #6 RO Sanders		
	SCENARIO			SCENARIO			SCENARIO		
	1 (S)	2 (S)	3 (R)	1 (R)	2	3 (B)	1 (B)	2	3 (R)
Understand and Interpret Annunciators and Alarms	3, 4 5, 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 7, 9	1, 2, 3, 4, 6		1, 2, 3, 6, 8	3, 4 5, 6, 7		1, 2, 3, 4, 5, 7, 8, 9
Diagnose Events and Conditions	3, 5 6, 7	4, 5 6, 7	3, 4, 5, 7, 8, 9	2, 3, 4, 6		3, 6, 7, 8	3, 5 6, 7		2, 3, 4, 5, 7, 8, 9
Understand Plant and System Response	3, 4 5, 6	2, 4 5, 6, 7	3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4 6		1, 2, 3, 6, 7, 8	3, 4 5, 6		1, 2, 3, 4, 5, 7, 8, 9
Comply With and Use Procedures (1)	2, 5 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 6		1, 2, 3, 5, 6, 7, 8	2, 5 6, 7		1, 2, 3, 4, 5, 7, 8, 9
Operate Control Boards (2)		2, 4 5, 6, 7		1, 2, 3, 4, 6		1, 2, 3, 6, 7, 8	1, 2, 4, 5, 6 7		1, 2, 3, 4, 5, 7, 8, 9
Communicate and Interact With the Crew	2, 3 4, 5	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3 4, 6		1, 2, 3, 5, 6, 7	2, 3 4, 5		1, 2, 3, 4, 5, 7, 8, 9
Demonstrate Supervisory Ability (3)	1, 2, 3 4, 5, 6 7		1, 2, 3 4, 5, 6 7, 8				1, 2, 3 4, 5, 6 7		
Comply With and Use Tech. Specs. (3)	2		1, 2, 3 4, 5, 6 7						

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SRO's.

Instructions: Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: Gregory S. [signature]

Chief Examiner:

Competencies	Applicant #7 SRO-U Schwier								
	SCENARIO								
	1	2	3 (S)						
Understand and Interpret Annunciators and Alarms			1, 2, 3, 4, 5, 7, 9						
Diagnose Events and Conditions			3, 4, 5, 7, 8, 9						
Understand Plant and System Response			3, 4, 5, 6, 7, 8, 9						
Comply With and Use Procedures (1)			1, 2, 3, 4, 5, 6, 7, 8						
Operate Control Boards (2)									
Communicate and Interact With the Crew			1, 2, 3, 4, 5, 6, 7, 8						
Demonstrate Supervisory Ability (3)			1, 2, 3 4, 5, 6 7, 8						
Comply With and Use Tech. Specs. (3)			1, 2, 3 4, 5, 6 7						

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SRO's.

Instructions: Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: [signature]

Chief Examiner: ______________________

Facility: H.B. Robinson   Date of Exam: 7-26-99   Scenario Numbers: 1-1/1-2/1-3   Operating Test No.:

	QUALITATIVE ATTRIBUTES	Initials a	Initials b	Initials c
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.	sf	TN	
2.	The scenarios consist mostly of related events.	sf	TN	
3.	Each event description consists of • the point in the scenario when it is to be initiated • the malfunction(s) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point (if applicable)	sf	TN	
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.	sf	TN	
5.	The events are valid with regard to physics and thermodynamics.	sf	TN	
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	sf	TN	
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.	sf	TN	
8.	The simulator modeling is not altered.	sf	TN	
9.	The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.	sf	TN	
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.	sf	TN	
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	sf	TN	
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).	sf	TN	
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.	sf	TN	

	TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)	Actual Attributes	–	–	–
1.	Total malfunctions (5-8)	9 / 11 / 12	sf	TN	
2.	Malfunctions after EOP entry (1-2)	5 / 5 / 5	sf	TN	
3.	Abnormal events (2-4)	4 / 3 / 4	sf	TN	
4.	Major transients (1-2)	1 / 1 / 2	sf	TN	
5.	EOPs entered/requiring substantive actions (1-2)	3 / 2 / 3	sf	TN	
6.	EOP contingencies requiring substantive actions (0-2)	0 / 1 / 1	sf	TN	
7.	Critical tasks (2-3)	2 / 2 / 4	sf	TN	

Facility: H. B. Robinson Date of Exam: 7-23-99 Exam Level: RO/SRO

	Item Description	Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility	g	TN	
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available	g	TN	
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401	g	TN	
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right — NRC: 0; Other: 0	g	TN	
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]	g	TN	
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right — Bank: ; Modified: ; New: 100	g	TN	
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right — Memory: 48; C/A: 52	g	TN	
8.	References/handouts provided do not give away answers	g	TN	
9.	Question distribution meets previously approved examination outline; deviations are justified	g	TN	
10.	Question psychometric quality and format meet ES, Appendix B, guidelines	g	TN	
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet	g	TN	

	Printed Name / Signature	Date
a. Author	Gregory S. Porter / Gregory S Porter	6-10-99
b. Facility Reviewer(*)	Thomas J Natch / TJ Natch	6-10-99
c. NRC Chief Examiner(*)		
d. NRC Regional Supervisor(*)		

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, 4, 5, and 6.
[ ] The items in brackets do not apply to NRC-prepared examinations.

Facility: H. B. Robinson Unit 2		Date of Exam: July 23, 1999						Exam Level: RO				
Tier	Group	K/A Category Points										Point Total
		K 1	K2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	2	4				1	4			2	16
	2	4	2	4				2	3			2	17
	3	1		2									3
	Tier Totals	8	4	10				3	7			4	36
2. Plant Systems	1	2	1	3	2	2	1	3	2	3	2	2	23
	2	2	2	3	1	2	3	1	2	2	1	1	20
	3	1	1			2	1			2	1		8
	Tier Totals	5	4	6	3	6	5	4	4	7	4	3	51
3. Generic Knowledge and Abilities				Cat 1		Cat 2		Cat 3		Cat 4			
				4		3		3		3			13

Note:
- Attempt to distribute topics among all K/A categories; select at least one topic from every K/A category within each tier.
- Actual point totals must match those specified in the table.
- Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
- Systems/evolutions within each group are identified on the associated outline.
- The shaded areas are not applicable to the category/tier.

Submitted By: Gregory S. Probst / Gregory S Probst Facility Reviewer: Thomas Natale / Thomas Natale

Chief Examiner: ____________________

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1								Form ES-401-4
E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / I			x				AK3.05, Pwr limit misaligned	3.4	1.0
000015/17 RCP Malfunctions / IV						x	Gen.2.1.7, Oper. Judgment based on RCP's	3.7	1.0
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV		x	x				EK2.1 (E09), Nat. circ (control, interlocks, auto/man) EK3.1 (E10), Reason for response (temp, press, reactivity)	3.2 3.3	2.0
000024 Emergency Boration / I									
000026 Loss of Component Cooling Water / VIII									
000027 Pressurizer Pressure Control System Malfunction / III					x		AA2.07, Makeup flow indication (PSA)	3.1	1.0
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	x		x			x	EK1.2, Know. Of AOP/EOP EK3.1, Temp/pressure changes/effects Gen. 2.1.21, Ability to verify a controlled procedure copy	3.5 3.5 3.1	3.0
CE/A11; W/E08 RCS Overcooling - PTS / IV									
000051 Loss of Condenser Vacuum / IV									
000055 Station Blackout / VI	x		x				EK3.01, battery capacity EK1.01, discharge rates	3.3 2.7	2.0
000057 Loss of Vital AC Elec. Inst. Bus / VI				x	x		AA1.03, FW control to control S/G level and press AA2.03, RPS alarms and annunciators	3.6, 3.7	2.0
000062 Loss of Nuclear Service Water / IV									
000067 Plant Fire On-site / IX									
000068 (BW/A06) Control Room Evac. / VIII	x						AK1.01, Use of steam tables (Previous Exam Weakness)	2.4	1.0
000069 (W/E14) Loss of CTMT Integrity / V		x			x		AK2.03, Personnel hatch OST (plant event) AA2.01, Determine loss of integrity	2.8 3.7	2.0
000074 (W/E06&E07) Inad. Core Cooling / IV									
BW/E03 Inadequate Subcooling Margin / IV									
000076 High Reactor Coolant Activity / IX					x		AA2.02, Actions for high activity	2.7	1.0
BW/A02&A03 Loss of NNI-X/Y / VII									
K/A Category Totals:	3	2	4	1	4	2	Group Point Total:		16.0

ES-4[illegible] PWR RO Ex[illegible]ation Outline Form [illegible]01-4

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / I	x					x	AK1.08, Control rod motion Gen 2.4.12, Crew responsibility during emergency	2.9 3.4	2.0
000003 Dropped Control Rod / I									
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / I									
BW/A01 Plant Runback / I									
BW/A04 Turbine Trip / IV									
000008 Pressurizer Vapor Space Accident / III									
000009 Small Break LOCA / III				x			EA1.06, Use computer during a LOCA	3.0	1.0
000011 Large Break LOCA / III					x		EA2.03, LOCA with loss of CCW (PSA)	3.7	1.0
W/E04 LOCA Outside Containment / III			x				EK3.2, EOP/AOP used with LOCA outside CV	3.4	1.0
BW/E08; W/E03 LOCA Cooldown/Depress. / IV									
W/E11 Loss of Emergency Coolant Recirc. / IV		x					EK2.1, Heat removal systems	3.6	1.0
W/E02 SI Termination / III			x				EK3.4, RO functions with Control room team	3.5	1.0
000022 Loss of Reactor Coolant Makeup / II	x						AK1.04, Manual to auto flow control	2.9	1.0
000025 Loss of RHR System / IV									
000029 Anticipated Transient w/o Scram / I						x	Gen 2.4.1, EOP entry conditions (PSA)	4.3	1.0
000032 Loss of Source Range NI / VII	x						AK1.01, Voltage change effect on performance	2.5	1.0
000033 Loss of Intermediate Range NI / VII					x		AA2.12, Maximum channel disagreement	2.5	1.0
000037 Steam Generator Tube Leak / III									
000038 Steam Generator Tube Rupture / III				x			EA1.05, max depressurization rate	4.1	1.0
000054 (CE/E06) Loss of Main Feedwater / IV					x		AA2.05, Status of MFW pumps, RV'sand stop vlvs	3.5	1.0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV			x				EK3.2, EOP/AOP's	3.7	1.0
000058 Loss of DC Power / VI									
000059 Accidental Liquid RadWaste Rel. / IX		x					AK2.02, Radioactive Gas Monitors	2.7	1.0
000060 Accidental Gaseous Radwaste Rel. / IX			x				AK3.02, Aux. Bldg Ventilation during release	3.3	1.0
000061 ARM System Alarms / VII	x						AK1.01, Detector limits	2.5	1.0
W/E16 High Containment Radiation / IX									
CE/E09 Functional Recovery									
K/A Category Point Totals:	4	2	4	2	3	2	Group Point Total:		17.0

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3	Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II			x				AK3.05, EOP Actions	3.7	1.0
000036 (BW/A08) Fuel Handling Accident / VIII									
000056 Loss of Off-site Power / VI			x				AK3.01, Load Sequencer (PSA)	3.5	1.0
000065 Loss of Instrument Air / VIII									
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / VI									
BW/A07 Flooding / VIII									
CE/A16 Excess RCS Leakage / II									
W/E13 Steam Generator Over-pressure / IV	x						EK1.2, AOP's/EOP's used	3.0	1.0
W/E15 Containment Flooding / V									
K/A Category Point Totals:	1		2				Group Point Total:		3.0

PWR RO Examination Outline
Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			x						x			K3.01, CRDS to CVCS A3.04, Radial imbalance	2.9, 3.5	2.0
003 Reactor Coolant Pump							x					A1.02, Pump/Motor bearing temps	2.9	1.0
004 Chemical and Volume Control		x					x					K2.03, Chg pump pwr supplies A1.03, Predict changes in pressure	3.3, 3.8	2.0
013 Engineered Safety Features Actuation			x							x		K3.03, Loss of ESFAS effect on CV A4.01, Equipment fails to actuate	4.3, 4.5	2.0
015 Nuclear Instrumentation	x				x		x					K1.03, NI to CRDS connection K5.02, Compensation operations A1.01, Calibration by heat balance	3.1*, 2.7, 3.5	3.0
017 In-core Temperature Monitor						x						K6.01, Loss of sensor/detector	2.7	1.0
022 Containment Cooling				x								K4.03, Auto CV isolation interlock	3.6	1.0
025 Ice Condenser														
056 Condensate														
059 Main Feedwater								x		x		A2.04, Feeding a dry S/G A4.12, Auto FW isolation	2.9, 3.4	2.0
061 Auxiliary/Emergency Feedwater				x					x			A3.03, AFW S/G lvl cont auto start (PSA) K4.04, prevent AFW pump runout (PSA)	3.9, 3.1	2.0
068 Liquid Radwaste	x										xx	K1.02, Vent header connection Gen. 2.3.11, Control radiation releases Gen. 2.4.48, Control room indications	2.5, 2.7, 3.5	3.0
071 Waste Gas Disposal			x					x	x			K3.05, Loss of ARM/PRM on WD A2.05, Power failure auto response A3.03, Actuation signals	2.5, 3.2, 3.6	3.0
072 Area Radiation Monitoring					x							K5.02, Intensity changes vs. distance	2.5	1.0
K/A Category Point Totals:	2	1	3	2	2	1	3	2	3	2	2	Group Point Total:		23.0

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2													Form ES-401-4

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant					x							K5.02, Vent flow path during drain (plant event)	2.5	1.0
006 Emergency Core Cooling						x						K6.03, Loss of SI pumps	3.6	1.0
010 Pressurizer Pressure Control		x	x									K2.02, Pwr supply to spray vlv cont K3.03, Loss of press cont on ESFAS (PSA)	2.5, 4.0	2.0
011 Pressurizer Level Control						x						K6.01, Start chg pump while inc LTDN	2.8	1.0
012 Reactor Protection						x						K6.04, Loss of bypass/block ckt	3.3	1.0
014 Rod Position Indication					x							K5.02, Independent of demand signals	2.8	1.0
016 Non-nuclear Instrumentation														
026 Containment Spray								x				A2.04, Failure of spray pump	3.9	1.0
029 Containment Purge				x								K4.02, Pressure in CV	2.9	1.0
033 Spent Fuel Pool Cooling									x			A3.02, SFP leak/rupture	2.9	1.0
035 Steam Generator										x	x	A4.05, Lvl cont to enhance Nat circ Gen. 2.2.23,LCO for S/G	3.8, 2.6	2.0
039 Main and Reheat Steam	x											K1.08, Connection MFW	2.7	1.0
055 Condenser Air Removal								x				A2.02, Vacuum pumps (< 2.5, because of Plant Mod)	2.1	1.0
062 AC Electrical Distribution		x	x									K2.01, Major system load K3.01, Loss of major load effect	3.3, 3.5	2.0
063 DC Electrical Distribution			x									K3.01, Loss of DC to EDG's	3.7	1.0
064 Emergency Diesel Generator							x					A1.03, Opeating voltages, currents & temp	3.2	1.0
073 Process Radiation Monitoring	x											K1.01, Connect to other systems	3.6	1.0
075 Circulating Water														
079 Station Air														
086 Fire Protection									x			A3.02, Actuation of FPS	2.9	1.0
K/A Category Point Totals:	2	2	3	1	2	3	1	2	2	1	1	Group Point Total:		20.0

Plant Systems - Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal	x											K1.06, Connections to SI (PSA)	3.5	1.0
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water		x										K2.02, Pwr supply to CCW including B/U (PSA)	3.0	1.0
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control					x							K5.02, Flammable Hyd concentration	3.4	1.0
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control						x						K6.03, Loss of CRD system on Steam dumps	2.7	1.0
045 Main Turbine Generator					x							K5.18, Purpose of Low power trips	2.7	1.0
076 Service Water									x			A3.02, Emergency Heat Loads	3.7	1.0
078 Instrument Air									x			A3.01, Auto Oper based on Air pressure	3.1	1.0
103 Containment										x		A4.04, Phase A/B resets	3.5*	1.0
K/A Category Point Totals:	1	1			2	1			2	1		Group Point Total:		8.0

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: RO

Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Conduct of Operations requirements	3.7	1.0
	2.1.20	Ability to execute procedure steps, RNO's	4.3	1.0
	2.1.22	Ability to determine Mode of Operation	2.8	1.0
	2.1.25	Obtain/Interpret Graphs and tables	2.8	1.0
				4.0
	Total			
Equipment Control	2.2.1	Pre-startup procedures affecting reactivity	3.7	1.0
	2.2.13	Tagging and clearance procedures change boundaries	3.6	1.0
	2.2.22	LCO and safety limits	3.4	1.0
	Total			3.0
Radiation Control	2.3.1	10CFR20 and facility requirements	2.6	1.0
	2.3.9	Containment purge	2.5	1.0
	2.3.10	Procedure to reduce radiation levels	2.9	1.0
	Total			3.0
Emergency Procedures and Plan	2.4.2	Setpoint, interlocks, Automatic actions for EOP entry (FRP-C.1)	3.9	1.0
	2.4.6	Mitigation strategies (EPP's)	3.1	1.0
	2.4.18	EOP's Basis (FRP-S.1)	2.7	1.0
	Total			3.0
Tier 3 Target Point Total (RO)				13

Facility: H.B. Robinson Date of Exam: 7-23-99 Exam Level: RO/SRO

	Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility				[initials]	TN	
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available				[initials]	TN	
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401				[initials]	TN	
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right	NRC: 0	Other: 0		[initials]	TN	
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]				[initials]	TN	
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank:	Modified:	New: 100	[initials]	TN	
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory: 41	C/A: 59		[initials]	TN	
8.	References/handouts provided do not give away answers				[initials]	TN	
9.	Question distribution meets previously approved examination outline; deviations are justified				[initials]	TN	
10.	Question psychometric quality and format meet ES, Appendix B, guidelines				[initials]	TN	
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet				[initials]	TN	

	Printed Name / Signature	Date
a. Author	Gregory S. Potect / [signature]	6-10-99
b. Facility Reviewer(*)	Thomas J. Natale / [signature]	6-10-99
c. NRC Chief Examiner(*)		
d. NRC Regional Supervisor(*)		

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, 4, 5, and 6.
[ ] The items in brackets do not apply to NRC-prepared examinations.

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: SRO

Tier	Group	K/A Category Points K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Point Total
1. Emergency & Abnormal Plant Evolutions	1	2	2	4					10			6	24
	2	2	1	2				2	6			3	16
	3	1		2									3
	Tier Totals	5	3	8				2	16			9	43
2. Plant Systems	1	1	1	3	1	1	1	3	2	3	2	1	19
	2	2		2	1	1	2		3	2	2	2	17
	3		1						2	1			4
	Tier Totals	3	2	5	2	2	3	3	7	6	4	3	40
3. Generic Knowledge and Abilities		Cat 1		Cat 2		Cat 3		Cat 4					
		4		4		4		5					17

Note:
- Attempt to distribute topics among all K/A categories; select at least one topic from every K/A category within each tier.
- Actual point totals must match those specified in the table.
- Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
- Systems/evolutions within each group are identified on the associated outline.
- The shaded areas are not applicable to the category/tier.

Submitted By: Gregory S Croft / Gregory S Croft Facility Reviewer: Thomas Natale / Thomas Natale

Chief Examiner: ______________________

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / I					o		AA2.03, Auto Safety Functions Fail	4.8	1.0
000003 Dropped Control Rod / I					o		AA2.02, Input to system	2.8	1.0
000005 Inoperable/Stuck Control Rod / I			x				AK3.05, Power limits/misaligned	3.4	1.0
000011 Large Break LOCA / III					o		EA2.14, Actions PTS violated (PSA)	4.0	1.0
W/E04 LOCA Outside Containment / III									
W/E02 SI Termination / III					o		EA2.2, Adherence to procedures w/in limits	4.0	1.0
000015/17 RCP Malfunctions / IV						o	Gen. 2.1.7, Operator judgment based on RCP's	4.4	1.0
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV		x	x				EK 2.1 (E09), Nat. Circ. (controls, interlocks, auto/manual) EK 3.1 (E10), Reason for response (temp. press, reactivity)	3.2 3.3	2.0
000024 Emergency Boration / I					o		AA2.05, Boron to add for SDM	3.9	1.0
000026 Loss of Component Cooling Water / VIII									
000029 Anticipated Transient w/o Scram / I						o	Gen. 2.4.5 (CSFST question)	3.6	1.0
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	x		x			x	EK1.2, Knowledge of AOP/EOP EK3.1, Temp/press. changes and effects Gen. 2.1.21, Ability to verify a controlled procedure copy	3.5 3.5 3.2	3.0
CE/A11; W/E08 RCS Overcooling - PTS / IV					o		EA2.1, Procedure selection	4.2	1.0
000051 Loss of Condenser Vacuum / IV									
000055 Station Blackout / VI	x		x			o	Gen. 2.4.21 (Loss of Power Monitoring) (PSA), EK3.01, Battery capacity, EK1.01, discharge rates	4.3, 3.4, 3.3	3.0
000057 Loss of Vital AC Elec. Inst. Bus / VI					x		AA2.03, RPS alarms and annunciators	3.7	1.0
000059 Accidental Liquid RadWaste Rel. / IX									
000062 Loss of Nuclear Service Water / IV					o		AA2.04, Temp. limits for components (PSA)	2.9	1.0
000067 Plant Fire On-site / IX						o	Gen. 2.3.10, Radiation exposure during fire	3.3	1.0
000068 (BW/A06) Control Room Evac. / VIII									
000069 (W/E14) Loss of CTMT Integrity / V		x			x		AK2.03, Personnel hatch OST (Plant event) AA2.01, Determine loss of integrity	2.8, 3.7	2.0
000074 (W/E06&E07) Inad. Core Cooling / IV					o		EA2.1 (W/E 06), Procedures to use	4.2	1.0
BW/E03 Inadequate Subcooling Margin / IV									
000076 High Reactor Coolant Activity / IX						o	Gen. 2.3.4, Exceeding authorized radiation levels	3.1	1.0
BW/A02&A03 Loss of NNI-X/Y / VII									
K/A Category Totals:	2	2	4		10	6	Group Point Total:		24.0

o is SRO ONLY, x is for both RO/SRO

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / I					o		EA2.02, Leak Paths	4.6	1.0
BW/A01 Plant Runback / I									
BW/A04 Turbine Trip / IV									
000008 Pressurizer Vapor Space Accident / III					o		AA2.06, PORV Logic LTOP	3.6	1.0
000009 Small Break LOCA / III				x			EA1.06, Use computer during LOCA	3.0	1.0
BW/E08; W/E03 LOCA Cooldown - Depress. / IV									
W/E11 Loss of Emergency Coolant Recirc. / IV		x					EK 2.1, Heat removal systems	3.6	1.0
000022 Loss of Reactor Coolant Makeup / II	x						AK1.04, Manual to auto flow control	2.9	1.0
000025 Loss of RHR System / IV						o	Gen. 2.4.4, Entry condition (PS)	4.3	1.0
000027 Pressurizer Pressure Control System Malfunction / III					x		AA2.07Makeup flow indication (PSA)	3.1	1.0
000032 Loss of Source Range NI / VII									
000033 Loss of Intermediate Range NI / VII					x		AA2.12, Max. channel disagreement	3.1*	1.0
000037 Steam Generator Tube Leak / III						o	Gen. 2.4.8, EOP/AOP usage together	3.7	1.0
000038 Steam Generator Tube Rupture / III				x			EA1.05, Max. depressurization rate	4.1	1.0
000054 (CE/E06) Loss of Main Feedwater / IV					x		AA2.05, Status of MFW pumps, RV's and stop valves	3.5	1.0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV			x				EK 3.2, Knowledge of EOP/AOP	3.7	1.0
000058 Loss of DC Power / VI						o	Gen. 2.1.32, Apply system limits (TS)	3.8	1.0
000060 Accidental Gaseous Radwaste Rel. / IX			x				AK3.02, Aux Bldg ventilation during release	3.3	1.0
000061 ARM System Alarms / VII	x						AK1.01, Detector limits	2.9	1.0
W/E16 High Containment Radiation / IX									
000065 Loss of Instrument Air / VIII					o		AA2.05, shutdown requirements	4.1	1.0
CE/E09 Functional Recovery									
K/A Category Point Totals:	2	1	2	2	6	3	Group Point Total:		16

o is SRO ONLY, x is for both RO/SRO

ES-.. PWR SRO E... .ation Outline Form... 401-3

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II			x				AK3.05, EOP actions	3.7	1.0
000036 (BW/A08) Fuel Handling Accident / VIII									
000056 Loss of Off-site Power / VI			x				AK3.01, Load sequencer (PSA)	3.5	1.0
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / VI									
BW/A07 Flooding / VIII									
CE/A16 Excess RCS Leakage / II									
W/E13 Steam Generator Over-pressure / IV	x						EK 1.2, EOP/AOP's used	3.0	1.0
W/E15 Containment Flooding / V									
K/A Category Point Totals:	1		2				Group Point Total:		3.0

o is SRO ONLY, x is for both RO/SRO

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			x						x			K3.01, CRDS to CVCS effects A3.04, Radial Imbalance	2.9, 3.8	2.0
003 Reactor Coolant Pump							x					A1.02, Pump/motor bearing temps	2.9	1.0
004 Chemical and Volume Control		x					x					K2.03, Chg pump pwr supplies A1.03, Predict changes in pressure	3.5, 3.8	2.0
013 Engineered Safety Features Actuation			x							x		K3.03, Loss of ESFAS, effect on CV A4.01, Equipment fails to actuate	4.7, 4.8	2.0
014 Rod Position Indication														
015 Nuclear Instrumentation	x				x		x					K1.03, NI to CRDS K5.02, Compensation operation A1.01, Calibration by heat balance	3.1, 2.9, 3.8	3.0
017 In-core Temperature Monitor						x						K6.01, Loss of sensor/detector	2.7	1.0
022 Containment Cooling				x								K4.03, Auto CV isolation interlock	4.0	1.0
025 Ice Condenser														
026 Containment Spray														
056 Condensate														
059 Main Feedwater								x		x		A2.04, Feeding a dry S/G A4.12, Auto FW isolation	2.9, 3.4	2.0
061 Auxiliary/Emergency Feedwater									x			A3.03, AFW S/G level control auto start	3.9	1.0
063 DC Electrical Distribution														
068 Liquid Radwaste											x	Gen. 2.4.48, Control room indications	3.8	1.0
071 Waste Gas Disposal			x					x	x			K3.05, Loss of ARM/PRM on WD A2.05, Power failure auto resp. A3.03, Actuation signals	2.5, 3.2, 3.6	3.0
072 Area Radiation Monitoring														
K/A Category Point Totals:	1	1	3	1	1	1	3	2	3	2	1	Group Point Total:		19.0

o is SRO ONLY, x is for both RO/SRO

PWR SRO Examination Outline
Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant					x			o				A2.02, Impact of loss of pressure K5.02, Vent flow path during drain (event)	4.4, 2.5	2.0
006 Emergency Core Cooling								o				A2.12, ECCS initiation criteria	4.8	1.0
010 Pressurizer Pressure Control			x									K3.03, Loss of press cont on ESFAS (PSA)	4.0	1.0
011 Pressurizer Level Control						x						K6.01, Start chg pump while inc. LTDN	2.8	1.0
012 Reactor Protection						x					o	K6.04, Loss of bypass/block ckt Gen. 2.1.12, TS question	3.1, 4.0	2.0
016 Non-nuclear Instrumentation														
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge				x								K4.02, Pressure in CV	2.9	1.0
033 Spent Fuel Pool Cooling									x			A3.02, SFP leak or rupture	3.1	1.0
034 Fuel Handling Equipment														
035 Steam Generator										x	x	A4.05, Lvl cont to enhance Nat. circ Gen. 2.2.23, LCO for S/G	3.8, 2.6	2.0
039 Main and Reheat Steam	x											K1.08, Connect to MFW	2.7	1.0
055 Condenser Air Removal								x				A2.02 (<2.5, because of plant mod) Vacuum pumps	2.1	1.0
062 AC Electrical Distribution			x									K3.01, Loss of major load/effect	3.9	1.0
064 Emergency Diesel Generator														
073 Process Radiation Monitoring	x											K1.01, Connect to other systems	3.6	1.0
075 Circulating Water														
079 Station Air														
086 Fire Protection									x			A3.02, Actuation of FPS	3.3	1.0
103 Containment										x		A4.04, Phase A/B reset	3.5*	1.0
K/A Category Point Totals:	2		2	1	1	2		3	2	2	2	Group Point Total:		17.0

o is SRO ONLY, x is for both RO/SRO

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal								o				A2.02, Impact of Press transient during CSD (PSA)	3.7	1.0
007 Pressurizer Relief/Quench Tank								o				A2.03, Overpressurize PZR	3.9	1.0
008 Component Cooling Water		x										K2.02, Pwr supply CCW including B/U (PSA)	3.0	1.0
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
076 Service Water									x			A3.02, Emergency heat loads (PSA)	3.7	1.0
078 Instrument Air														
K/A Category Point Totals:		1						2	1			Group Point Total:		4.0

o is SRO ONLY, x is for both RO/SRO

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: SRO				
Category	K/A #	Topic	Imp.	Points
Conduct of	2.1.1	x, Conduct of Operations requirements	3.8	1.0
Operations	2.1.20	x, Ability to execute procedure steps, RNO's	4.2	1.0
	2.1.22	x, Ability to determine Mode of Operation	3.3	1.0
	2.1.25	x, Obtain/Interpret Graphs and tables	3.1	1.0
	Total			4.0
Equipment	2.2.1	x, Pre-startup procedures affecting reactivity	3.6	1.0
Control	2.2.13	x, Tagging and clearance procedures change boundaries	3.8	1.0
	2.2.18	o, Managing activities during shutdown	3.6	1.0
	2.2.22	x, LCO and safety limits	4.1	1.0
	Total			4.0
Radiation	2.3.1	x, 10CFR20 and facility requirements	3.0	1.0
Control	2.3.4	o, exposure limits, contamination control, exceed limits	3.1	1.0
	2.3.9	x, Containment purge	3.4	1.0
	2.3.10	x, Procedure to reduce radiation levels	3.3	1.0
	Total			4.0
Emergency	2.4.2	x, Setpoint, interlocks, Automatic actions for EOP entry (FRP-C.1)	4.1	1.0
Procedures	2.4.5	o, Procedure organization layout/organization	3.6	1.0
and Plan	2.4.6	x, Mitigation strategies (EPP's)	4.0	1.0
	2.4.18	x, EOP's Basis (FRP-S.1)	3.6	1.0
	2.4.38	o, Emergency Plan as SEC	4.0	1.0
				5.0
	Total			
Tier 3 Target Point Total (SRO)				17

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	2	2	4					10			6	24
	2	2	1	2				2	6			3	16
	3	1		2									3
	Tier Totals	5	3	8				2	16			9	43
2. Plant Systems	1	1	1	3	1	1	1	3	2	3	2	1	19
	2	2		2	1	1	2		3	2	2	2	17
	3		1						2	1			4
	Tier Totals	3	2	5	2	2	3	3	7	6	4	3	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	
	4	4	4	5	17

Note:
- Attempt to distribute topics among all K/A categories; select at least one topic from every K/A category within each tier.
- Actual point totals must match those specified in the table.
- Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
- Systems/evolutions within each group are identified on the associated outline.
- The shaded areas are not applicable to the category/tier.

Submitted By: ______________________ Facility Reviewer: ______________________

Chief Examiner: ______________________

ES-401 | PWR SRO Examination Outline | Form ES-401-3

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / I					o		AA2.03, Auto Safety Functions Fail	4.8	1.0
000003 Dropped Control Rod / I					o		AA2.02, Input to system	2.8	1.0
000005 Inoperable/Stuck Control Rod / I			x				AK3.05, Power limits/misaligned	3.4	1.0
000011 Large Break LOCA / III					o		EA2.14, Actions PTS violated (PSA)	4.0	1.0
W/E04 LOCA Outside Containment / III									
W/E02 SI Termination / III					o		EA2.2, Adherence to procedures w/in limits	4.0	1.0
000015/17 RCP Malfunctions / IV						o	Gen. 2.1.7, Operator judgment based on RCP's	4.4	1.0
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV		x	x				EK 2.1 (E09), Nat. Circ. (controls, interlocks, auto/manual) EK 3.1 (E10), Reason for response (temp. press, reactivity)	3.2 3.3	2.0
000024 Emergency Boration / I					o		AA2.05, Boron to add for SDM	3.9	1.0
000026 Loss of Component Cooling Water / VIII									
000029 Anticipated Transient w/o Scram / I						o	Gen. 2.4.5 (CSFST question)	3.6	1.0
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	x		x			x	EK1.2, Knowledge of AOP/EOP EK3.1, Temp/press. changes and effects Gen. 2.1.21, Ability to verify a controlled procedure copy	3.5 3.5 3.2	3.0
CE/A11; W/E08 RCS Overcooling - PTS / IV					o		EA2.1, Procedure selection	4.2	1.0
000051 Loss of Condenser Vacuum / IV									
000055 Station Blackout / VI	x		x			o	Gen. 2.4.21 (Loss of Power Monitoring) (PSA), EK3.01, Battery capacity, EK1.01, discharge rates	4.3, 3.4, 3.3	3.0
000057 Loss of Vital AC Elec. Inst. Bus / VI					x		AA2.03, RPS alarms and annunciators	3.7	1.0
000059 Accidental Liquid RadWaste Rel. / IX									
000062 Loss of Nuclear Service Water / IV					o		AA2.04, Temp. limits for components (PSA)	2.9	1.0
000067 Plant Fire On-site / IX						o	Gen. 2.3.10, Radiation exposure during fire	3.3	1.0
000068 (BW/A06) Control Room Evac. / VIII									
000069 (W/E14) Loss of CTMT Integrity / V		x			x		AK2.03, Personnel hatch OST (Plant event) AA2.01, Determine loss of integrity	2.8, 3.7	2.0
000074 (W/E06&E07) Inad. Core Cooling / IV					o		EA2.1 (W/E 06), Procedures to use	4.2	1.0
BW/E03 Inadequate Subcooling Margin / IV									
000076 High Reactor Coolant Activity / IX						o	Gen. 2.3.4, Exceeding authorized radiation levels	3.1	1.0
BW/A02&A03 Loss of NNI-X/Y / VII									
K/A Category Totals:	2	2	4		10	6	Group Point Total:		24.0

o is SRO ONLY, x is for both RO/SRO

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PWR SRO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Form ES-401-3

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / I					o		EA2.02, Leak Paths	4.6	1.0
BW/A01 Plant Runback / I									
BW/A04 Turbine Trip / IV									
000008 Pressurizer Vapor Space Accident / III					o		AA2.06, PORV Logic LTOP	3.6	1.0
000009 Small Break LOCA / III				x			EA1.06, Use computer during LOCA	3.0	1.0
BW/E08; W/E03 LOCA Cooldown - Depress. / IV									
W/E11 Loss of Emergency Coolant Recirc. / IV		x					EK 2.1, Heat removal systems	3.6	1.0
000022 Loss of Reactor Coolant Makeup / II	x						AK1.04, Manual to auto flow control	2.9	1.0
000025 Loss of RHR System / IV						o	Gen. 2.4.4, Entry condition (PS)	4.3	1.0
000027 Pressurizer Pressure Control System Malfunction / III					x		AA2.07Makeup flow indication (PSA)	3.1	1.0
000032 Loss of Source Range NI / VII									
000033 Loss of Intermediate Range NI / VII					x		AA2.12, Max. channel disagreement	3.1*	1.0
000037 Steam Generator Tube Leak / III						o	Gen. 2.4.8, EOP/AOP usage together	3.7	1.0
000038 Steam Generator Tube Rupture / III				x			EA1.05, Max. depressurization rate	4.1	1.0
000054 (CE/E06) Loss of Main Feedwater / IV					x		AA2.05, Status of MFW pumps, RV's and stop valves	3.5	1.0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV			x				EK 3.2, Knowledge of EOP/AOP	3.7	1.0
000058 Loss of DC Power / VI						o	Gen. 2.1.32, Apply system limits (TS)	3.8	1.0
000060 Accidental Gaseous Radwaste Rel. / IX			x				AK3.02, Aux Bldg ventilation during release	3.3	1.0
000061 ARM System Alarms / VII	x						AK1.01, Detector limits	2.9	1.0
W/E16 High Containment Radiation / IX									
000065 Loss of Instrument Air / VIII					o		AA2.05, shutdown requirements	4.1	1.0
CE/E09 Functional Recovery									
K/A Category Point Totals:	2	1	2	2	6	3	Group Point Total:		16

o is SRO ONLY, x is for both RO/SRO

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3	Form ES-401-3

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II			x				AK3.05, EOP actions	3.7	1.0
000036 (BW/A08) Fuel Handling Accident / VIII									
000056 Loss of Off-site Power / VI			x				AK3.01, Load sequencer (PSA)	3.5	1.0
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / VI									
BW/A07 Flooding / VIII									
CE/A16 Excess RCS Leakage / II									
W/E13 Steam Generator Over-pressure / IV	x						EK 1.2, EOP/AOP's used	3.0	1.0
W/E15 Containment Flooding / V									
K/A Category Point Totals:	1		2				Group Point Total:		3.0

o is SRO ONLY, x is for both RO/SRO

Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			x						x			K3.01, CRDS to CVCS effects A3.04, Radial Imbalance	2.9, 3.8	2.0
003 Reactor Coolant Pump							x					A1.02, Pump/motor bearing temps	2.9	1.0
004 Chemical and Volume Control		x					x					K2.03, Chg pump pwr supplies A1.03, Predict changes in pressure	3.5, 3.8	2.0
013 Engineered Safety Features Actuation			x							x		K3.03, Loss of ESFAS, effect on CV A4.01, Equipment fails to actuate	4.7, 4.8	2.0
014 Rod Position Indication														
015 Nuclear Instrumentation	x				x		x					K1.03, NI to CRDS K5.02, Compensation operation A1.01, Calibration by heat balance	3.1, 2.9, 3.8	3.0
017 In-core Temperature Monitor						x						K6.01, Loss of sensor/detector	2.7	1.0
022 Containment Cooling				x								K4.03, Auto CV Isolation Interlock	4.0	1.0
025 Ice Condenser														
026 Containment Spray														
056 Condensate														
059 Main Feedwater								x		x		A2.04, Feeding a dry S/G A4.12, Auto FW Isolation	2.9, 3.4	2.0
061 Auxiliary/Emergency Feedwater									x			A3.03, AFW S/G level control auto start	3.9	1.0
063 DC Electrical Distribution														
068 Liquid Radwaste											x	Gen. 2.4.48, Control room indications	3.8	1.0
071 Waste Gas Disposal			x					x	x			K3.05, Loss of ARM/PRM on WD A2.05, Power failure auto resp. A3.03, Actuation signals	2.5, 3.2, 3.6	3.0
072 Area Radiation Monitoring														
K/A Category Point Totals:	1	1	3	1	1	1	3	2	3	2	1	Group Point Total:		19.0

o is SRO ONLY, x is for both RO/SRO

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PWR SRO Examination Outline
Plant Systems - Tier 2/Group 2

Form ES-401-3

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant					x			o				A2.02, Impact of loss of pressure K5.02, Vent flow path during drain (event)	4.4, 2.5	2.0
006 Emergency Core Cooling								o				A2.12, ECCS initiation criteria	4.8	1.0
010 Pressurizer Pressure Control			x									K3.03, Loss of press cont on ESFAS (PSA)	4.0	1.0
011 Pressurizer Level Control						x						K6.01, Start chg pump while inc. LTDN	2.8	1.0
012 Reactor Protection						x					o	K6.04, Loss of bypass/block ckt Gen. 2.1.12, TS question	3.1, 4.0	2.0
016 Non-nuclear Instrumentation														
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge				x								K4.02, Pressure in CV	2.9	1.0
033 Spent Fuel Pool Cooling									x			A3.02, SFP leak or rupture	3.1	1.0
034 Fuel Handling Equipment														
035 Steam Generator										x	x	A4.05, Lvl cont to enhance Nat. circ Gen. 2.2.23, LCO for S/G	3.8, 2.6	2.0
039 Main and Reheat Steam	x											K1.08, Connect to MFW	2.7	1.0
055 Condenser Air Removal								x				A2.02 (<2.5, because of plant mod) Vacuum pumps	2.1	1.0
062 AC Electrical Distribution			x									K3.01, Loss of major load/effect	3.9	1.0
064 Emergency Diesel Generator														
073 Process Radiation Monitoring	x											K1.01, Connect to other systems	3.6	1.0
075 Circulating Water														
079 Station Air														
086 Fire Protection									x			A3.02, Actuation of FPS	3.3	1.0
103 Containment										x		A4.04, Phase A/B reset	3.5*	1.0
K/A Category Point Totals:	2		2	1	1	2		3	2	2	2	Group Point Total:		17.0

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PWR SRO Examination Outline
Plant Systems - Tier 2/Group 3

Form ES-401-3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal								o				A2.02, Impact of Press transient during CSD (PSA)	3.7	1.0
007 Pressurizer Relief/Quench Tank								o				A2.03, Overpressurize PZR	3.9	1.0
008 Component Cooling Water		x										K2.02, Pwr supply CCW including B/U (PSA)	3.2*	1.0
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
076 Service Water									x			A3.02, Emergency heat loads (PSA)	3.7	1.0
078 Instrument Air														
K/A Category Point Totals:		1						2	1			Group Point Total:		4.0

o is SRO ONLY, x is for both RO/SRO

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: SRO

Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	x, Conduct of Operations requirements	3.8	1.0
	2.1.20	x, Ability to execute procedure steps, RNO's	4.2	1.0
	2.1.22	x, Ability to determine Mode of Operation	3.3	1.0
	2.1.25	x, Obtain/Interpret Graphs and tables	3.1	1.0
	Total			4.0
Equipment Control	2.2.1	x, Pre-startup procedures affecting reactivity	3.6	1.0
	2.2.13	x, Tagging and clearance procedures change boundaries	3.8	1.0
	2.2.18	o, Managing activities during shutdown	3.6	1.0
	2.2.22	x, LCO and safety limits	4.1	1.0
	Total			4.0
Radiation Control	2.3.1	x, 10CFR20 and facility requirements	3.0	1.0
	2.3.4	o, exposure limits, contamination control, exceed limits	3.1	1.0
	2.3.9	x, Containment purge	3.4	1.0
	2.3.10	x, Procedure to reduce radiation levels	3.3	1.0
	Total			4.0
Emergency Procedures and Plan	2.4.2	x, Setpoint, interlocks, Automatic actions for EOP entry (FRP-C.1)	4.1	1.0
	2.4.5	o, Procedure organization layout/organization	3.6	1.0
	2.4.6	x, Mitigation strategies (EPP's)	4.0	1.0
	2.4.18	x, EOP's Basis (FRP-S.1)	3.6	1.0
	2.4.38	o, Emergency Plan as SEC	4.0	1.0
				5.0
	Total			
Tier 3 Target Point Total (SRO)				17

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: RO

Tier	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Point Total
		K/A Category Points											
1. Emergency & Abnormal Plant Evolutions	1	3	2	4				1	4			2	16
	2	4	2	4				2	3			2	17
	3	1		2									3
	Tier Totals	8	4	10				3	7			4	36
2. Plant Systems	1	2	1	3	2	2	1	3	2	3	2	2	23
	2	2	2	3	1	2	3	1	2	2	1	1	20
	3	1	1			2	1			2	1		8
	Tier Totals	5	4	6	3	6	5	4	4	7	4	3	51

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	
	4	3	3	3	13

Note:
- Attempt to distribute topics among all K/A categories; select at least one topic from every K/A category within each tier.
- Actual point totals must match those specified in the table.
- Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
- Systems/evolutions within each group are identified on the associated outline.
- The shaded areas are not applicable to the category/tier.

Submitted By: ____________________ Facility Reviewer: ____________________

Chief Examiner: ____________________

ES-401 PWR RO Examination Outline Form ES-401-4

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / I			x				AK3.05, Pwr limit misaligned	3.4	1.0
000015/17 RCP Malfunctions / IV						x	Gen.2.1.7, Oper. Judgment based on RCP's	3.7	1.0
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV		x	x				EK2.1 (E09), Nat. circ (control, interlocks, auto/man) EK3.1 (E10), Reason for response (temp, press, reactivity)	3.2 3.3	2.0
000024 Emergency Boration / I									
000026 Loss of Component Cooling Water / VIII									
000027 Pressurizer Pressure Control System Malfunction / III					x		AA2.07, Makeup flow indication (PSA)	3.1	1.0
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	x		x			x	EK1.2, Know. Of AOP/EOP EK3.1, Temp/pressure changes/effects Gen. 2.1.21, Ability to verify a controlled procedure copy	3.5 3.5 3.1	3.0
CE/A11; W/E08 RCS Overcooling - PTS / IV									
000051 Loss of Condenser Vacuum / IV									
000055 Station Blackout / VI	x		x				EK3.01, battery capacity EK1.01, discharge rates	3.3 2.7	2.0
000057 Loss of Vital AC Elec. Inst. Bus / VI				x	x		AA1.03, FW control to control S/G level and press AA2.03, RPS alarms and annunciators	3.6, 3.7	2.0
000062 Loss of Nuclear Service Water / IV									
000067 Plant Fire On-site / IX									
000068 (BW/A06) Control Room Evac. / VIII	x						AK1.01, Use of steam tables (Previous Exam Weakness)	2.4	1.0
000069 (W/E14) Loss of CTMT Integrity / V		x			x		AK2.03, Personnel hatch OST (plant event) AA2.01, Determine loss of integrity	2.8 3.7	2.0
000074 (W/E06&E07) Inad. Core Cooling / IV									
BW/E03 Inadequate Subcooling Margin / IV									
000076 High Reactor Coolant Activity / IX					x		AA2.02, Actions for high activity	2.7	1.0
BW/A02&A03 Loss of NNI-X/Y / VII									
K/A Category Totals:	3	2	4	1	4	2	Group Point Total:		16.0

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / I	x					x	AK1.08, Control rod motion Gen 2.4.12, Crew responsibility during emergency	2.9 3.4	2.0
000003 Dropped Control Rod / I									
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / I									
BW/A01 Plant Runback / I									
BW/A04 Turbine Trip / IV									
000008 Pressurizer Vapor Space Accident / III									
000009 Small Break LOCA / III				x			EA1.06, Use computer during a LOCA	3.0	1.0
000011 Large Break LOCA / III					x		EA2.03, LOCA with loss of CCW (PSA)	3.7	1.0
W/E04 LOCA Outside Containment / III			x				EK3.2, EOP/AOP used with LOCA outside CV	3.4	1.0
BW/E08; W/E03 LOCA Cooldown/Depress. / IV									
W/E11 Loss of Emergency Coolant Recirc. / IV		x					EK2.1, Heat removal systems	3.6	1.0
W/E02 SI Termination / III			x				EK3.4, RO functions with Control room team	3.5	1.0
000022 Loss of Reactor Coolant Makeup / II	x						AK1.04, Manual to auto flow control	2.9	1.0
000025 Loss of RHR System / IV									
000029 Anticipated Transient w/o Scram / I						x	Gen 2.4.1, EOP entry conditions (PSA)	4.3	1.0
000032 Loss of Source Range NI / VII	x						AK1.01, Voltage change effect on performance	2.5	1.0
000033 Loss of Intermediate Range NI / VII					x		AA2.12, Maximum channel disagrement	2.5	1.0
000037 Steam Generator Tube Leak / III									
000038 Steam Generator Tube Rupture / III				x			EA1.05, max depressurization rate	4.1	1.0
000054 (CE/E06) Loss of Main Feedwater / IV					x		AA2.05, Status of MFW pumps, RV'sand stop vlvs	3.5	1.0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV			x				EK3.2, EOP/AOP's	3.7	1.0
000058 Loss of DC Power / VI									
000059 Accidental Liquid RadWaste Rel. / IX		x					AK2.02, Radioactive Gas Monitors	2.7	1.0
000060 Accidental Gaseous Radwaste Rel. / IX			x				AK3.02, Aux. Bldg Ventilation during release	3.3	1.0
000061 ARM System Alarms / VII	x						AK1.01, Detector limits	2.5	1.0
W/E16 High Containment Radiation / IX									
CE/E09 Functional Recovery									
K/A Category Point Totals:	4	2	4	2	3	2	Group Point Total:		17.0

ES-401

PWR RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II			x				AK3.05, EOP Actions	3.7	1.0
000036 (BW/A08) Fuel Handling Accident / VIII									
000056 Loss of Off-site Power / VI			x				AK3.01, Load Sequencer (PSA)	3.5	1.0
000065 Loss of Instrument Air / VIII									
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / VI									
BW/A07 Flooding / VIII									
CE/A16 Excess RCS Leakage / II									
W/E13 Steam Generator Over-pressure / IV	x						EK1.2, AOP's/EOP's used	3.0	1.0
W/E15 Containment Flooding / V									
K/A Category Point Totals:	1		2				Group Point Total:		3.0

PWR RO Examination Outline
Plant Systems - Tier 2/Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			x						x			K3.01, CRDS to CVCS A3.04, Radial Imbalance	2.9, 3.5	2.0
003 Reactor Coolant Pump							x					A1.02, Pump/Motor bearing temps	2.9	1.0
004 Chemical and Volume Control		x					x					K2.03, Chg pump pwr supplies A1.03, Predict changes in pressure	3.3, 3.8	2.0
013 Engineered Safety Features Actuation			x							x		K3.03, Loss of ESFAS effect on CV A4.01, Equipment fails to actuate	4.3, 4.5	2.0
015 Nuclear Instrumentation	x				x		x					K1.03, NI to CRDS connection K5.02, Compensation operations A1.01, Calibration by heat balance	3.1*, 2.7, 3.5	3.0
017 In-core Temperature Monitor						x						K6.01, Loss of sensor/detector	2.7	1.0
022 Containment Cooling				x								K4.03, Auto CV isolation interlock	3.6	1.0
025 Ice Condenser														
056 Condensate														
059 Main Feedwater								x		x		A2.04, Feeding a dry S/G A4.12, Auto FW Isolation	2.9, 3.4	2.0
061 Auxiliary/Emergency Feedwater				x					x			A3.03, AFW S/G lvl cont auto start (PSA) K4.04, prevent AFW pump runout (PSA)	3.9, 3.1	2.0
068 Liquid Radwaste	x										xx	K1.02, Vent header connection Gen. 2.3.11, Control radiation releases Gen. 2.4.48, Control room indications	2.5, 2.7, 3.8	3.0
071 Waste Gas Disposal			x					x	x			K3.05, Loss of ARM/PRM on WD A2.05, Power failure auto response A3.03, Actuation signals	2.5, 3.2, 3.6	3.0
072 Area Radiation Monitoring					x							K5.02, Intensity changes vs. distance	2.5	1.0
K/A Category Point Totals:	2	1	3	2	2	1	3	2	3	2	2	Group Point Total:		23.0

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant					x							K5.02, Vent flow path during drain (plant event)	2.5	1.0
006 Emergency Core Cooling						x						K6.03, Loss of SI pumps	3.6	1.0
010 Pressurizer Pressure Control		x	x									K2.02, Pwr supply to spray vlv cont K3.03, Loss of press cont on ESFAS (PSA)	2.5, 4.0	2.0
011 Pressurizer Level Control						x						K6.01, Start chg pump while inc LTDN	2.8	1.0
012 Reactor Protection						x						K6.04, Loss of bypass/block ckt	3.3	1.0
014 Rod Position Indication					x							K5.02, Independent of demand signals	2.8	1.0
016 Non-nuclear Instrumentation														
026 Containment Spray								x				A2.04, Failure of spray pump	3.9	1.0
029 Containment Purge				x								K4.02, Pressure in CV	2.9	1.0
033 Spent Fuel Pool Cooling									x			A3.02, SFP leak/rupture	2.9	1.0
035 Steam Generator										x	x	A4.05, Lvl cont to enhance Nat circ Gen. 2.2.23,LCO for S/G	3.8, 2.6	2.0
039 Main and Reheat Steam	x											K1.08, Connection MFW	2.7	1.0
055 Condenser Air Removal								x				A2.02, Vacuum pumps (< 2.5, because of Plant Mod)	2.1	1.0
062 AC Electrical Distribution		x	x									K2.01, Major system load K3.01, Loss of major load effect	3.3, 3.5	2.0
063 DC Electrical Distribution			x									K3.01, Loss of DC to EDG's	3.7	1.0
064 Emergency Diesel Generator							x					A1.03, Opeating voltages, currents & temp	3.2	1.0
073 Process Radiation Monitoring	x											K1.01, Connect to other systems	3.6	1.0
075 Circulating Water														
079 Station Air														
086 Fire Protection									x			A3.02, Actuation of FPS	2.9	1.0
K/A Category Point Totals:	2	2	3	1	2	3	1	2	2	1	1	Group Point Total:		20.0

ES-401

PWR RO Examination Outline
Plant Systems - Tier 2/Group 3

Form ES-401-4

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A1	A2	A3	A 4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal	x											K1.06, Connections to SI (PSA)	3.5	1.0
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water		x										K2.02, Pwr supply to CCW including B/U (PSA)	3.0	1.0
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control					x							K5.02, Flammable Hyd concentration	3.4	1.0
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control						x						K6.03, Loss of CRD system on Steam dumps	2.7	1.0
045 Main Turbine Generator					x							K5.18, Purpose of Low power trips	2.7	1.0
076 Service Water									x			A3.02, Emergency Heat Loads	3.7	1.0
078 Instrument Air									x			A3.01, Auto Oper based on Air pressure	3.1	1.0
103 Containment										x		A4.04, Phase A/B resets	3.5*	1.0
K/A Category Point Totals:	1	1			2	1			2	1		Group Point Total:		8.0

Facility: H. B. Robinson Unit 2 Date of Exam: July 23, 1999 Exam Level: RO

Category	K/A #	Topic	Imp.	Points
Conduct of	2.1.1	Conduct of Operations requirements	3.7	1.0
Operations	2.1.20	Ability to execute procedure steps, RNO's	4.3	1.0
	2.1.22	Ability to determine Mode of Operation	2.8	1.0
	2.1.25	Obtain/Interpret Graphs and tables	2.8	1.0
				4.0
	Total			
Equipment	2.2.1	Pre-startup procedures affecting reactivity	3.7	1.0
Control	2.2.13	Tagging and clearance procedures change boundaries	3.6	1.0
	2.2.22	LCO and safety limits	3.4	1.0
	Total			3.0
Radiation	2.3.1	10CFR20 and facility requirements	2.6	1.0
Control	2.3.9	Containment purge	2.5	1.0
	2.3.10	Procedure to reduce radiation levels	2.9	1.0
	Total			3.0
Emergency	2.4.2	Setpoint, interlocks, Automatic actions for EOP entry (FRP-C.1)	3.9	1.0
Procedures	2.4.6	Mitigation strategies (EPP's)	3.1	1.0
and Plan	2.4.18	EOP's Basis (FRP-S.1)	2.7	1.0
	Total			3.0
Tier 3 Target Point Total (RO)				13

QUALITY TRAINING SUPPORTING WORLD CLASS PERFORMANCE

H.B. ROBINSON NUCLEAR TRAINING

1999 NRC RO EXAMINATION

SUBMITTED BY:	DATE	PRINT YOUR NAME	DATE
APPROVED BY:	DATE	GRADE	DATE
		GRADED BY	DATE

I have neither received nor given any help during this exam

SIGNATURE

I have reviewed the graded examination and have had the opportunity to ask questions about any missed questions

SIGNATURE / DATE

1. Given the following plant conditions:

- Control Rod H-8 from Control Bank "D" (CBD) has dropped into the core
- A runback has occurred and the operators have stabilized the plant at 67% RTP
- CBD @188 steps
- The operators are preparing to recover rod H-8

Which ONE (1) of the following describes the operability of Control Rod H-8 at this time?

The rod is considered:

A. operable because it can be moved by it's mechanism.

B. operable because it is providing the assumed reactivity that would be available upon a reactor trip.

C. inoperable because it is not trippable.

D. inoperable because it is more than 7.5 inches out of alignment with it's bank.

2. Given the following plant conditions:

- The plant is in Hot Shutdown at 547°F with all reactor coolant pumps (RCP's) running, the following sequence of events occur
- Time Occurrence
  * 11:00 "B" RCP trips due to overcurrent relay failure
  * 12:00 "B" RCP started after maintenance and immediately trips
  * 12:35 "B" RCP started after maintenance and immediately trips
  * 13:50 "B" RCP successfully started

Which ONE (1) of the following correctly describes how these events effect the RCP starting requirements?

A. No RCP starting limits have been exceeded.

B. The "B" RCP had not been shutdown long enough when the startup at 12:35 was performed.

C. The pump startup at 13:50 exceeded the limit for maximum number of RCP starts within a two hour period.

D. The pump startup at 13:50 exceeded the limit for maximum number of RCP starts within a 24 hour period.

3. Given the following plant conditions:

- Crew has transitioned from EPP-004, REACTOR TRIP RESPONSE to EPP-005, NATURAL CIRCULATION COOLDOWN
- Operator has energized 150kw of PZR heaters

Which ONE (1) of the following describes the reason for energizing PZR heaters?

A. Minimize head voiding during the cooldown.

B. Minimize the potential of inadvertent dilution when borating.

C. Increase subcooling so cooldown rate can be increased to 25°F per hour.

D. Increase subcooling so cooldown rate can be increased to 100°F per hour.

4. Given the following plant conditions:

- Crew is performing EPP-006, NATURAL CIRCULATION COOLDOWN WITH A VOID IN THE VESSEL
- Operator been directed to control PZR level >20% and < 90%

Which ONE (1) of the following correctly describes the response of the RCS if letdown is greater than charging?

PZR pressure will:

A. decrease. This will cause PZR level to decrease due to the change in void size.

B. decrease. This will cause PZR level to increase due to the change in void size.

C. increase. This will cause PZR level to increase due to the change in void size.

D. increase. This will cause PZR level to decrease due to the change in void size.

5. Given the following plant conditions:

- Mode 1 at 100% RTP
- A malfunction occurs in the Pressurizer Pressure controller
- RCS pressure increases to 2300 psig

Which ONE (1) of the following describes an effect on the plant as a result of the controller malfunction?

A. VCT level decreases.

B. Seal return flow increases.

C. Seal injection flow decreases.

D. Charging flow on FI-122 decreases.

6. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS Subcooling is +165°F
- RCS Pressure is 1720 psig and decreasing
- S/G "A" level is 4% (NR), pressure is 300 psig
- S/G "B" level is 8% (NR), pressure is 320 psig
- S/G "C" level is 0% (NR), 45% (WR), pressure is 150 psig
- CV pressure is 16 psig
- All automatic features have actuated properly

Which ONE (1) of the following contains a correct diagnosis **and** action based on the above indications?

A. Feed header rupture outside of containment, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

B. Only "C" S/G faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

C. All S/G's faulted, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

D. All S/G's faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

7. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS pressure is 1950 psig
- Pressurizer level is 23%
- RCS temperature is 486°F
- RV1-1, Steam Line PORV for S/G "A" is partially OPEN and cannot be shut
- S/G "A" level is 25% WR, pressure is 400 psig and both are decreasing
- S/G "B" and "C" levels are 22% NR and stable

Which ONE (1) of the following contains the expected pressure in S/G's "B" and "C" based on the above indications?

A. 400 psig

B. 585 psig

C. 600 psig

D. 615 psig

8. Given the following plant conditions:

- The Unit is shutdown following a reactor trip
- The path directs you to EPP-11, FAULTED STEAM GENERATOR ISOLATION
- You discover that your copy of EPP-11 is missing
- Upon investigation, all of the copies of EPP-11 in the Control Room are all missing

Which ONE (1) of the following describes the correct process for obtaining the current revision of EPP-11?

A. Refer to the "Ref Only" file in the POM directory on the LAN.

B. Refer to the the revision status on NRCS.

C. Reference the copy in the simulator for the correct revision number.

D. Contact document services to verify the current revision.

9. Given the following plant condition:

- Station Battery "A" has a capacity of 1070 amp-hours
- Station Battery "B" has a capacity of 340 amp-hours
- Each is sized to be able to carry expected shutdown loads during a design basis accident for a specified period of time without a battery charrger

Which ONE (1) of the following states the specified period of time for discharge **and** which battery has the higher discharge rate.

A. Both one hour; A has the highest discharge rate.

B. Both one hour, B has the highest discharge rate.

C. B one hour, A three hours, A has the highest discharge rate.

D. A one hour, B three hours, B has the highest discharge rate.

10. Given the following plant conditions:

- The plant has experienced a trip from 100% RTP

Upon initiation of AFW, which ONE (1) of the following correctly describes the automatic response of the AFW system to these conditions?

The normally:

A. closed MDAFW pump discharge flow control valves (FCV 1424 and 1425) fully open.

B. open SDAFW pump discharge flow control valve (FCV 6416) throttles closed.

C. closed SDAFW pump discharge flow control valve (FCV 6416) throttles open.

D. open MDAFW pump discharge flow control valves (FCV 1424 and 1425) throttle closed.

11. Given the following plant conditions:

- Mode 1 at 100% RTP
- Instrument Bus 2 is being supplied by its alternate power supply
- Power is lost to Instrument Bus 4

Which ONE (1) of the following describes the required crew response?

A. Place Instrument Bus 4 on MCC-8.

B. Trip the reactor and enter Path-1.

C. Verify turbine runback stops when < 70% RTP.

D. Take manual control of all Feed Regulating Valves.

12. Given the following plant conditions:

- Mode 1 at 100% RTP
- A turbine runback occurs
- All windows on Bistable Status Panel "A" are extinguished

Which ONE (1) of the following would provide the above indications if all systems functioned as designed?

A. Loss of "B" battery

B. Loss of "A" battery

C. Loss of Instrument Bus 3

D. Loss of Instrument Bus 1

13. Given the following plant conditions:

- Crew is performing AOP-004, CONTROL ROOM INACCESSABILITY
- Operator is controlling S/G pressure locally between 785 and 935 psig

Which ONE (1) of the following best describes the correct RCS temperature band?

A. 516°F - 537°F

B. 514°F - 535°F

C. 518°F - 538°F

D. 516°F - 538°F

14. Given the following plant conditions:

- Mode 5 due to a forced outage
- CV Integrity is being maintained at the direction of Station management
- Plant heat-up and Mode 4 entry is scheduled for 12 hours from now
- Several CV entries have been made

Which ONE (1) of the following describes the surveillance requirements that must be satisfied for CV Integrity?

OST-014, LLRT (Local Leak Rate Test) OF PERSONNEL AIR LOCK DOOR SEALS, shall be performed:

A. within 3 days of the initial entrance to the CV.

B. within 3 days of the final entrance to the CV.

C. prior to RCS temperature exceeding 200°F.

D. upon RCS temperature reaching 200°F.

15. Given the following plant conditions:

- RCS temperature is 225°F with a plant heatup in progress
- At 1200, while exiting Containment (CV), a group of personnel were unable to close the inner air lock door
- At 1215, the air lock interlock was defeated and the outer door opened and then closed
- At 1245, while entering the airlock to repair the inner door, the outer door malfunctioned and would not seal properly
- It is now 1250

Which ONE (1) of the following describes the correct action to be taken IAW ITS 3.6.2? (ATTACHED)

A. Close door by 1300 today and lock by 1300 tomorrow.

B. Close a door by 1315 today and lock by 1315 tomorrow.

C. Commence evaluation of overall CV leakage per LCO 3.6.1.

D. Commence plant cooldown to 200 degrees.

16. Given the following plant conditions:

- Crew is reducing power to 70% from 100% in response to an MSR intercept valve problem in accordance with OP-105, MANEUVERING THE PLANT WHEN GREATER THAN 25% POWER
- Crew started a second charging pump and placed a second letdown orifice in service for the power change
- At 80% reactor power, R-9 (Letdown Line Area Radiation Monitor), alarmed
- Crew reduced letdown to a single orifice in accordance with AOP-005, "Radiation Monitoring System"

Which ONE (1) of the following describes the basis for the requirement to reduce letdown flow based on the above information?

A. R-9 readings are normalized for a 45 gpm orifice in service.

B. Reduces the depletion rate of the mixed bed ion exchanger.

C. Reduces the amount of radionuclides recirced throughout the auxiliary building.

D. Allows a quicker purge to be done when chemistry obtains the required Iodine sample.

17. Given the following plant conditions:

- Model at 70% RTP
- Crew is performing a plant startup per GP-005, POWER OPERATION, to 100%
- Reactor operator withdraws control rods 5 steps for temperature control

Which ONE (1) of the following describes the plant response?

A. Feed regulating valves open to maintain S/G levels on program.

B. S/G pressure increases because the turbine is operating in IMP-IN.

C. Load increases due to the higher steam flow provided to the turbine.

D. Turbine governor valves throttle closed because the turbine is operating in IMP-OUT.

18. Given the following plant conditions:

- A plant startup per GP-005, POWER OPERATION, to 100%, is in progress
- Current reactor power is 7%.
- Reactor operator withdraws control rods three (3) steps for temperature control. Upon releasing the Rod Control switch, control rods continue to withdraw

Which ONE (1) of the following describes the correct operator response to this event?

A. Trip the reactor.

B. Attempt to insert rods by placing the Rod Control switch to IN.

C. Attempt to stop outward motion by depressing the Auto Rod Defeat button.

D. Attempt to stop outward motion by placing Rod Bank Selector switch in AUTO.

19. Using the attached parameter plots, which ONE (1) of the following describes the current RCS status?

A. PZR Steam space leak.

B. Leaking spray valve.

C. PZR reference leg leak

D. Leak from high pressure sensing line of LT-459

20. Given the following plant conditions:

- The crew is in Path 1
- RCS temperature is 385°F
- RCS pressure is 100 psig
- Containment pressure is 24 psig
- Off-site power is not available due to storm damage
- "A" EDG is inoperable
- "B" EDG is running
- The "B" EDG trips due to a transient. Six minutes later, it is restarted

Which ONE (1) of the following describes the required response of the crew with regards to the CCW system as a result of the above?

A. Start "C" CCW pump.

B. Do not attempt to restore CCW flow.

C. Verify "C" CCW pump restarted via the SI sequencer when power was restored.

D. Verify "C" CCW pump restarted via the Blackout sequencer when power was restored.

21. Given the following plant conditions:

- A reactor trip and SI have occurred
- Crew is in Path 1
- APP-001-D5, RHR PIT B HI-HI LEVEL, has illuminated
- Crew transitions to EPP-024, ISOLATION OF LEAKAGE IN THE RHR PIT

Which ONE (1) of the following procedures directed the transition to EPP-024?

A. Path-1

B. EPP-20, LOCA OUTSIDE CONTAINMENT

C. Foldout A

D. Foldout B

22. Given the following plant conditions:

- A reactor trip and SI has occurred
- Crew has responded IAW the EOP network
- Crew has entered EPP-009, TRANSFER TO COLD LEG RECIRCULATION due to low RWST level
- Shortly after entering EPP-009, the crew transitions to EPP-015, "LOSS OF EMERGENCY COOLANT RECIRCULATION"

Which ONE (1) of the following states conditions which would warrant this transition to EPP-015?

A. < 354 inches in the CV Sump **AND** no flow path from the CV Sump to the RCS.

B. < 354 inches in the CV Sump **OR** no flow path from the CV Sump to the RCS.

C. < 9% level in the RWST **OR** no flow path from the CV Sump to the RCS.

D. < 9% level in the RWST **AND** no flow path from the CV Sump to the RCS.

23. Given the following plant conditions:

- A reactor trip and SI have occurred
- Crew has responded IAW the EOP network
- All RCP's have been secured
- EPP-007, SI TERMINATION, is in progress
- SI, Phase A, and Phase B have been reset

Which ONE (1) of the following describes the minimum conditions and basis for starting an RCP?

A. RVLIS Upper Range > 100% **and** PZR level > 66%; Collapse void in the reactor vessel head.

B. RVLIS Upper Range > 100% **or** PZR level > 66%; Collapse void in the reactor vessel head.

C. RVLIS Full Range > 100% **and** RCS subcooling > 59 degrees; Establish saturated conditions in the PZR.

D. RVLIS Full Range > 100% **or** RCS subcooling > 59 degrees; Establish saturated conditions in the PZR.

24. Given the following plant conditions:

- Mode 1 at 100% RTP
- Two letdown orifices are in service; CVC-200A, 45 GPM ORIFICE ISOLATION, and CVC-200B, 60 GPM ORIFICE ISOLATION
- Pressurizer level is on program
- "A" charging pump is running in automatic
- "B" charging pump is in manual (45 gpm flow through the pump)
- All Seal Injection flows are 8 gpm each
- All Seal Return flows are 3 gpm each

Which ONE (1) of the following describes a correct plant response to a loss of electrical power to CVC-200A with **no operator action**?

If LC-459G, Pressurizer Level controller, is in:

A. automatic, the reactor will trip as a result of CVC-200A closing.

B. manual, the reactor will trip as a result of CVC-200A closing.

C. automatic, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

D. manual, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

25. Given the following plant conditions:

- RCS pressure is 1750 psig and slowly decreasing
- Reactor power is 100% RTP
- Reactor operator is unsuccessful in tripping the reactor

Which ONE (1) of the following correctly describes operator actions required for these conditions?

A. Verify turbine trip, verify E1 and E2 energized.

B. Insert control rods and dispatch an operator to the MG set room to trip the reactor trip breakers.

C. Check turbine trip as follows, verify both turbine stop valves and all govenor valves closed.

D. Insert control rods and dispatch an operator to the MG set room to trip Rod Drive Motor Generator set supply breakers.

26. Given the following plant conditions:

- The plant is shutdown < 200°F for refueling
- Preparations for head disassembly are in progress
- SRNI counts are:
  N31 = 900 cps
  N32 = 975 cps
- APP-005-C1, SR HI FLUX AT SHUTDOWN, is received

Which ONE (1) of the following describes a possible cause for the alarm?

A. Count rate on N31 increases to 1825 cps.

B. A source range detector cable is severed.

C. A SRNI detector voltage drifts low.

D. A SRNI detector voltage drifts high.

27. Given the following plant conditions:

- A plant startup is in progress IAW GP-005, POWER OPERATION
- The unit is at 50% RTP

Using Attachment 6.1 (PROVIDED), which ONE (1) of the following describes the point in the attachment when the Manager - Operations was required to be notified **and** why?

A. Row A; greater than 2% difference between N35 and N44.

B. Row B; greater than 2% difference between PI-446 (Turbine 1st Stage Steam Pressure) and N42.

C. Row C; greater than 5% difference between N41 and N44.

D. Row D; greater than 5% difference between PI-446 (Turbine 1st Stage Steam Pressure) and N42.

28. Given the following plant conditions:

- The crew is responding to multiple accident conditions
- S/G "C" is ruptured
- Path 2 has been entered and preparations are being made for dumping steam at the maximum rate from the intact S/G's
- Containment Pressure is 3.0 psig after peaking at 4.7 psig
- RCS Tcold is 492°F
- "C" S/G prssure is 250 psig above non-ruptured S/G pressure

Which ONE (1) of the following describes the required core exit temperature? Use the Attached table to make your determination.

A. 415°F

B. 435°F

C. 445°F

D. 465°F

29. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" condensate pump trips

Which ONE (1) of the following describes the **initial** feedwater system response to the above condition with **no operator action**?

All S/G feedwater regulating valves will:

A. close and both main feedwater pumps will trip.

B. close and only "A" main feedwater pump will trip.

C. open and only "A" main feedwater pump will trip.

D. open and both main feedwater pumps will trip.

30. Given the following plant conditions:

- A reactor trip and SI have occurred
- AFW flow < 300 gpm
- S/G WR levels are : "A"= 24%, "B"= 25%, "C" = 27%
- RCP's are secured
- RCS pressure is 2285 psig and increasing
- Crew initiates RCS bleed and feed

Which ONE (1) of the following describes the plant parameter/setpoint that directed the initiation of bleed and feed **and** the basis for it?

A. RCS pressure greater than 2280 psig; PZR PORV capability.

B. RCS pressure greater than 2280 psig; indication of imminent PORV lift.

C. 2 S/G WR levels less than 26%; PZR PORV capability.

D. 2 S/G WR levels less than 26%; indication of imminent S/G dryout.

31. Given the following plant conditions:

- Mode 1 at 100% RTP
- No scheduled releases are in progress
- A small leak develops from the bottom of Waste Condensate Tank "A"
- All ventilation systems are in a normal configuration

Which ONE (1) of the following identifies the best indication to alert the operators of an accidental liquid release in progress?

An increase in the level of monitor:

A. R-3, PASS Panel Area Monitor.

B. R-9, Letdown Line Area Monitor.

C. R-4, Charging Pump Room Area Monitor.

D. R-14C, Plant Effluent Noble Gas, Low Range Monitor.

32. Given the following plant conditions:

- Waste Gas Decay Tank (WGDT) "A" is the IN SERVICE tank and has an identified leak
- Waste Gas Decay Tank "B" is in STANDBY and will be placed IN SERVICE per AOP-009, ACCIDENTAL GAS RELEASE FROM A WGDT

Which ONE (1) of the following correctly describes the basis for placing Waste Gas Decay Tank "B" IN SERVICE instead of Waste Gas Decay Tanks "C" or "D" under these conditions?

A. All actions can be performed from the Waste Disposal Boron Recycle Panel. The operator does not have to enter the WGDT Valve Gallery which may be a high airborne area.

B. Most actions can be performed from the Waste Disposal Boron Recycle Panel. The operator has to spend limited time in the WGDT Valve Gallery which may be a high airborne area.

C. All actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

D. Most actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

33. Which ONE (1) of the following lists the RMS channels designed to provide indication during and after an accident when radiation levels and/or environmental specifications of the other channels may be exceeded?

1. R-1, Control Room
2. R-2, CV Low Range Monitor
3. R-11, CV Air or Plant Stack, Particulate
4. R-12, CV Air or Plant Stack, Noble Gas
5. R-14C, Plant Stack, Noble Gas, Low Range
6. R-14D, Plant Stack, Noble Gas, Intermediate or Mid Range
7. R-14E, Plant Stack, Noble Gas, High Range
8. R-30, Fuel Handling Building, Lower Level, High Range Noble Gas
9. R-31A, B, C Main Steam Lines
10. R-32A, B CV High Range

A. 3, 4, 6, 7, 9, 10

B. 1, 5, 6, 8, 9, 10

C. 2, 6, 7, 9, 10

D. 6, 7, 8, 9, 10

34. Given the following plant conditions:

- Mode 1 at 100% RTP
- LT 459, Pressurizer Level Transmitter, has failed low
- Crew enters AOP-025, "RTGB INSTRUMENT FAILURE"
- An operable level channel is selected and APP-003-C3, PRT HI PRESS, is received

CVC-460 A&B, LETDOWN ISOLATION STOPS
CVC-203A, LETDOWN RELIEF
CVC-209, LP LETDOWN RELIEF

Which ONE (1) of the following describes the cause of the PRT alarm?

A. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-203A lifted.

B. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-209 lifted.

C. Letdown isolation caused CVC-209 to lift.

D. Letdown isolation caused CVC-203A to lift.

35. Given the following plant conditions:

- The plant was operating at 100% RTP
- All systems are in their normal configuration
- A Loss of Off-Site Power occurred and EPP-001, LOSS OF ALL AC POWER, was entered
- The EDG's have been started from the RTGB and the output breakers closed
- Service Water pumps have been started by the blackout sequencer
- An SI occurs immediately after SW pumps started

Which ONE (1) of the following best describes the Safeguards Sequencer response to this event?

The Blackout sequencer will:

A. continue to completion, any additional equipment will be started by the SI sequencer.

B. continue to completion, any additional equipment will require a manual start.

C. stop, all loads will be stripped and restarted by the SI sequencer.

D. stop, the SI sequencer will start the required additional loads.

36. Given the following plant conditions:

- FRP-H.2, RESPONSE TO S/G OVERPRESSURE, is in effect
- STA is monitoring CSFST's
- The crew is monitoring the affected S/G level as directed by procedure

Which ONE (1) of the following correctly describes the importance for monitoring level?

If S/G level :

A. is > 90%, then transition to FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, is required.

B. is > 90%, the S/G water level may be above the narrow range or the the S/G may be in a water solid condition.

C. remains < 90%, then the crew is assured that a SGTR is not occurring.

D. remains < 90%, then the steam dumps have been operating successfully.

37. Given the following plant conditions:

- Mode 1 at 60% RTP
- The rods are selected to MANUAL
- Control rod (M-6) drops to the bottom of the core

Which ONE (1) of the following describes the **initial** integrated plant response to the rod drop and the reason for the response? **(Assume no operator action)**

A. APP-003-F3, CHG PMP LO SPEED, illuminates due to the reactivity inserted by the dropped rod.

B. APP-003-F3, CHG PMP LO SPEED, illuminates due to mismatch between reactor power and steam demand.

C. APP-003-F4, CHG PMP HI SPEED, illuminates due to mismatch between reactor power and steam demand.

D. APP-003-F4, CHG PMP HI SPEED, illuminates due to the reactivity inserted by the dropped rod.

38. Given the following plant conditions:

- Mode 1 at 95% RTP
- A flux tilt of 1.038 exists
- Rod K-14 appears to be misaligned
- This condition cannot be corrected for at least 2.5 hours

Using ITS 3.2.4 (ATTACHED), which ONE (1) of the following correctly describes the correct power reduction **and** time frame to accomplish this power reduction?

Reduce core power to:

A. 88.6% within 1 hour.

B. 83.6% within 1 hour.

C. 88.6% within 2 hours.

D. 83.6% within 2 hours.

39. Given the following plant conditions:

- Mode 1 at 35% RTP
- Two charging pumps are running
- The following RCP indications are observed:

	RCP "A"	RCP "B"	RCP "C"
o RCP motor bearing temperatures	180°F	180°F	210°F
o #1 seal leakoff temperatures	150°F	150°F	165°F
o Thermal barrier delta P	10"	10"	8"

Which ONE (1) of the following describes the action(s) required for this condition?

A. Stop "C" RCP, shutdown IAW GP-006, Normal Plant Shutdown From Power Operation To Hot Shutdown, and be in Mode 3 within 6 hours.

B. Throttle CVC-297C, "C" RCP Seal Water Flow Control valve, to obtain between 8 and 13 gpm flow to each "C" RCP Seals.

C. Close CVC-303C, "C" RCP Seal Leakoff valve.

D. Trip the reactor, stop RCP "C".

40. Given the following plant conditions:

- Plant has experienced a loss of off-site power
- Reactor trip & turbine trip have been verified
- Crew entered EPP-001, LOSS OF ALL AC POWER, until the inside AO restored power to E-2 per Attachment 6 of EPP-001.
- Crew has returned to Path-1
- No SI has occurred or is required

Which ONE (1) of the following correctly describes how "Verify two charging pumps running" of PATH-1 will be completed?

Operator will start ___ charging pump from the "B" EDG and then ____charging pump from the DS bus after energizing it from the DS EDG per EPP-025, ENERGIZING SUPPLEMENTAL PLANT EQUIPMENT USING THE DSDG

A. "B" ; "A"

B. "C" ; "B"

C. "B" ; "C"

D. "C" ; "A"

41. Given the following plant conditions:

- The RCS is on RHR and solid
- RCS pressure is 350 psig
- RCS temperature is stable
- HIC-142, LETDOWN, controller setting is at 40% demand
- PC-145, PRESSURE, is in AUTO
- The Reactor operator adjusts HIC-142 controller to 80% demand

Which ONE (1) of the following statements is correct?

A. Letdown pressure increases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure decreases.

B. Letdown pressure increases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure decreases.

C. Letdown pressure decreases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure increases.

D. Letdown pressure decreases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure increases.

42. Given the following plant conditions:

- A DBA LOCA has occurred
- An electrical fault results in a loss of E-1

Which ONE (1) of the following describes the effects of the loss of E-1 on containment conditions?

A. Adequate equipment is operating to provide the required cooling for containment in this event.

B. With the start of an additional SW booster pump, adequate equipment is operating to maintain containment conditions within design limits.

C. With the start of an additional CV spray pump, adequate equipment is operating to maintain containment conditions within design limits.

D. With the start of an additional HVH unit, adequate equipment is operating to maintain containment conditions within design limits.

43. Given the following plant conditions:

- Reactor trip and SI have occurred
- Failure of SI status lights has occurred
- CRSS has directed the RO to verify the CVCS related SI valves CLOSED using RTGB indication

Which ONE (1) of the following correctly describes the CVCS valves required to be verified closed?

A. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Line Isol valves (CVC-204A & 204B)

B. Letdown Line Isol valves (CVC-204A & 204B) and Letdown Stop valves (CVC-460A & 460B)

C. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Stop valves (CVC-460A & 460B)

D. Letdown Line Isol valves (CVC-204A & 204B) and Seal Water Return Isol valve (CVC-381)

44. Given the following plant conditions;

- Mode 1 at 100% RTP
- All control systems are in automatic

Assuming no operator action, which ONE (1) of the following describes the response of the rod control system if Power Range Nuclear Instrument Channel N-44 fails full upscale?

A. No rod movement will occur because of the Overpower rod stop from N-44 failure.

B. Nuclear power - Turbine power mismatch signal steps rods in until the signal decays, then rod motion stops.

C. Nuclear power - Turbine power mismatch signal steps rods in until the Tavg-Tref mismatch signal overrides it.

D. Nuclear power - Turbine power mismatch signal steps rods in as long as N-44 is energized.

45. Given the following plant conditions:

- The plant was initially at 95% RTP and increasing following a refueling outage
- The reactor has tripped
- Compensating voltage on N-35, Intermediate Range NI, is set too high

Which ONE (1) of the following describes the response of Intermediate Range N-35 to the improperly set compensating voltage?

A. Indicates LOW; causing P-6 to energize the Source Range instruments prematurely.

B. Indicates HIGH; preventing P-6 from automatically energizing the Source Range instruments.

C. Indicates HIGH; the Source Range instruments will be energized by P-6 from the other IR channel (N-36).

D. Indicates LOW; the Source Range instruments will be energized when P-6 is satisfied by the other IR channel (N-36).

46. Given the following plant conditions:

- Mode 1 at 100% RTP
- An NAS Assessment identifies that the feedwater temperature indicators are inaccurate
- It is determined that the feedwater temperature detectors shows an indicated temperature that is LOWER than ACTUAL
- These readings were used in OST-10, POWER RANGE CALORIMETRIC DURING POWER OPERATION DAILY
- The power range detectors were adjusted using the OST

Which ONE (1) of the following correctly describes the results of the feedwater error on the power range calorimetric?

Indicated power is _______than calculated power causing a _______conservative NI setting.

A. LOWER; MORE

B. HIGHER; MORE

C. LOWER; LESS

D. HIGHER; LESS

47. Given the following plant conditions:

- APP-036-01, CH A ICCM SYS MALF is illuminated

Which ONE(1) of the following describes the RVLIS component that could cause this alarm to actuate and what condition is it indicating?

A microswitch located in the:

A. Sensor Bellows; RCS leak.

B. Sensor Bellows; capillary line leak.

C. Hydraulic Isolator; RCS leak.

D. Hydraulic Isolator; capillary line leak.

48. Which ONE (1) of the following describes the difference between an automatic and a manual spray actuation?

A. Containment Phase B Isolation and Containment Ventilation Isolation only occur on a manual actuation.

B. Containment Phase B Isolation and Containment Ventilation Isolation only occur on an automatic actuation.

C. Safety Injection and Steamline Isolation only occur on a manual actuation.

D. Safety Injection and Steamline Isolation only occur on an automatic actuation.

49. Given the following plant conditions:

- Crew is in FRP-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL
- S/G levels are as follows:

	S/G "A"	S/G "B"	S/G "C"
◊ Wide range levels	27%	7%	29%

- AFW flowrate to each S/G is 70 gpm

Which ONE (1) of the following describes the allowed AFW flow rates to the S/G's?

Establish AFW flow:

A. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 80 gpm to S/G "B" until WR level is >9%.

B. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 100 gpm to S/G "B" until WR level is >9%.

C. less than or equal to 80 gpm to each S/G until NR level is >10%.

D. less than or equal to 100 gpm to each S/G until NR level is >10%.

50. Given the following plant conditions:

- Mode 1 at 30% RTP
- A reactor trip occurs
- All systems operate as expected
- Tave = Tref.

Which ONE (1) of the following correctly describes the status of secondary plant components for the above conditions?

A. Feed regulating valves open, feed regulating bypass valves open.

B. Feed regulating valves open, feed regulating bypass valves closed.

C. Feed regulating valves closed, feed regulating bypass valves open.

D. Feed regulating valves closed, feed regulating bypass valves closed.

51. Given the following plant conditions:

- The plant has experienced a reactor trip and safety injection
- Foldout "A" is in effect
- Condensate Storage Tank level is 8%
- RCS temperature is 475°F

FCV-6416, SDAFW PUMP DISCHARGE FLOW CONTROL VALVE
FCV-1424, "A" MDAFW PUMP DISCHARGE FLOW CONTROL VALVE
FCV-1425, "B" MDAFW PUMP DISCHARGE FLOW CONTROL VALVE

Which ONE (1) of the following describes the applicable AFW flowrate limitation **and** the basis for the limitation?

If only the :

A. SDAFW pump is running, then FCV-6416 is set at 600 gpm to prevent exceeding the maximum flow delivery rate of the Service Water system.

B. SDAFW pump is running, then FCV-6416 is set at 500 gpm to ensure that the maximum design flowrate to a faulted S/G will not be exceeded.

C. MDAFW pumps are running, then FCV-1425, is set at 325 gpm and FCV-1424 is set at 155 gpm to prevent exceeding the maximum flow delivery rate of the Service Water system and runout of "A" MDAFW pump.

D. MDAFW pumps are running, then FCV-1424 is set at 325 gpm and FCV-1425 is set at 275 gpm to prevent exceeding the maximum flow delivery rate of the Service Water system and runout of "A" MDAFW pump.

52. Which ONE (1) of the following describes the basis for the length of time for which Station Battery capacity is designed?

To ensure that sufficient required power is available to shutdown the reactor:

A. and maintain it in a safe condition after a DBA.

B. or maintain it in a safe condition after a DBA.

C. and allow adequate time to align power from emergency backfeed.

D. or allow adequate time to align power from emergency backfeed.

53. Given the following plant conditions:

- GP-002, COLD SHUTDOWN TO HOT SUBCRITICAL AT NO LOAD Tavg, is in progress
- All systems are in a normal lineup for the plant condition

Which ONE (1) of the following describes an action that would cause PCV-1027, COVER GAS HEADER PRESSURE CONTROL, to automatically close?

A. An automatic makeup.

B. Dilution to Mode 3 SDM.

C. Processing of a CVCS Holdup Tank.

D. CVC-209, LP LETDOWN RELIEF, lifts.

54. Given the following plant conditions:

- Mode 1 at 100%
- A liquid and a gaseous release are in progress
- APP-010-B7, HVE-2A/B AIR FLOW LOST/OVLD, annuciator is illuminated
- Standby fan does not start

Which ONE (1) of the following correctly describes the proper crew response to this condition?

Secure the:

A. liquid rad waste release and notify RC Personnel of the possibility of an unmonitored release due to pressurization of the Auxiliary Building.

B. liquid rad waste release and notify RC Personnel of the possibility of forming a vacuum in the Auxiliary Building.

C. gaseous rad waste release and notify RC Personnel of the possibility of an unmonitored release due to pressurization of the Auxiliary Building.

D. gaseous rad waste release and notify RC Personnel of the possibility of forming a vacuum in the Auxiliary Building.

55. Given the following plant conditions:

- Mode 1 at 100% RTP
- A liquid release is in progress
- All systems are in a normal lineup and functioning properly

Which ONE (1) of the following identifies a Control Room indication that allows monitoring of the release?

A. Position of RCV-018, LIQUID WASTE EFFLUENT ISOLATION.

B. R-18, LIQUID WASTE DISPOSAL EFFLUENT.

C. YIC-1676, LIQUID RELEASE TOTALIZER.

D. FI-1064, RELEASE FLOW RATE.

56. Given the following plant conditions:

- Mode 3
- A release is in progress from "B" Waste Gas Decay Tank
- R-14C, PLANT STACK NOBLE GAS LOW RANGE, FAIL light illuminates

Which ONE (1) of the following conditions in the Control Room would also exist **and** what would be the effect of the above condition on RCV-014 (WASTE GAS RELEASE ISOLATION)?

A. APP-036-E7, RTGB RAD MONITOR TROUBLE; open.

B. APP-036-E7, RTGB RAD MONITOR TROUBLE; closed.

C. APP-036-D8, RTGB PROCESS MONITOR HI RAD; open.

D. APP-036-D8, RTGB PROCESS MONITOR HI RAD; closed.

57. Given the following plant conditions:

- Mode 1 at 100% RTP
- A release is in progress from Waste Gas Decay Tank "A"
- A loss of Instrument Bus 2 occurs

Which ONE (1) of the following describes the effect on the release based upon the instrument bus loss?

The release:

A. is automatically terminated due to loss of R-14 (PLANT VENT MONITOR).

B. must be manually terminated due to loss of R-14 (PLANT VENT MONITOR).

C. must be manually terminated due to loss power to the Waste Disposal Boron Recycle Panel.

D. is automatically terminated due to loss of power to the Waste Disposal Boron Recycle Panel.

58. Which ONE (1) of the following contains a correct association between a Radiation Monitor **and** the basis for its alarm setpoint?

A. R-14C, Plant Vent Lo Range Noble Gas; 10CF20 most restrictive dose rate of 1500 mr/yr to any organ.

B. R-14D, Plant Vent Mid Range Noble Gas; 50 mr/hr at site boundary for a release of 30 minutes duration.

C. R-30, Fuel Handling Building Lower Level Hi Range; 3000 mr/yr to the skin.

D. R-31A, B, C, Main Steam Line; one quarter of their range.

59. Given the following plant conditions:

- Mode 5
- The RCP Seal Injection filter has just been changed out
- HP placed the filter in a one inch thick lead container
- The container is on a pallet outside of the Charging Pump Room
- There is effectively 2 inches of steel between the container and the R-4 (CHARGING PUMP ROOM MONITOR) detector
- The activity source in the filter is primarily Cobalt-60
- The container is 8 feet away from R-4 detector, and R-4 reads 5 mr/hr
- Prior to placement of the container, R-4 read 1 mr/hr

Which ONE (1) of the following identifies the correct R-4 reading if the container is moved to 16 feet away from R-4 detector?

A. 1.25 mr/hr

B. 2.0 mr/hr

C. 2.5 mr/hr

D. 3.0 mr/hr

60. During a drain of the RCS IAW GP-008, DRAINING THE REACTOR COOLANT SYSTEM, the hoses connected to the Pressurizer Relief loop seal drains are required to be removed after the seals are drained.

Which ONE (1) of the following provides the correct reason for removing these hoses?

A. AP-010, Housekeeping Instructions. Hoses are a trip hazard and want to minimize the potential for falls inside Containment.

B. Radiactive material issue. Need the hoses for additional drains which minimizes the amount of radioactive hoses generated by not having seperate hoses for each drain evolution.

C. MMM-010, Cleanliness and Flushing. If end of hose became submerged, could siphon water from the floor drain into the RCS and introduce contaminants.

D. Vent path concern. Eliminates the potential for hose collapse which would prevent air draw.

61. Given the following plant conditions:

- Shutdown following a reactor trip and safety injection
- RCS pressure is 5 psig
- EPP-10, TRANSFR TO LONG TERM RECIRCULATION, is in progress
- SI-869, SI HOT LEG HDR, is open
- SI-866A, LOOP 3 HOT LEG INJ, is open
- RHR pump "A" is started
- SI pump "A" is started
- You are unable to start an additional SI pump

The procedure directs you to establish Alternate Hot Leg Recirc. Which ONE (1) of the following describes the correct lineup for ECCS based on the above conditions?

A. No SI pump, SI-869 closed and RHR-750 and RHR-751, RHR LOOP SUPPLIES, opened.

B. One SI pump; RHR-759A and RHR-759B, RHR HX DISCHARGES, throttled open.

C. No SI pump, SI-869 closed and SI-863A, RHR LOOP RECIRC, opened.

D. One SI pump; SI-866B, LOOP2 HOT LEG INJ, opened.

62. Which ONE (1) of the following identifies the correct power supply to the Master Pressure Controller?

A. Instrument Bus #3

B. Instrument Bus #4

C. Instrument Bus #5

D. Instrument Bus #6

63. Given the following plant conditions:

- Mode 1 at 100% RTP
- PC-444J fails high

Which ONE (1) of the following describes the correct plant response if **NO** operator actions are taken?

A. All pressurizer heaters energize as plant pressure decreases.

B. Pressurizer Spray valves shut and the PORV's cycle to control pressure.

C. A reactor trip and safety injection occur on low Pressurizer pressure.

D. An OPΔT trip occurs.

64. Given the following plant conditions:

- Mode 1 at 100% RTP
- The crew is making preparations to commence a normal shutdown. A boration is in progress
- As part of the preparations, an additional letdown orifice is being placed in service
- The operator misses the step to adjust charging flow to match the expected letdown flow

Which ONE (1) of the following describes a plant response/indication resulting from the missed step?

A. VCT level decreases.

B. Charging pump speed decreases.

C. APP-001-B6, LP LTDN LN HI TEMP, illuminated.

D. TCV-143, VCT/DEMINERALIZER DIVERSION, diverts to VCT.

65. Given the following plant conditions:

- Mode 1
- A normal plant shutdown IAW GP-006 is in progress
- NIS: N41 = 9%, N42 = 9%, N43 = 9%, N44 = 10%
- Turbine first stage pressure is 60 psig
- "B" RCP trips due to a breaker malfunction

Which ONE (1) of the following describes the plant condition?

The plant is:

A. greater than P-7. The reactor trips.

B. greater than P-7. The reactor does not trip.

C. less than P-7. The reactor trips.

D. less than P-7. The reactor does not trip.

66. Which ONE (1) of the following describes the relationship between Individual Rod Position Indication (IRPI) and its associated Group Step Counter?

   A. IRPI uses a completely independent signal from the Group Step Counters.

   B. IRPI develops an output signal from an input signal provided by the Group Step Counters.

   C. The Group Step Counters and IRPI both receive the same input signal and develop individual outputs.

   D. The Group Step Counters develop an output signal from an input signal provided by IRPI.

67. Given the following plant conditions:

- Mode 4 for a forced outage
- Maintenance work is being performed on HVH-1, CV Air Recirculation Cooling
- A fire breaks out in Station Service Transformer 2G
- EDG "B" starts, trips off, and can not be restarted

Using the copy of ITS 3.6.6 provided, which ONE (1) of the following describes the action that must be taken based upon the current plant conditions?

A. Restore at least one Containment cooling train to service within 72 hours

B. Restore CV spray train to service within 72 hours

C. Enter LCO 3.0.3

D. Be in Mode 5 in 84 hours

68. Given the following plant conditions:

- Mode 1 at 100% RTP
- The daytime temperature is 105°F, CV pressure reads 0.2 psig
- The predicted night time low is 55°F with a high pressure area.

Which ONE (1) of the following describes the expected response of CV pressure **and** applicable required actions?

A. Increase, no actions required.

B. Increase, open CV vacuum reief valves.

C. Decrease, open CV vacuum relief valves.

D. Decrease, verify CV vacuum valves open automatically.

69. Given the following plant conditions:

- Mode 1 at 100% RTP and have been on-line for 15 days after a refueling outage
- The outside air temperature is 105°F
- APP-036-B4, SPENT FUEL PIT TEMP HI/LO, is received
- SFP temperature is 122°F

Which ONE (1) of the following describes a possible cause for this alarm?

A. A leak in the SFP.

B. Making up to the SFP.

C. Removing the SFP filter from service.

D. Bypassing the SFP demineralizer.

70. Which ONE (1) of the following will cause the amount of natural circulation present to change?

A. A change in S/G level from 50% NR to 20% NR.

B. A change in S/G level from 75%WR to 40%WR.

C. Go from 45% Pressurizer level to 92% RVLIS Full Range.

D. Go from 70% RVLIS Full Range to 90% RVLIS Full Range.

71. Given the following plant conditions:

- RCS T-cold is 175°F, Pressure is 345 psig
- RHR is aligned for core cooling
- "A" RHR is running, "B" RHR is in standby
- "A" S/G is drained for maintenance
- "C" S/G is drained for maintenance
- It is desired to place "B" RHR pump out of service to conduct maintenance scheduled to take 6 hours

Which ONE (1) of the following describes the condition that must be satisfied in the "B" S/G in order to allow the RHR maintenance without entering an LCO?

Operable with:

A. level at least 10% (NR).

B. level at least 16% (NR).

C. temperature not >50°F higher than RCS T-cold.

D. temperature not >50°F lower than RCS T-cold.

72. Given the following plant conditions:

- Mode 1 at 85% RTP
- LCV-1530A, HDT LEVEL CONTROL VALVE, air supply piping develops a significant leak
- The AO is directed to isolate to LCV-1530A
- The AO inadvertently isolates air to LCV-1530B, HEATER DRAIN PUMPS SUCTION DUMP TO CONDENSER

Which ONE (1) of the following describes how these valves respond to the above plant conditions ?

A. LCV-1530A closes and LCV-1530B opens.

B. LCV-1530A position does not change and LCV-1530B position does not change.

C. LCV-1530A opens and LCV-1530B closes.

D. LCV-1530A position does not change and LCV-1530B opens.

73. Given the following plant conditions:

- Mode 1 at 100% RTP
- Vacuum pump "A" is running
- Vacuum pump "B" is selected to AUTO

Which ONE (1) of the following describes the correct operation of the vacuum pumps?

A. At 25.5 inches Hg decreasing, "B" automatically starts and at 27.0 inches Hg increasing, "B" automatically stops.

B. At 25.5 inches Hg decreasing, "B" automatically starts and "B" must be manually stopped and returned to AUTO.

C. All running pumps will shift to "hogging" mode at 25 inches Hg decreasing.

D. All running pumps will shift to "jetting" mode at 27 inches Hg increasing.

74. Which ONE (1) of the following states the correct 480VAC bus supply for the "B" Spent Fuel Pit pump?

A. Bus 5

B. Bus 3

C. Bus 2

D. Bus 1

75. Given the following plant conditions:

- Mode 1 at 100% RTP
- Breaker 52/20, UAT TO 4160V BUS 4, trips on defect

Which ONE (1) of the following provides a correct plant response?

A. Loss of "A" condensate pump, "A" Feed pump auto trip, manual reactor trip required due to >80% RTP.

B. Automatic reactor trip due to >P-8 and loss of RCP "A".

C. Loss of "B" Feed pump, manual reactor trip not required due to automatic trip from loss of "C" RCP >P-8.

D. Automatic reactor trip due to >P-8 and loss of RCP "B".

76. Which ONE (1) of the following describes an effect of losing the "A" DC bus?

   A. Safety injection actuates.

   B. Safety injection will not automatically initiate.

   C. EDG "A" starts automatically but does not flash.

   D. EDG "A" starts automatically and flashes normally.

77. Given the following conditions:

- Mode 1 at 100% RTP
- You have been assigned to perform OST-401-2, EDG "B" Slow Speed Start
- Engine speed has just been adjusted to 60hz
- Recorded generator voltage is as follows:
  - 470v on Generator Panel Voltmeter
  - 478v on ERFIS Point DGV3027A

Which ONE (1) of the following describes the appropriate actions for these conditions?

EDG voltage is:

A. acceptable. Proceed with the OST.

B. not acceptable. Declare the EDG inoperable.

C. acceptable. Adjust voltage regulator to 480v.

D. not acceptable. Adjust voltage regulator to 480v.

78. Which ONE (1) of the following describes the correct location where the sample lines for R-16 (CV HVH COOLING WATER) tie into the Service Water system?

A. Downstream of the HVH unit discharge isolation valves, outside of the CV.

B. Downstream of the HVH unit discharge isolation valves, inside of the CV.

C. Upstream of the HVH unit discharge isolation valves, outside of the CV.

D. Upstream of the HVH unit discharge isolation valves, inside of the CV.

79. Which ONE (1) of the following describes a correct operation of the Motor Driven Fire Pump (MDFP)?

The MDFP is :

A. manually started from the Control Room when any fire alarm is received.

B. automatically started whenever Fire Header pressure falls to 115 psig.

C. automatically started when any fire suppression system is manually actuated.

D. manually secured from the Control Room when fire water is no longer required.

80. Which ONE (1) of the following describes a plant condition where SI-863A and SI-863B (RHR TO SI AND CV SPRAY SUCTION) are closed?

A. Long-term recirc with RCS pressure <125 psig.

B. Long-term recirc with RCS pressure >125 psig.

C. High head-low flow injection.

D. RHR flow <1200 gpm.

81. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" CCW pump is running
- All equipment is in a normal lineup
- A lightning strike causes a major disruption on the grid
- The turbine trips due to the transient
- All off-site power is lost
- EDG "B" is under clearance

Which ONE (1) of the following describes which CCW pump(s) will be running two minutes after the trip?

A. No CCW pumps running.

B. "B" CCW pump running.

C. "A" CCW pump running.

D. "C" CCW pump running.

82. Which ONE (1) of the following describes the CV Hydrogen concentration that will require arrangements be made for delivery of the Hydrogen Recombiner following a SBLOCA?

A. 0.3% and stable.

B. 0.3% and increasing.

C. 7.5% and stable.

D. 7.5% and decreasing.

83. Given the following plant conditions:

- Mode 1 at 100% RTP
- Control Rods are selected to MANUAL for performance of an OST
- A leak develops in the Electro-Hydraulic Control system
- Turbine load begins to slowly decrease
- APP-006-F5, STEAM DUMP ARMED, illuminates

Which ONE (1) of the following correctly describes the response of the steam dump control system?

A. Steam dump bank 1 modulating open.

B. Steam line PORVs modulating open.

C. Steam dump bank 1 tripped open.

D. Steam dump bank 2 modulating open.

84. Which ONE (1) of the following describes the Reactor Protection System Power Range High Flux Trip Low Setpoint?

A. May be manually blocked when one of four PRNI channels are >P-10.

B. Automatically unblocked when two of four PRNI channels are <P-10.

C. Provides protection against reactivity excursions too rapid for OTΔT trips at low power.

D. Provides protection against power excursions during a startup.

85. Which ONE (1) of the following describes the operation of the Service Water Booster Pumps?

A. With SI sequencer, will start regardless of suction pressure to maintain Service Water pressure inside CV during a DBALOCA.

B. With SI sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water pressure inside CV during a DBALOCA.

C. With Blackout sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water to at least one CV Air Recirculation unit.

D. With Blackout sequencer, will start regardless of suction pressure to maintain Service Water to at least one CV Air Recirculation unit.

86. Given the following plant conditions:

- Mode 1 at 100% RTP
- Condensate Polisher regeneration is in progress
- The Instrument Air system is in a normal lineup
- APP-002-D7, INST AIR COMP A/B OVLD, is received
- PI-1702, INSTRUMENT AIR HEADER PRESSURE, reads 93 psig, slowly decreasing
- The AO reports that the breaker for Instrument Air Compressor "B" is tripped

Which ONE (1) of the following describes the expected condition of the remaining Instrument Air compressors?

A. "A" running, "D" running and loaded.

B. "A" running, "D" running but unloaded.

C. "A" not running, "D" running and loaded.

D. "A" not running, "D" running but unloaded.

87. Given the following plant conditions:

- The Plant is shutdown following a reactor trip and safety injection
- CV pressure during the event peaked at 9 psig and now reads 3 psig
- You are directed by Path 1 to "RESET PHASE A AND PHASE B"

Which ONE (1) of the following describes the indications that you will see on the RTGB when this step is performed?

A. All of the Phase A&B component lights turn from pink to blue.

B. APP-002-D2, CV ISOL PHASE B, extinguishes.

C. APP-002-C2, CV ISOL PHASE A, extinguishes.

D. PCV-1716, INST AIR ISO TO CV, opens.

88. Which ONE (1) of the following describes a Grid System Alert condition what may or may not be performed during this condition?

During a System:

A. Reliability Alert, delay High Risk surveillances with a frequency of longer than quarterly without including the 25% grace period.

B. Economics Alert, reschedule High Risk quarterly surveillances without including the 25% grace period.

C. Reliability Alert, perform weekly High Risk surveillances as scheduled.

D. Economics Alert, all available generation sources are anticipated to be used.

89. Given the following plant conditions:

- You are in AOP-022, LOSS OF SERVICE WATER, SECTION "A"
- You have dispatched an operator to perform step 4
- PI-1684, SOUTH SW HEADER PRESSURE, indicates 37 psig and is stable
- "B" and "C" Circ water pumps are running

Using the attached AOP-022, SECTION "A", which ONE (1) of the following contains the correct actions that you should take in continuing with the procedure?

A. Perform RNO for step 5, go to step 9.

B. Perform steps 5 and 6, wait at step 7 until SW-188 is CLOSED, then go to step 9.

C. Perform RNO for step 5, perform step 6, go to step 9 while SW-188 is being CLOSED.

D. Once step 5 is completed, perform step 6, wait at step 7 until SW-188 is CLOSED, then go to step 8.

90. Which ONE (1) of the following plant conditions are definitive of Mode 2?

A. Keff <0.99.

B. Keff >0.99.

C. Shutdown Bank "A" greater than 20 inches.

D. Shutdown Bank "A" greater than 20 steps.

91. Given the following plant conditions:

- Mode 2
- Reactor startup in progress IAW GP-003, NORMAL PLANT STARTUP FROM HOT SHUTDOWN TO CRITICAL
- The reactor is stable, Keff<1
- Stable power levels are:
  - Highest SR=22,000 cps
  - Highest IR=1.8×10^{-11} amps
- Rod positions are:
  - Control Bank "C" @ 202 steps
  - Control Bank "D" @ 74 steps

Using the ATTACHMENT 6.2 provided, which ONE (1) of the following provides the closest correct lowest projected criticial position?

Control Bank "D" at:

A. 92 steps (SR)

B. 114 steps (IR)

C. 220 steps (SR)

D. 218 steps (IR)

92. Given the following plant conditions:

- Mode 3, after a trip that occurred 5 hours ago
- Pre-startup preparations are in progress, criticality scheduled for 8 hours from now
- Reactor trip breakers are open
- An Estimated Critical Condition has been prepared for the startup
- ECC RCS boron is 670 ppm
- Mode 3 SDM is 720 ppm
- Present RCS boron concentration is 680 ppm

Which ONE (1) of the following describes the required action to take to adjust RCS boron concentration?

A. Borate to 720 ppm, then withdraw SD Bank "A"

B. Withdraw SD Bank "A", then borate to 720 ppm

C. Dilute to 670 ppm, then withdraw SD Bank "A"

D. Withdraw SD Bank "A"and dilute to 670 ppm

93. Which ONE (1) of the following describes a correct action for making a boundary change on a clearance?

A. All work activities within the scope of the clearance shall be suspended for all boundary changes.

B. Must notify clearance holders (or designated alternate if off-site) for all boundary changes.

C. Temporary Tag Lifts should be restored within the shift that they were lifted.

D. If the clearance holder is not on site, can make the changes but must notify the clearance holder as soon as practical.

94. Given the following plant conditions:

- Mode 1 at 100% RTP
- A Pressurizer PORV failure has occurred
- RCS pressure reached 2000 psig during the fault and is increasing after operator actions
- RCS temperature is Tref +2°F
- Rods are in manual

Which ONE (1) of the following describes the correct evaluation of plant conditions **and** required actions with regards to core safety limits? [SAFETY LIMITS ATTACHED]

A. Violated SL 2.1.1. Must restore compliance and be in Mode 3 within one hour.

B. Always complied with SL 2.1.1. No actions required per safety limits.

C. Violated SL 2.1.1. Must restore compliance within one hour or be in Mode 3.

D. SL 2.1.1 is not applicable during transients. No actions required per safety limit.

95. Given the following plant conditions:

- Mode 1 at 100% RTP
- You have been directed to enter Containment to perform a task
- Your RWP states that your EPD dose alarm will be set at 80 mrem and your rate alarm will be set at 160 mrem/hr
- As you log-in using the Automated Access Control System, the computer screen warns you that RIMS is not operational

Which ONE (1) of the following describes the settings for your EPD dose and rate alarms **and** what is the appropriate response to a Dose alarm while you are performing the task?

A. Dose- 50mrem; Rate 100 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

B. Dose- 50mrem; Rate 100 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

C. Dose- 40mrem; Rate 80 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

D. Dose- 40mrem; Rate 80 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

96. Given the following plant conditions:

- Mode 6
- A CV purge is being established per OP-921, CONTAINMENT AIR HANDLING
- The Containment Personnel Airlock Doors will not remain open throughout the purge

Which ONE (1) of the following describes the effect this will have on the Auxiliary Building?

The Auxiliary building will:

A. pressurize unless HVS-1 is running.

B. pressurize unless HVS-1 is secured.

C. depressurize unless HVS-1 is running.

D. depressurize unless HVS-1 is secured.

97. Given the following plant conditions:

- Mode 5
- RCS pressure is 330 psig
- Chemistry has just added H_2O_2 (Hydrogen Peroxide) to the RCS

Which ONE (1) of the following describes an effect this chemical addition will have on the plant?

A. Radiaton levels will initially decrease in the letdown line.

B. The H_2O_2 will convert to water because RCS temperature is >200 degrees.

C. Cummulative exposure during the refueling will be reduced.

D. A sufficient hydrogen inventory will exist to scavenge oxygen.

98. Which ONE (1) of the following contains indications that all lead to entry into FRP-C.1, RESPONSE TO INADEQUATE CORE COOLING?

A. 2 RCP's running, CET's 705°F, RVLIS dynamic head 36%.

B. 1 RCP running, CET's 1135°F, RVLIS dynamic head 20%.

C. CET's 585°F, RVLIS full range 31%.

D. CET's 705°F, RVLIS full range 36%.

99. During EPP-6, NATURAL CIRCULATION COOLDOWN WITH A STEAM VOID IN THE VESSEL, you are directed to establish Pressurizer level between 20-25%. Which ONE (1) of the following states the correct reason for establishing this low Pressurizer level?

This level is established prior to cooldown in order to:

A. provide additional static head to enhance natural circulation.

B. ensure natural circulation flow is not disrupted.

C. ensure the accommodation of void growth.

D. provide a method to monitor void growth.

100. Given the following plant conditions:

- The Unit is in FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
- All immediate actions have been performed
- Emergency boration is in progress
- AFW is in operation, all S/G's are 8% (NR)
- RCS pressure is 2300 psig

Which ONE (1) of the following desribes the feed flow requirement **and** the basis for it?

A. AFW flow > 300 gpm to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

B. AFW flow > 600 gpm to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

C. FW bypass flow >0.2 x 10^6 pph to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

D. FW bypass flow >0.4 x 10^6 pph to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

Test Name: 981NRCRO.TST
Test Date: Thursday, June 10, 1999

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	1	RODCNTRL	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	2	RCP	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	3	EPP-005	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	4	EPP-006	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	5	AOP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	6	EPP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	EPP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	8	OMM	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	9	EPP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	10	AFW	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	11	AOP-024	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	12	AOP-024	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	13	AOP-004	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	14	CV INTEGRITY	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	15	CV	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	16	AOP-005	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	17	SD-032	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	18	AOP-001	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	19	AOP-016	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	20	AOP-014	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	21	EPP-024	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	22	EPP-009	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	23	EPP-007	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	24	AOP	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	25	FRP-S.1	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	26	NI	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	27	NI	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	28	PATH-2	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	29	AOP-010	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	30	FRP-H.1	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	31	AOP	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	32	AOP-009	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	33	RMS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	34	AOP-025	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	35	EPP-001	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	36	FRP-H.2	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	37	AOP-001	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	38	TS-3.2.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	39	AOP-014	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	SD-021	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	41	SD-003	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	42	SD-006	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	43	SD-002	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	44	SD-010	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	SD-010	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	46	SD-010	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	47	SD-015	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	48	SD-006	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	49	FRP-H.5	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	50	MFW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A

Test Name: 981NRCRO.TST
Test Date: Thursday, June 10, 1999

Question ID				Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	51	AFW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	52	SD-038	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	53	WD	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	54	RMS	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	55	SD	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	56	SD	018	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	57	AOP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	58	OMM	005	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	59	AOP	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	GP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	61	EPP	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	62	SD	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	63	SD	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	64	OP	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	65	SD	009	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	66	SD	010	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	67	ITS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	68	SD	011	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	69	SD	012	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	70	EPP	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	71	ITS	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	72	AOP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	73	SD	014	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	74	SD	015	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	75	SD	016	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	76	EPP	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	77	EDG	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	78	SD	017	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	79	SD	013	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	80	SD	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	81	SD	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	82	EPP	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	83	SD	004	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	84	SD	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	85	SD	006	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	86	AOP	004	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	87	PATH 1	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	88	OMM	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	89	OMM	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	90	OMM	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	91	GP	003	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	92	GP	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	93	PROC	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	94	ITS	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	95	10CFR20	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	96	OP	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	97	GP	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	98	FRP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	99	EPP	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	100	FRP	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A

QUALITY TRAINING SUPPORTING WORLD CLASS PERFORMANCE

H.B. ROBINSON
NUCLEAR
TRAINING

1999 NRC SRO EXAMINATION

SUBMITTED BY:	DATE	PRINT YOUR NAME	DATE
APPROVED BY:	DATE	GRADE	DATE
		GRADED BY	DATE

I have neither received nor given any help during this exam

SIGNATURE

I have reviewed the graded examination and have had the opportunity to ask questions about any missed questions

SIGNATURE / DATE

1. Given the following plant conditions:

- Mode 2
- A reactor startup is in progress IAW GP-003
- Reactor is critical, power levels are:
  - N31- 62,000 cps
  - N32- 56,000 cps
  - N35- $9x10^{-11}$ amps
  - N36- $1x10^{-10}$ amps
- The RO withdraws rods 2 steps to get N35 to $1x10^{-10}$ amps
- When the RO releases the Rod Control switch, the rods continue to step out
- Power levels are now:
  - N31- 100,000 cps
  - N32- 92,000 cps
  - N35- $1.1x10^{-10}$ amps
  - N36- $1.2x10^{-10}$ amps

Which ONE (1) of the following describes the correct action(s) to take?

A. Manually trip the reactor.

B. Go to IN on the Rod Control switch in an attempt to stop rod motion.

C. Select AUTO on the Rod Bank Selector switch in an attempt to stop rod motion.

D. Verify both P-6 lights illuminated and block depress both SR High Trip block buttons.

2. Given the following conditions:

- Mode 1 at 100% RTP
- A rod dropped to the bottom of the core

Using the attached data, which ONE (1) of the following describes the core location for the dropped rod **and** the effect on the plant?

A. E11; there is a demand for rod withdrawal.

B. E11; there is a demand for rod insertion.

C. L05; there is a demand for rod withdrawal.

D. L05; there is a demand for rod insertion.

3. Given the following plant conditions:

- Control Rod H-8 from Control Bank "D" (CBD) has dropped into the core
- A runback has occurred and the operators have stabilized the plant at 67% RTP
- CBD @188 steps
- The operators are preparing to recover rod H-8

Which ONE (1) of the following describes the operability of Control Rod H-8 at this time?

The rod is considered:

A. operable because it can be moved by it's mechanism.

B. operable because it is providing the assumed reactivity that would be available upon a reactor trip.

C. inoperable because it is not trippable.

D. inoperable because it is more than 7.5 inches out of alignment with it's bank.

4. Given the following plant conditions:

- The plant has experienced a LBLOCA
- The crew is implementing Path 1
- Safeguards systems are operating as designed
- RCS Pressure is 22 psig
- The STA has reset SPDS and begun monitoring CSFST's
- There is a valid ORANGE path for RCS Integrity

Which ONE (1) of the following describes the correct crew response to these conditions?

Transition to:

A. FRP-P.2, RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK, and complete the entire procedure.

B. FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, and complete the entire procedure.

C. FRP-P.2, RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK, and complete the steps up to checking the status of RHR flow and RCS pressure, then reset SPDS and return to Path 1.

D. FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, and complete the steps up to checking the status of RHR flow and RCS pressure, then reset SPDS and return to Path 1.

5. Given the following plant conditions:

- Shutdown following a reactor trip and safety injection due to a failed S/G Safety valve
- The crew has transitioned to EPP-7, SI TERMINATION, from Path 1
- The following have been reset:
    - SI
    - Containment Isolation Phase A and Phase B
    - Feedwater Isolation
- Charging flow is 40 gpm
- All SI and RHR pumps have been stopped
- RCS subcooling is 52°F
- Pressurizer level is 10% and rapidly decreasing due to overfeeding S/G's

Which ONE (1) of the following describes the correct actions to be taken by the crew for these conditions?

A. Increase charging flow to increase Pressurizer level and continue in EPP-7.

B. Secure feeding S/G's until Pressurizer level recovers and continue in EPP-7.

C. Start both SI pumps and go to Path 1, Entry Point "C".

D. Manually initiate SI and go to Path 1, Entry Point "A".

6. Given the following plant conditions:

- Mode 1 at 30% RTP
- The following annunciators are illuminated
  - APP-001-D2, RCP#1 SEAL LEAKOFF HI FLOW
  - APP-001-B2, RCP LABYRINTH SEAL LO ΔP
- The RO reports that Seal Leakoff Flows are:
  - "A" = 1.2 gpm , steady
  - "B" = 1.3 gpm, steady
  - "C" = 5.0 gpm, increasing very slowly
- You enter AOP-018, RCP MALFUNCTIONS
- The STA reports that "C" RCP #1 Seal temperature is 198°F and very slowly increasing
- The BOP reports that "C" RCP Shaft vibration is 3 mils higher than "A" or "B" RCP but appears to be steady
- The Inside AO reports all Seal Injection flows appear to be normal

Which ONE (1) of the following describes the correct crew response to these conditions?

A. IAW AOP-018, trip the reactor, trip "C" RCP, go to Path 1, and continue with AOP-018.

B. Trip "C" RCP, commence plant shutdown IAW GP-006, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN, continue with AOP-018.

C. Notify Engineering of RCP Seal conditions and instruct them to contact Westinghouse for further instructions. If RCP "C" parameters deteriorate to RCP trip criteria, trip the reactor, trip "C" RCP, go to Path 1, and continue with AOP-018.

D. Notify Engineering of RCP Seal conditions and instruct them to contact Westinghouse for further instructions. If RCP "C" Seal Leakoff goes offscale high, then trip the reactor, trip "C" RCP, go to Path 1, and continue with AOP-018.

7. Given the following plant conditions:

- Crew has transitioned from EPP-004, REACTOR TRIP RESPONSE to EPP-005, NATURAL CIRCULATION COOLDOWN
- Operator has energized 150kw of PZR heaters

Which ONE (1) of the following describes the reason for energizing PZR heaters?

A. Minimize head voiding during the cooldown.

B. Minimize the potential of inadvertent dilution when borating.

C. Increase subcooling so cooldown rate can be increased to 25°F per hour.

D. Increase subcooling so cooldown rate can be increased to 100°F per hour.

8. Given the following plant conditions:

- Crew is performing EPP-006, NATURAL CIRCULATION COOLDOWN WITH A VOID IN THE VESSEL
- Operator been directed to control PZR level >20% and < 90%

Which ONE (1) of the following correctly describes the response of the RCS if letdown is greater than charging?

PZR pressure will:

A. decrease. This will cause PZR level to decrease due to the change in void size.

B. decrease. This will cause PZR level to increase due to the change in void size.

C. increase. This will cause PZR level to increase due to the change in void size.

D. increase. This will cause PZR level to decrease due to the change in void size.

9. Given the following conditions:

- Core Burnup = 16,800 MWd/MTU
- MODE 3, normal operating pressure and temperature
- RCS C_B = 320 ppm
- GP-007, Plant Cooldown from Hot Shutdown To Cold Shutdown is in progress in preparation for a refueling outage

Using the exerpts from the Station Curve Book (PROVIDED), which ONE (1) of the following provides the approximate amount of Boric Acid required to allow RCS cooldown to 150°F while maintaining 4% Shutdown Margin.

A. 648 gal

B. 968 gal

C. 1000 gal

D. 1500 gal

10. Given the following plant conditions:

- You are in FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
- You have progressed through the procedure with success except you are unable to borate
- Toward the end of the procedure you are directed to "Check Reactor Subcritical"
- Intermediate range SUR indications do not support a subcritical condition
- The RNO directs you to:
    - Allow the RCS to heat up
    - Perform actions of other FRP's as required by CSFST's
- SPDS shows:
    - RED on Subcriticality
    - ORANGE on Core Cooling
    - RED on Heat Sink
    - YELLOW on RCS Integrity
    - ORANGE on Containment
    - YELLOW on RCS Inventory

Which ONE (1) of the following states the allowable other FRP actions that can be implemented based on these plant condition?

A. Soak the RCS in FRP-P.2.

B. Establish Injection flow in FRP-C.2.

C. Restore AFW flow in FRP-H.1.

D. Establish Containment Spray in FRP-J.1.

11. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS Subcooling is +165°F
- RCS Pressure is 1720 psig and decreasing
- S/G "A" level is 4% (NR), pressure is 300 psig
- S/G "B" level is 8% (NR), pressure is 320 psig
- S/G "C" level is 0% (NR), 45% (WR), pressure is 150 psig
- CV pressure is 16 psig
- All automatic features have actuated properly

Which ONE (1) of the following contains a correct diagnosis **and** action based on the above indications?

A. Feed header rupture outside of containment, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

B. Only "C" S/G faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

C. All S/G's faulted, transition from Path 1 to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

D. All S/G's faulted, transition from Path 1 to EPP-11, FAULTED S/G ISOLATION.

12. Given the following plant conditions:

- Shutdown following a reactor trip, in Path 1
- RCS pressure is 1950 psig
- Pressurizer level is 23%
- RCS temperature is 486°F
- RV1-1, Steam Line PORV for S/G "A" is partially OPEN and cannot be shut
- S/G "A" level is 25% WR, pressure is 400 psig and both are decreasing
- S/G "B" and "C" levels are 22% NR and stable

Which ONE (1) of the following contains the expected pressure in S/G's "B" and "C" based on the above indications?

A. 400 psig

B. 585 psig

C. 600 psig

D. 615 psig

13. Given the following plant conditions:

- The Unit is shutdown following a reactor trip
- The path directs you to EPP-11, FAULTED STEAM GENERATOR ISOLATION
- You discover that your copy of EPP-11 is missing
- Upon investigation, all of the copies of EPP-11 in the Control Room are all missing

Which ONE (1) of the following describes the correct process for obtaining the current revision of EPP-11?

A. Refer to the "Ref Only" file in the POM directory on the LAN.

B. Refer to the the revision status on NRCS.

C. Reference the copy in the simulator for the correct revision number.

D. Contact document services to verify the current revision.

14. Given the following plant conditions:

- The plant has experienced a SBLOCA
- RCP's have been stopped IAW FOLDOUT "A" criteria
- Containment pressure is 8 psig
- The crew is in FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, due to a CSFST RED path
- SI cannot be terminated because of the present subcooling condition

Which ONE (1) of the following states the minimum subcooling required to re-start an RCP **and** what is the basis for starting an RCP in the above condition?

A. 35°F; provides core cooling.

B. 55°F; provides core cooling.

C. 35°F; provides mixing of warm RCS and cold SI water.

D. 55°F; provides mixing of warm RCS and cold SI water.

15. Given the following plant condition:

- Station Battery "A" has a capacity of 1070 amp-hours
- Station Battery "B" has a capacity of 340 amp-hours
- Each is sized to be able to carry expected shutdown loads during a design basis accident for a specified period of time without a battery charrger

Which ONE (1) of the following states the specified period of time for discharge **and** which battery has the higher discharge rate.

A. Both one hour; A has the highest discharge rate.

B. Both one hour, B has the highest discharge rate.

C. B one hour, A three hours, A has the highest discharge rate.

D. A one hour, B three hours, B has the highest discharge rate.

16. Which ONE (1) of the following describes the basis for the length of time for which Station Battery capacity is designed?

To ensure that sufficient required power is available to shutdown the reactor:

A. and maintain it in a safe condition after a DBA.

B. or maintain it in a safe condition after a DBA.

C. and allow adequate time to align power from emergency backfeed.

D. or allow adequate time to align power from emergency backfeed.

17. Given the following plant conditions:

- The Unit has experienced a Station Blackout
- The crew is implementing EPP-1, LOSS OF ALL AC POWER
- The Secondary Control Panel Operator has been directed to dump steam from all intact S/G's at the maximum rate to 240 psig

Which ONE (1) of the following describes the correct crew response for a return to criticality **and** at what time in core life would a return to criticality be more likely?

A. Verify that SI accumulators have been injected into the RCS. BOL.

B. Verify that SI accumulators have been injected into the RCS. EOL.

C. Reduce rate of dumping steam and allow RCS to heatup. BOL.

D. Reduce rate of dumping steam and allow RCS to heatup. EOL.

18. Given the following plant conditions:

- Mode 1 at 100% RTP
- A turbine runback occurs
- All windows on Bistable Status Panel "A" are extinguished

Which ONE (1) of the following would provide the above indications if all systems functioned as designed?

A. Loss of "B" battery

B. Loss of "A" battery

C. Loss of Instrument Bus 3

D. Loss of Instrument Bus 1

19. Which ONE (1) of the following states a correct limitation for TI-607, CCW Supply Header Temperature, if RCS temperature is <350°F?

A. Less than 125°F to the SI pumps.

B. Less than 105°F to all components.

C. Less than 125°F to the Excess Letdown Heat Exchanger.

D. Less than 105°F to the Excess Letdown Heat Exchanger.

20. Given the following conditions:

- Mode 1 at 100% RTP
- The CVCS Holdup Tank Room is a Locked High Radiation Area due to a 15 R/hr hotspot on the east side of the "A" Hold-Up Tank
- The on-shift Radiation Control technician is in Containment supporting an entry
- A fire is reported in the CVCS Hold-Up Tank Room

Which ONE (1) of the following describes a condition which will allow fire brigade entry into the CVCS Holdup Tank Room?

A. Entry can only be made if all fire brigade members have an emergency dosimeter and a survey instrument.

B. Entry can be made if at least one fire brigade member has an emergency dosimeter and a survey instrument.

C. Entry can be made if at least one licensed operator with a survey meter accompanies the fire brigade.

D. Entry can only be made if a Radiation Control technician, qualified as a fire brigade member, accompanies the fire brigade.

21. Given the following plant conditions:

- Mode 5 due to a forced outage
- CV Integrity is being maintained at the direction of Station management
- Plant heat-up and Mode 4 entry is scheduled for 12 hours from now
- Several CV entries have been made

Which ONE (1) of the following describes the surveillance requirements that must be satisfied for CV Integrity?

OST-014, LLRT (Local Leak Rate Test) OF PERSONNEL AIR LOCK DOOR SEALS, shall be performed:

A. within 3 days of the initial entrance to the CV.

B. within 3 days of the final entrance to the CV.

C. prior to RCS temperature exceeding 200°F.

D. upon RCS temperature reaching 200°F.

22. Given the following plant conditions:

- RCS temperature is 225°F with a plant heatup in progress
- At 1200, while exiting Containment (CV), a group of personnel were unable to close the inner air lock door
- At 1215, the air lock interlock was defeated and the outer door opened and then closed
- At 1245, while entering the airlock to repair the inner door, the outer door malfunctioned and would not seal properly
- It is now 1250

Which ONE (1) of the following describes the correct action to be taken IAW ITS 3.6.2? (ATTACHED)

A. Close door by 1300 today and lock by 1300 tomorrow.

B. Close a door by 1315 today and lock by 1315 tomorrow.

C. Commence evaluation of overall CV leakage per LCO 3.6.1.

D. Commence plant cooldown to 200 degrees.

23. Given the following plant conditions:

- The plant has experienced a SBLOCA
- Safety systems have not functioned as designed
- Containment pressure is 4.2 psig
- RCS pressure is 1885 psig
- RCS subcooling is +2°F
- RVLIS Full range is 40 %
- All S/G pressures are 1030 psig
- Total AFW flow is 325 gpm
- S/G NR levels are:
    - A = 15%
    - B = 15%
    - C = 17%

Which ONE (1) of the following states the correct procedure to enter for these conditions?

A. FRP-H.2, RESPONSE TO STEAM GENERATOR OVERPRESSURE.

B. FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.

C. FRP-C.1, RESPONSE TO INADEQUATE CORE COOLING.

D. FRP-C.2, RESPONSE TO DEGRADED CORE COOLING.

24. Given the following plant conditions:

- Mode 1 at 100% RTP
- An increasing trend on RCS activity is being investigated by Chemistry personnel:
  I-131, 133
  Cs-134, 137, 138
- The IAO reports "A" Seal Injection Filter is reading 2.6 psid
- The on-shift RC technician reports "A" Seal Injection Filter is reading 26 Rem/hour

Which ONE (1) of the following describes the correct actions to be taken regarding the "A" Seal Injection Filter?

A. Monitor Filter D/P and radiation level once per shift, shift filter when D/P exceeds 3 psid.

B. Monitor Filter D/P and radiation level once per shift, shift filter when D/P exceeds 5 psid.

C. Shift to the "B" Filter in service, change out "A" filter due to exceeding 25 Rem/hour.

D. Shift to the "B" Filter in service, change out "A" filter due to approaching 3 psid.

25. Given the following plant conditions:

- Mode 1 at 9% RTP
- The main generator has been synchronized with the grid, breakers 52/8 & 52/9 (North and South OCB's) are closed
- The dedicated feedwater operator announces that he/she has lost control of S/G levels and recommends a reactor trip
- All three (3) S/G levels are approaching the low level trip setpoint
- The Reactor Operator trips the reactor
- The turbine does not trip

Which ONE (1) of the following describes the correct turbine **and** crew response to this situation?

A. Turbine does **NOT** trip automatically because the reactor power was less than 10%. Crew should manually trip the turbine.

B. Turbine does **NOT** trip automatically due to the reactor trip but should have tripped because of the low S/G levels. Crew should manually trip the turbine.

C. Turbine should have automatically tripped. Crew should manually trip the turbine.

D. Turbine should have automatically tripped. Crew should manually run the turbine back to zero on the setter.

26. Given the following plant conditions:

- GP-007, PLANT COOLDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN, in progress
- Pressurizer PORV Overpressure selector switches have just been placed in OVERPRESSURE

Which ONE (1) of the following correctly interprets the logic required to Pressurizer PORV PCV-456?

The PORV would open if the auctioneered ______ RCS wide range temperature via a function generator, generates a signal that is _________than the pressure sensed by RCS pressure transmitter _______.

A. low; greater; PT-500.

B. low; less; PT-500.

C. high; greater; PT-445.

D. high; less; PT-445.

27. Using the attached parameter plots, which ONE (1) of the following describes the current RCS status?

A. PZR Steam space leak.

B. Leaking spray valve.

C. PZR reference leg leak

D. Leak from high pressure sensing line of LT-459

28. Given the following plant conditions:

- A reactor trip and SI has occurred
- Crew has responded IAW the EOP network
- Crew has entered EPP-009, TRANSFER TO COLD LEG RECIRCULATION due to low RWST level
- Shortly after entering EPP-009, the crew transitions to EPP-015, "LOSS OF EMERGENCY COOLANT RECIRCULATION"

Which ONE (1) of the following states conditions which would warrant this transition to EPP-015?

A. < 354 inches in the CV Sump **AND** no flow path from the CV Sump to the RCS.

B. < 354 inches in the CV Sump **OR** no flow path from the CV Sump to the RCS.

C. < 9% level in the RWST **OR** no flow path from the CV Sump to the RCS.

D. < 9% level in the RWST **AND** no flow path from the CV Sump to the RCS.

29. Given the following plant conditions:

- Mode 1 at 100% RTP
- Two letdown orifices are in service; CVC-200A, 45 GPM ORIFICE ISOLATION, and CVC-200B, 60 GPM ORIFICE ISOLATION
- Pressurizer level is on program
- "A" charging pump is running in automatic
- "B" charging pump is in manual (45 gpm flow through the pump)
- All Seal Injection flows are 8 gpm each
- All Seal Return flows are 3 gpm each

Which ONE (1) of the following describes a correct plant response to a loss of electrical power to CVC-200A with **no operator action**?

If LC-459G, Pressurizer Level controller, is in:

A. automatic, the reactor will trip as a result of CVC-200A closing.

B. manual, the reactor will trip as a result of CVC-200A closing.

C. automatic, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

D. manual, LCV-115B, EMERGENCY MAKEUP TO CHARGING SUCTION, will open.

30. Given the following plant conditions:

- Mode 4, proceeding to Mode 5
- RCS temperature is 210°F
- A large leak in the Component Cooling Water (CCW) system has developed
- AOP-014, COMPONENT COOLING WATER MALFUNCTION, has been entered
- The CCW pumps have been locked out

Which ONE (1) of the following describes the correct actions to be taken by the crew?

A. Exit AOP-014, Enter AOP-020.

B. Go to AOP-020, LOSS OF RHR, stop all RHR pumps.

C. Continue in AOP-014 until the leak has been isolated, then evaluate recovery actions.

D. Stop all RHR pumps and go to AOP-020, LOSS OF RHR, while continuing with AOP-014.

31. Given the following plant conditions:

- Mode 1 at 100% RTP
- A malfunction occurs in the Pressurizer Pressure controller
- RCS pressure increases to 2300 psig

Which ONE (1) of the following describes an effect on the plant as a result of the controller malfunction?

A. VCT level decreases.

B. Seal return flow increases.

C. Seal injection flow decreases.

D. Charging flow on FI-122 decreases.

32. Given the following plant conditions:

- A plant startup is in progress IAW GP-005, POWER OPERATION
- The unit is at 50% RTP

Using Attachment 6.1 (PROVIDED), which ONE (1) of the following describes the point in the attachment when the Manager - Operations was required to be notified **and** why?

A. Row A; greater than 2% difference between N35 and N44.

B. Row B; greater than 2% difference between PI-446 (Turbine 1st Stage Steam Pressure) and N42.

C. Row C; greater than 5% difference between N41 and N44.

D. Row D; greater than 5% difference between PI-446 (Turbine 1st Stage Steam Pressure) and N42.

33. Given the following plant conditions:

- Mode 1 at 100% RTP
- AOP-035, STEAM GENERATOR TUBE LEAK, has been entered due to a tube leak in "B" S/G
- The crew has commenced a normal plant shutdown IAW GP-006, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN

Which ONE (1) of the following describes the proper use of AOP-035 during the shutdown?

A. Performed in parallel with plant shutdown but would require use of GP-006 Attachment 6.1, RAPID SHUTDOWN.

B. Performed in parallel with plant shutdown. Exited if leak rate exceeds charging capacity.

C. Exited once plant shutdown commences. Only use if leak rate exceeds charging capacity.

D. Used at the discretion of the CRSS as "Information Use".

34. Given the following plant conditions:

- The crew is responding to multiple accident conditions
- S/G "C" is ruptured
- Path 2 has been entered and preparations are being made for dumping steam at the maximum rate from the intact S/G's
- Containment Pressure is 3.0 psig after peaking at 4.7 psig
- RCS Tcold is 492°F
- "C" S/G prssure is 250 psig above non-ruptured S/G pressure

Which ONE (1) of the following describes the required core exit temperature? Use the Attached table to make your determination.

A. 415°F

B. 435°F

C. 445°F

D. 465°F

35. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" condensate pump trips

Which ONE (1) of the following describes the **initial** feedwater system response to the above condition with **no operator action**?

All S/G feedwater regulating valves will:

A. close and both main feedwater pumps will trip.

B. close and only "A" main feedwater pump will trip.

C. open and only "A" main feedwater pump will trip.

D. open and both main feedwater pumps will trip.

36. Given the following plant conditions:

- A reactor trip and SI have occurred
- AFW flow < 300 gpm
- S/G WR levels are : "A"= 24%, "B"= 25%, "C" = 27%
- RCP's are secured
- RCS pressure is 2285 psig and increasing
- Crew initiates RCS bleed and feed

Which ONE (1) of the following describes the plant parameter/setpoint that directed the initiation of bleed and feed **and** the basis for it?

A. RCS pressure greater than 2280 psig; PZR PORV capability.

B. RCS pressure greater than 2280 psig; indication of imminent PORV lift.

C. 2 S/G WR levels less than 26%; PZR PORV capability.

D. 2 S/G WR levels less than 26%; indication of imminent S/G dryout.

37. Given the following plant conditions:

- Mode 1 at 100% RTP
- APP-036-D1, BATTERY CHARGER A/A-1 TROUBLE, is illuminated
- The AO reports that "A" Battery Charger has tripped and that there is an acrid odor in its vicinity

Using ITS 3.8.4 (PROVIDED), which ONE (1) of the following describes the correct crew response to this situation?

A. Implement action statements of LCO 3.8.4 and place Battery Charger A-1 in service within 2 hours.

B. Implement action statements of LCO 3.8.4 and place Battery Charger A-1 in service within 2 hours, **and** be in Mode 3 within 6 hours.

C. Initiate a Priority 1 Work Request and inform Maintenance that they have 2 hours to repair Battery Charger "A". Entry into LCO 3.8.4 is not required if repairs completed within 2 hours.

D. Initiate a Priority E Work Request and inform Maintenance that they have 2 hours to repair Battery Charger "A". Entry into LCO 3.8.4 is not required if repairs completed within 2 hours.

38. Given the following plant conditions:

- Waste Gas Decay Tank (WGDT) "A" is the IN SERVICE tank and has an identified leak
- Waste Gas Decay Tank "B" is in STANDBY and will be placed IN SERVICE per AOP-009, ACCIDENTAL GAS RELEASE FROM A WGDT

Which ONE (1) of the following correctly describes the basis for placing Waste Gas Decay Tank "B" IN SERVICE instead of Waste Gas Decay Tanks "C" or "D" under these conditions?

A. All actions can be performed from the Waste Disposal Boron Recycle Panel. The operator does not have to enter the WGDT Valve Gallery which may be a high airborne area.

B. Most actions can be performed from the Waste Disposal Boron Recycle Panel. The operator has to spend limited time in the WGDT Valve Gallery which may be a high airborne area.

C. All actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

D. Most actions can be performed from the Waste Disposal Boron Recycle Panel. This saves time and terminates the release faster.

39. Which ONE (1) of the following lists the RMS channels designed to provide indication during and after an accident when radiation levels and/or environmental specifications of the other channels may be exceeded?

    1. R-1, Control Room
    2. R-2, CV Low Range Monitor
    3. R-11, CV Air or Plant Stack, Particulate
    4. R-12, CV Air or Plant Stack, Noble Gas
    5. R-14C, Plant Stack, Noble Gas, Low Range
    6. R-14D, Plant Stack, Noble Gas, Intermediate or Mid Range
    7. R-14E, Plant Stack, Noble Gas, High Range
    8. R-30, Fuel Handling Building, Lower Level, High Range Noble Gas
    9. R-31A, B, C Main Steam Lines
    10. R-32A, B CV High Range

A. 3, 4, 6, 7, 9, 10

B. 1, 5, 6, 8, 9, 10

C. 2, 6, 7, 9, 10

D. 6, 7, 8, 9, 10

40. Given the following plant conditions:

- Mode 1 at 100% RTP
- APP-001-E7,INST AIR COMP D TRIP, illuminates
- APP-001-F7, INST AIR HDR LO PRESS, illuminates
- The RO reports Instrument Air header pressure is 83 psig and decreasing
- AOP-017, LOSS OF INSTRUMENT AIR, is entered, and the transition made to Section A, POWER OPERATION
- The BOP announces that "C" FRV is slowly drifting in the CLOSED direction

Which ONE (1) of the following describes the correct crew response to these conditions?

A. Go to the main body of AOP-017 to determine the need to cross-connect Station Air and Instrument Air. Decrease turbine loading as necessary to maintain feed and stem flows matched.

B. Continue in Section A. Cross-connect Station Air and Instrument Air to regain control of "C" FRV.

C. Trip the reactor and go to Path 1 while continuing with Section A of AOP-017.

D. Trip the reactor and go to Path 1, continue with AOP-017 but now go to Section B, HOT SHUTDOWN.

41. Given the following plant conditions:

- Mode 1 at 100% RTP
- LT 459, Pressurizer Level Transmitter, has failed low
- Crew enters AOP-025, "RTGB INSTRUMENT FAILURE"
- An operable level channel is selected and APP-003-C3, PRT HI PRESS, is received

CVC-460 A&B, LETDOWN ISOLATION STOPS
CVC-203A, LETDOWN RELIEF
CVC-209, LP LETDOWN RELIEF

Which ONE (1) of the following describes the cause of the PRT alarm?

A. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-203A lifted.

B. CVC-460 A&B control switch was not placed in CLOSE prior to selecting an operable controlling channel. CVC-209 lifted.

C. Letdown isolation caused CVC-209 to lift.

D. Letdown isolation caused CVC-203A to lift.

42. Given the following plant conditions:

- The plant was operating at 100% RTP
- All systems are in their normal configuration
- A Loss of Off-Site Power occurred and EPP-001, LOSS OF ALL AC POWER, was entered
- The EDG's have been started from the RTGB and the output breakers closed
- Service Water pumps have been started by the blackout sequencer
- An SI occurs immediately after SW pumps started

Which ONE (1) of the following best describes the Safeguards Sequencer response to this event?

The Blackout sequencer will:

A. continue to completion, any additional equipment will be started by the SI sequencer.

B. continue to completion, any additional equipment will require a manual start.

C. stop, all loads will be stripped and restarted by the SI sequencer.

D. stop, the SI sequencer will start the required additional loads.

43. Given the following plant conditions:

- FRP-H.2, RESPONSE TO S/G OVERPRESSURE, is in effect
- STA is monitoring CSFST's
- The crew is monitoring the affected S/G level as directed by procedure

Which ONE (1) of the following correctly describes the importance for monitoring level?

If S/G level :

A. is > 90%, then transition to FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, is required.

B. is > 90%, the S/G water level may be above the narrow range or the the S/G may be in a water solid condition.

C. remains < 90%, then the crew is assured that a SGTR is not occurring.

D. remains < 90%, then the steam dumps have been operating successfully.

44. Given the following plant conditions:

- Mode 1 at 60% RTP
- The rods are selected to MANUAL
- Control rod (M-6) drops to the bottom of the core

Which ONE (1) of the following describes the **initial** integrated plant response to the rod drop and the reason for the response? **(Assume no operator action)**

A. APP-003-F3, CHG PMP LO SPEED, illuminates due to the reactivity inserted by the dropped rod.

B. APP-003-F3, CHG PMP LO SPEED, illuminates due to mismatch between reactor power and steam demand.

C. APP-003-F4, CHG PMP HI SPEED, illuminates due to mismatch between reactor power and steam demand.

D. APP-003-F4, CHG PMP HI SPEED, illuminates due to the reactivity inserted by the dropped rod.

45. Given the following plant conditions:

- Mode 1 at 95% RTP
- A flux tilt of 1.038 exists
- Rod K-14 appears to be misaligned
- This condition cannot be corrected for at least 2.5 hours

Using ITS 3.2.4 (ATTACHED), which ONE (1) of the following correctly describes the correct power reduction **and** time frame to accomplish this power reduction?

Reduce core power to:

A. 88.6% within 1 hour.

B. 83.6% within 1 hour.

C. 88.6% within 2 hours.

D. 83.6% within 2 hours.

46. Given the following plant conditions:

- Mode 1 at 35% RTP
- Two charging pumps are running
- The following RCP indications are observed:

	RCP "A"	RCP "B"	RCP "C"
o RCP motor bearing temperatures	180°F	180°F	210°F
o #1 seal leakoff temperatures	150°F	150°F	165°F
o Thermal barrier delta P	10"	10"	8"

Which ONE (1) of the following describes the action(s) required for this condition?

A. Stop "C" RCP, shutdown IAW GP-006, Normal Plant Shutdown From Power Operation To Hot Shutdown, and be in Mode 3 within 6 hours.

B. Throttle CVC-297C, "C" RCP Seal Water Flow Control valve, to obtain between 8 and 13 gpm flow to each "C" RCP Seals.

C. Close CVC-303C, "C" RCP Seal Leakoff valve.

D. Trip the reactor, stop RCP "C".

47. Given the following plant conditions:

- Plant has experienced a loss of off-site power
- Reactor trip & turbine trip have been verified
- Crew entered EPP-001, LOSS OF ALL AC POWER, until the inside AO restored power to E-2 per Attachment 6 of EPP-001.
- Crew has returned to Path-1
- No SI has occurred or is required

Which ONE (1) of the following correctly describes how "Verify two charging pumps running" of PATH-1 will be completed?

Operator will start ___ charging pump from the "B" EDG and then ____charging pump from the DS bus after energizing it from the DS EDG per EPP-025, ENERGIZING SUPPLEMENTAL PLANT EQUIPMENT USING THE DSDG

A. "B" ; "A"

B. "C" ; "B"

C. "B" ; "C"

D. "C" ; "A"

48. Given the following plant conditions:

- The RCS is on RHR and solid
- RCS pressure is 350 psig
- RCS temperature is stable
- HIC-142, LETDOWN, controller setting is at 40% demand
- PC-145, PRESSURE, is in AUTO
- The Reactor operator adjusts HIC-142 controller to 80% demand

Which ONE (1) of the following statements is correct?

A. Letdown pressure increases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure decreases.

B. Letdown pressure increases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure decreases.

C. Letdown pressure decreases, PCV-145 automatically throttles shut to restore letdown pressure to its original value, and RCS pressure increases.

D. Letdown pressure decreases, PCV-145 automatically throttles open to restore letdown pressure to its original value, and RCS pressure increases.

49. Given the following plant conditions:

- A DBA LOCA has occurred
- An electrical fault results in a loss of E-1

Which ONE (1) of the following describes the effects of the loss of E-1 on containment conditions?

A. Adequate equipment is operating to provide the required cooling for containment in this event.

B. With the start of an additional SW booster pump, adequate equipment is operating to maintain containment conditions within design limits.

C. With the start of an additional CV spray pump, adequate equipment is operating to maintain containment conditions within design limits.

D. With the start of an additional HVH unit, adequate equipment is operating to maintain containment conditions within design limits.

50. Given the following plant conditions:

- Reactor trip and SI have occurred
- Failure of SI status lights has occurred
- CRSS has directed the RO to verify the CVCS related SI valves CLOSED using RTGB indication

Which ONE (1) of the following correctly describes the CVCS valves required to be verified closed?

A. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Line Isol valves (CVC-204A & 204B)

B. Letdown Line Isol valves (CVC-204A & 204B) and Letdown Stop valves (CVC-460A & 460B)

C. Letdown Orifice Isol valves (CVC-200A, 200B, & 200C) and Letdown Stop valves (CVC-460A & 460B)

D. Letdown Line Isol valves (CVC-204A & 204B) and Seal Water Return Isol valve (CVC-381)

51. Given the following plant conditions;

- Mode 1 at 100% RTP
- All control systems are in automatic

Assuming no operator action, which ONE (1) of the following describes the response of the rod control system if Power Range Nuclear Instrument Channel N-44 fails full upscale?

A. No rod movement will occur because of the Overpower rod stop from N-44 failure.

B. Nuclear power - Turbine power mismatch signal steps rods in until the signal decays, then rod motion stops.

C. Nuclear power - Turbine power mismatch signal steps rods in until the Tavg-Tref mismatch signal overrides it.

D. Nuclear power - Turbine power mismatch signal steps rods in as long as N-44 is energized.

52. Given the following plant conditions:

- The plant was initially at 95% RTP and increasing following a refueling outage
- The reactor has tripped
- Compensating voltage on N-35, Intermediate Range NI, is set too high

Which ONE (1) of the following describes the response of Intermediate Range N-35 to the improperly set compensating voltage?

A. Indicates LOW; causing P-6 to energize the Source Range instruments prematurely.

B. Indicates HIGH; preventing P-6 from automatically energizing the Source Range instruments.

C. Indicates HIGH; the Source Range instruments will be energized by P-6 from the other IR channel (N-36).

D. Indicates LOW; the Source Range instruments will be energized when P-6 is satisfied by the other IR channel (N-36).

53. Given the following plant conditions:

- Mode 1 at 100% RTP
- An NAS Assessment identifies that the feedwater temperature indicators are inaccurate
- It is determined that the feedwater temperature detectors shows an indicated temperature that is LOWER than ACTUAL
- These readings were used in OST-10, POWER RANGE CALORIMETRIC DURING POWER OPERATION DAILY
- The power range detectors were adjusted using the OST

Which ONE (1) of the following correctly describes the results of the feedwater error on the power range calorimetric?

Indicated power is _______than calculated power causing a _______conservative NI setting.

A. LOWER; MORE

B. HIGHER; MORE

C. LOWER; LESS

D. HIGHER; LESS

54. Given the following plant conditions:

- APP-036-01, CH A ICCM SYS MALF is illuminated

Which ONE(1) of the following describes the RVLIS component that could cause this alarm to actuate and what condition is it indicating?

A microswitch located in the:

A. Sensor Bellows; RCS leak.

B. Sensor Bellows; capillary line leak.

C. Hydraulic Isolator; RCS leak.

D. Hydraulic Isolator; capillary line leak.

55. Which ONE (1) of the following describes the difference between an automatic and a manual spray actuation?

    A. Containment Phase B Isolation and Containment Ventilation Isolation only occur on a manual actuation.

    B. Containment Phase B Isolation and Containment Ventilation Isolation only occur on an automatic actuation.

    C. Safety Injection and Steamline Isolation only occur on a manual actuation.

    D. Safety Injection and Steamline Isolation only occur on an automatic actuation.

56. Given the following plant conditions:

- Crew is in FRP-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL
- S/G levels are as follows:

	S/G "A"	S/G "B"	S/G "C"
◊ Wide range levels	27%	7%	29%

- AFW flowrate to each S/G is 70 gpm

Which ONE (1) of the following describes the allowed AFW flow rates to the S/G's?

Establish AFW flow:

A. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 80 gpm to S/G "B" until WR level is >9%.

B. as necessary to S/G's "A" and "C" until NR level is >10%; and less than or equal to 100 gpm to S/G "B" until WR level is >9%.

C. less than or equal to 80 gpm to each S/G until NR level is >10%.

D. less than or equal to 100 gpm to each S/G until NR level is >10%.

57. Given the following plant conditions:

- Mode 1 at 30% RTP
- A reactor trip occurs
- All systems operate as expected
- Tave = Tref.

Which ONE (1) of the following correctly describes the status of secondary plant components for the above conditions?

A. Feed regulating valves open, feed regulating bypass valves open.

B. Feed regulating valves open, feed regulating bypass valves closed.

C. Feed regulating valves closed, feed regulating bypass valves open.

D. Feed regulating valves closed, feed regulating bypass valves closed.

58. Given the following plant conditions:

- The plant has experienced a trip from 100% RTP

Upon initiation of AFW, which ONE (1) of the following correctly describes the automatic response of the AFW system to these conditions?

The normally:

A. closed MDAFW pump discharge flow control valves (FCV 1424 and 1425) fully open.

B. open SDAFW pump discharge flow control valve (FCV 6416) throttles closed.

C. closed SDAFW pump discharge flow control valve (FCV 6416) throttles open.

D. open MDAFW pump discharge flow control valves (FCV 1424 and 1425) throttle closed.

59. Given the following plant conditions:

- Mode 1 at 100% RTP
- A liquid release is in progress
- All systems are in a normal lineup and functioning properly

Which ONE (1) of the following identifies a Control Room indication that allows monitoring of the release?

A. Position of RCV-018, LIQUID WASTE EFFLUENT ISOLATION.

B. R-18, LIQUID WASTE DISPOSAL EFFLUENT.

C. YIC-1676, LIQUID RELEASE TOTALIZER.

D. FI-1064, RELEASE FLOW RATE.

60. Given the following plant conditions:

- Mode 3
- A release is in progress from "B" Waste Gas Decay Tank
- R-14C, PLANT STACK NOBLE GAS LOW RANGE, FAIL light illuminates

Which ONE (1) of the following conditions in the Control Room would also exist **and** what would be the effect of the above condition on RCV-014 (WASTE GAS RELEASE ISOLATION)?

A. APP-036-E7, RTGB RAD MONITOR TROUBLE; open.

B. APP-036-E7, RTGB RAD MONITOR TROUBLE; closed.

C. APP-036-D8, RTGB PROCESS MONITOR HI RAD; open.

D. APP-036-D8, RTGB PROCESS MONITOR HI RAD; closed.

61. Given the following plant conditions:

- Mode 1 at 100% RTP
- A release is in progress from Waste Gas Decay Tank "A"
- A loss of Instrument Bus 2 occurs

Which ONE (1) of the following describes the effect on the release based upon the instrument bus loss?

The release:

A. is automatically terminated due to loss of R-14 (PLANT VENT MONITOR).

B. must be manually terminated due to loss of R-14 (PLANT VENT MONITOR).

C. must be manually terminated due to loss power to the Waste Disposal Boron Recycle Panel.

D. is automatically terminated due to loss of power to the Waste Disposal Boron Recycle Panel.

62. Which ONE (1) of the following contains a correct association between a Radiation Monitor **and** the basis for its alarm setpoint?

A. R-14C, Plant Vent Lo Range Noble Gas; 10CF20 most restrictive dose rate of 1500 mr/yr to any organ.

B. R-14D, Plant Vent Mid Range Noble Gas; 50 mr/hr at site boundary for a release of 30 minutes duration.

C. R-30, Fuel Handling Building Lower Level Hi Range; 3000 mr/yr to the skin.

D. R-31A, B, C, Main Steam Line; one quarter of their range.

63. During a drain of the RCS IAW GP-008, DRAINING THE REACTOR COOLANT SYSTEM, the hoses connected to the Pressurizer Relief loop seal drains are required to be removed after the seals are drained.

Which ONE (1) of the following provides the correct reason for removing these hoses?

A. AP-010, Housekeeping Instructions. Hoses are a trip hazard and want to minimize the potential for falls inside Containment.

B. Radiactive material issue. Need the hoses for additional drains which minimizes the amount of radioactive hoses generated by not having seperate hoses for each drain evolution.

C. MMM-010, Cleanliness and Flushing. If end of hose became submerged, could siphon water from the floor drain into the RCS and introduce contaminants.

D. Vent path concern. Eliminates the potential for hose collapse which would prevent air draw.

64. Given the following plant conditions:

- Mode 1 at 100% RTP
- The following annunciators are illuminated:
  - APP-003-D8, PZR CONTROL HI/LO PRESS
  - APP-003-E8, PZR CONTROL HI/LO LVL
  - APP-003-F4, CHG PUMP HI SPEED
- You have just entered, AOP-016, Excessive RCS Leakage
- Pressurizer level is 28%
- RCS pressure is approaching 2000 psig

Which ONE (1) of the following describes the correct response for the above conditions?

A. Automatic trip due to OPΔT.

B. Manual reactor trip due to loss of subcooling.

C. Automatic reactor trip due to Lo Pressrurizer pressure.

D. Manual trip due to approaching Safety Injection setpoint.

65. Given the following plant conditions:

- Shutdown following a reactor trip
- APP-004-B2, PZR LO PRESS TRIP, is flashing
- RCS Pressure is 1825 psig
- Pressurizer level is 13% and decreasing at 2%/min
- RCS Temperature is 547°F
- "B" and "C" charging pumps are running
- You are in EPP-4, Post Trip Response

Which ONE (1) of the following describes the correct response upon opening Foldout "A"?

A. Start both Safety Injection pumps.

B. Verify Letdown isolated and start "A" charging pump.

C. Initiate Safety Injection.

D. Secure all RCP's.

66. Given the following plant conditions:

- Mode 1 at 100% RTP
- PC-444J fails high

Which ONE (1) of the following describes the correct plant response if **NO** operator actions are taken?

A. All pressurizer heaters energize as plant pressure decreases.

B. Pressurizer Spray valves shut and the PORV's cycle to control pressure.

C. A reactor trip and safety injection occur on low Pressurizer pressure.

D. An OPΔT trip occurs.

67. Given the following plant conditions:

- Mode 1 at 100% RTP
- The crew is making preparations to commence a normal shutdown. A boration is in progress
- As part of the preparations, an additional letdown orifice is being placed in service
- The operator misses the step to adjust charging flow to match the expected letdown flow

Which ONE (1) of the following describes a plant response/indication resulting from the missed step?

A. VCT level decreases.

B. Charging pump speed decreases.

C. APP-001-B6, LP LTDN LN HI TEMP, illuminated.

D. TCV-143, VCT/DEMINERALIZER DIVERSION, diverts to VCT.

68. Given the following plant conditions:

- Mode 1
- A normal plant shutdown IAW GP-006 is in progress
- NIS: N41 = 9%, N42 = 9%, N43 = 9%, N44 = 10%
- Turbine first stage pressure is 60 psig
- "B" RCP trips due to a breaker malfunction

Which ONE (1) of the following describes the plant condition?

The plant is:

A. greater than P-7. The reactor trips.

B. greater than P-7. The reactor does not trip.

C. less than P-7. The reactor trips.

D. less than P-7. The reactor does not trip.

69. Given the following plant conditions:

- The reactor is critical at the following power level:
  - N31 = 42,000 cps
  - N32 = 46,000 cps
  - N35 = $<1\text{x}10^{-11}$ amps
  - N36 = $8\text{x}10^{-11}$ amps
- APP-005-C2, IR DET LOSS OF VOLT, is illuminated

Using the provided copy of ITS 3.3.1, which ONE (1) of the following specifies the correct required action?

A. Increase power to >P-10 within 2 hours.

B. Restore N35 to service prior to going >P-6.

C. Verify P-6 2x2 is illuminated within one hour.

D. Restore N36 to service prior to going >P-6.

70. Given the following plant conditions:

- Mode 1 at 100% RTP
- The daytime temperature is 105°F, CV pressure reads 0.2 psig
- The predicted night time low is 55°F with a high pressure area.

Which ONE (1) of the following describes the expected response of CV pressure **and** applicable required actions?

A. Increase, no actions required.

B. Increase, open CV vacuum reief valves.

C. Decrease, open CV vacuum relief valves.

D. Decrease, verify CV vacuum valves open automatically.

71. Given the following plant conditions:

- Mode 1 at 100% RTP and have been on-line for 15 days after a refueling outage
- The outside air temperature is 105°F
- APP-036-B4, SPENT FUEL PIT TEMP HI/LO, is received
- SFP temperature is 122°F

Which ONE (1) of the following describes a possible cause for this alarm?

A. A leak in the SFP.

B. Making up to the SFP.

C. Removing the SFP filter from service.

D. Bypassing the SFP demineralizer.

72. Which ONE (1) of the following will cause the amount of natural circulation present to change?

A. A change in S/G level from 50% NR to 20% NR.

B. A change in S/G level from 75%WR to 40%WR.

C. Go from 45% Pressurizer level to 92% RVLIS Full Range.

D. Go from 70% RVLIS Full Range to 90% RVLIS Full Range.

73. Given the following plant conditions:

- RCS T-cold is 175°F, Pressure is 345 psig
- RHR is aligned for core cooling
- "A" RHR is running, "B" RHR is in standby
- "A" S/G is drained for maintenance
- "C" S/G is drained for maintenance
- It is desired to place "B" RHR pump out of service to conduct maintenance scheduled to take 6 hours

Which ONE (1) of the following describes the condition that must be satisfied in the "B" S/G in order to allow the RHR maintenance without entering an LCO?

Operable with:

A. level at least 10% (NR).

B. level at least 16% (NR).

C. temperature not >50°F higher than RCS T-cold.

D. temperature not >50°F lower than RCS T-cold.

74. Given the following plant conditions:

- Mode 1 at 85% RTP
- LCV-1530A, HDT LEVEL CONTROL VALVE, air supply piping develops a significant leak
- The AO is directed to isolate to LCV-1530A
- The AO inadvertently isolates air to LCV-1530B, HEATER DRAIN PUMPS SUCTION DUMP TO CONDENSER

Which ONE (1) of the following describes how these valves respond to the above plant conditions ?

A. LCV-1530A closes and LCV-1530B opens.

B. LCV-1530A position does not change and LCV-1530B position does not change.

C. LCV-1530A opens and LCV-1530B closes.

D. LCV-1530A position does not change and LCV-1530B opens.

75. Given the following plant conditions:

- Mode 1 at 100% RTP
- Vacuum pump "A" is running
- Vacuum pump "B" is selected to AUTO

Which ONE (1) of the following describes the correct operation of the vacuum pumps?

A. At 25.5 inches Hg decreasing, "B" automatically starts and at 27.0 inches Hg increasing, "B" automatically stops.

B. At 25.5 inches Hg decreasing, "B" automatically starts and "B" must be manually stopped and returned to AUTO.

C. All running pumps will shift to "hogging" mode at 25 inches Hg decreasing.

D. All running pumps will shift to "jetting" mode at 27 inches Hg increasing.

76. Given the following plant conditions:

- Mode 1 at 100% RTP
- Breaker 52/20, UAT TO 4160V BUS 4, trips on defect

Which ONE (1) of the following provides a correct plant response?

A. Loss of "A" condensate pump, "A" Feed pump auto trip, manual reactor trip required due to >80% RTP.

B. Automatic reactor trip due to >P-8 and loss of RCP "A".

C. Loss of "B" Feed pump, manual reactor trip not required due to automatic trip from loss of "C" RCP >P-8.

D. Automatic reactor trip due to >P-8 and loss of RCP "B".

77. Which ONE (1) of the following describes the correct location where the sample lines for R-16 (CV HVH COOLING WATER) tie into the Service Water system?

   A. Downstream of the HVH unit discharge isolation valves, outside of the CV.

   B. Downstream of the HVH unit discharge isolation valves, inside of the CV.

   C. Upstream of the HVH unit discharge isolation valves, outside of the CV.

   D. Upstream of the HVH unit discharge isolation valves, inside of the CV.

78. Which ONE (1) of the following describes a correct operation of the Motor Driven Fire Pump (MDFP)?

The MDFP is :

A. manually started from the Control Room when any fire alarm is received.

B. automatically started whenever Fire Header pressure falls to 115 psig.

C. automatically started when any fire suppression system is manually actuated.

D. manually secured from the Control Room when fire water is no longer required.

79. Given the following plant conditions:

- The Plant is shutdown following a reactor trip and safety injection
- CV pressure during the event peaked at 9 psig and now reads 3 psig
- You are directed by Path 1 to "RESET PHASE A AND PHASE B"

Which ONE (1) of the following describes the indications that you will see on the RTGB when this step is performed?

A. All of the Phase A&B component lights turn from pink to blue.

B. APP-002-D2, CV ISOL PHASE B, extinguishes.

C. APP-002-C2, CV ISOL PHASE A, extinguishes.

D. PCV-1716, INST AIR ISO TO CV, opens.

80. Given the following plant conditions:

- Mode 5
- RHR "B" pump running, system aligned for Core Cooling
- RCS temperature is 185°F
- RCS Pressure is 365 psig
- PT-403, RCS NR Pressure, fails high

Which ONE (1) of the following describes an effect that this has on plant operation?

A. RHR-750 & 751, Pump suctions From Loop #2 Hot Leg, cannot be remotely operated.

B. RHR-750 & 751, Pump suctions From Loop #2 Hot Leg, cannot be opened if they close.

C. PCV-145, PRESSURE, closes to restore pressure to setpoint.

D. PCV-145, PRESSURE, opens to restore pressure to setpoint.

81. Given the following plant conditions:

- Mode 1 at 100% RTP
- The temperature deviation setpoint for the Steam Dump Control System has been inadvertently set at 50°F during the last maintenance action.
- Rod H-8 drops

Which ONE (1) of the following describes a plant response to the above conditions?

A. The rods will fail to insert in automatic until a 50°F difference exist between Tave and Tref.

B. The steam line PORV's will open on a control signal from the Steam Dump Control System.

C. APP-003-C3, PRT HI PRESS, illuminates.

D. Steam dumps modulate open.

Test Name: 981NRSRO.TST
Test Date: Thursday, June 10, 1999

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	51	SD-010	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	52	SD-010	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	53	SD-010	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	54	SD-015	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	55	SD-006	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	56	FRP-H.5	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	57	MFW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	58	AFW	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	59	SD	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	SD	018	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	61	AOP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	62	OMM	005	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	63	GP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	64	AOP	009	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	65	EPP	009	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	66	SD	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	67	OP	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	68	SD	009	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	69	ITS	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	70	SD	011	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	71	SD	012	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	72	EPP	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	73	ITS	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	74	AOP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	75	SD	014	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	76	SD	016	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	77	SD	017	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	78	SD	013	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	79	PATH 1	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	80	GP	005	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	81	OP	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	82	SD	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	83	SD	006	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	84	OMM	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	85	OMM	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	86	OMM	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	87	GP	003	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	88	GP	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	89	PROC	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	90	OMP	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	91	ITS	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	92	10CFR20	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	93	EXPOSURE LIMITS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	94	OP	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	95	GP	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	96	FRP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	97	PROCEDURE NETWORK	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	98	EPP	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	99	FRP	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	100	EP-EMER. COORDINATOR	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C

Competencies	Applicant #1 SRO-U McDonald			Applicant #2 SRO-I Harshaw			Applicant #3 RO Leeth		
	SCENARIO			SCENARIO			SCENARIO		
	1 (S)	2	3	1 (R)	2 (B)	3 (S)	1 (B)	2(R)	3 (B)
Understand and Interpret Annunciators and Alarms	3, 4 5, 6, 7			3, 4 5, 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 7, 9	3, 4 5, 6, 7	2, 3 5, 6 7	1, 2, 3, 6, 8
Diagnose Events and Conditions	3, 5 6, 7			3, 5 6, 7	4, 5 6, 7	3, 4, 5, 7, 8, 9	3, 5 6, 7	2, 3 4, 5, 6 7	3, 6, 7, 8
Understand Plant and System Response	3, 4 5, 6			3, 4 5, 6	2, 4 5, 6, 7	3, 4, 5, 6, 7, 8, 9	3, 4 5, 6	2, 3 4, 5, 6 7	1, 2, 3, 6, 7, 8
Comply With and Use Procedures (1)	2, 5 6, 7			2, 5 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	2, 5 6, 7	2, 3 5, 6 7	1, 2, 3, 5, 6, 7, 8
Operate Control Boards (2)				1, 2, 3, 6, 7	2, 4 5, 6, 7		1, 2, 4, 5, 6 7	2, 3 4, 5, 6 7	1, 2, 3, 6, 7, 8
Communicate and Interact With the Crew	2, 3 4, 5			2, 3 4, 5	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	2, 3 4, 5	2, 3 4, 5, 6 7	1, 2, 3, 5, 6, 7
Demonstrate Supervisory Ability (3)	1, 2, 3 4, 5, 6 7			1, 2, 3 4, 5, 6 7		1, 2, 3 4, 5, 6 7, 8	1, 2, 3 4, 5, 6 7		
Comply With and Use Tech. Specs. (3)	2			2		1, 2, 3 4, 5, 6 7			

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SRO's.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: ______________________

Chief Examiner: ______________________

Competencies	Applicant #7 SRO-U Schwier								
	SCENARIO								
	1	2	3 (S)						
Understand and Interpret Annunciators and Alarms			1, 2, 3, 4, 5, 7, 9						
Diagnose Events and Conditions			3, 4, 5, 7, 8, 9						
Understand Plant and System Response			3, 4, 5, 6, 7, 8, 9						
Comply With and Use Procedures (1)			1, 2, 3, 4, 5, 6, 7, 8						
Operate Control Boards (2)									
Communicate and Interact With the Crew			1, 2, 3, 4, 5, 6, 7, 8						
Demonstrate Supervisory Ability (3)			1, 2, 3 4, 5, 6 7, 8						
Comply With and Use Tech. Specs. (3)			1, 2, 3 4, 5, 6 7						

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SRO's.

Instructions: Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: ______________________

Chief Examiner: ______________________

Competencies	Applicant #4 SRO-I Blaker			Applicant #5 RO Grant			Applicant #6 RO Sanders		
	SCENARIO			SCENARIO			SCENARIO		
	1 (S)	2 (S)	3 (R)	1 (R)	2	3 (B)	1 (B)	2	3 (R)
Understand and Interpret Annunciators and Alarms	3, 4 5, 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 7, 9	1, 2, 3, 4, 6		1, 2, 3, 6, 8	3, 4 5, 6, 7		1, 2, 3, 4, 5, 7, 8, 9
Diagnose Events and Conditions	3, 5 6, 7	4, 5 6, 7	3, 4, 5, 7, 8, 9	2, 3, 4, 6		3, 6, 7, 8	3, 5 6, 7		2, 3, 4, 5, 7, 8, 9
Understand Plant and System Response	3, 4 5, 6	2, 4 5, 6, 7	3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4 6		1, 2, 3, 6, 7, 8	3, 4 5, 6		1, 2, 3, 4, 5, 7, 8, 9
Comply With and Use Procedures (1)	2, 5 6, 7	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 6		1, 2, 3, 5, 6, 7, 8	2, 5 6, 7		1, 2, 3, 4, 5, 7, 8, 9
Operate Control Boards (2)		2, 4 5, 6, 7		1, 2, 3, 4, 6		1, 2, 3, 6, 7, 8	1, 2, 4, 5, 6 7		1, 2, 3, 4, 5, 7, 8, 9
Communicate and Interact With the Crew	2, 3 4, 5	2, 4 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3 4, 6		1, 2, 3, 5, 6, 7	2, 3 4, 5		1, 2, 3, 4, 5, 7, 8, 9
Demonstrate Supervisory Ability (3)	1, 2, 3 4, 5, 6 7		1, 2, 3 4, 5, 6 7, 8				1, 2, 3 4, 5, 6 7		
Comply With and Use Tech. Specs. (3)	2		1, 2, 3 4, 5, 6 7						

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SRO's.

Instructions: Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: ______________________

Chief Examiner: ______________________

	ISS 98-1-1	ISS 98-1-2	ISS 98-1-3		Totals
R	1, 4r	1, 6	1, 3		6
N	1	1, 6	1		4
I	3r, 7b	4r, 7b	9r, 6b, 4r		7
C	2, 4b, 5	2r, 3, 5, 9r	2, 3, 5		10
M	6	8	7, 8		4

Candidate

McDonald	ISS 98-1-1 (SRO)	ISS 98-1-2	ISS 98-1-3		Totals
R	1, 4				2
N	1				1
I	3, 7				2
C	2, 4, 5				3
M	6				1

Candidate

Harshaw	ISS 98-1-1 (RO)	ISS 98-1-2 (BOP)	ISS 98-1-3 (SRO)		Totals
R	1, 4	1, 6	1, 3		6
N	1	1, 6	1		4
I	3	7	4, 6, 9		5
C	2, 5	3, 5	2, 3, 5		7
M	6	8	7, 8		4

Candidate

Leeth	ISS 98-1-1 (BOP)	ISS 98-1-2 (RO)	ISS 98-1-3 (BOP)		Totals
R	1	1, 6	1, 3		5
N	1	1, 6	1		4
I	7	4	6		3
C	2, 4, 5	2	2, 3, 5		7
M	6	8	7, 8		4

Candidate

Blaker	ISS 98-1-1 (SRO)	ISS 98-1-2 (SRO)	ISS 98-1-3 (RO)		Totals
R	1, 4	1, 6	1, 3		6
N	1	1, 6	1		4
I	3, 7	4, 7	4, 9		6
C	2, 4, 5	2, 3, 5	2, 3, 5		9
M	6	8	7, 8		4

Candidate

Grant	ISS 98-1-1 (RO)	ISS 98-1-2	ISS 98-1-3 (BOP)		Totals
R	1, 4		1, 3		4
N	1		1		2
I	3		6		2
C	2, 5		2, 3, 5		5
M	6		7, 8		3

Candidate

Sanders	ISS 98-1-1 (BOP)	ISS 98-1-2	ISS 98-1-3 (RO)		Totals
R	1		1, 3		3
N	1		1		2
I	7		4, 9		3
C	2, 4, 5		2, 3, 5		6
M	6		7, 8		3

Candidate

Schwier	ISS 98-1-1	ISS 98-1-2	ISS 98-1-3 (SRO)		Totals
R			1, 3		2
N			1		1
I			4, 6, 9		3
C			2, 3, 5		3
M			7, 8		2

Author: ____________________ Chief Examiner: ____________________

Simulation Facility: H.B. Robinson Unit 2 Scenario No.: ___ Op-Test No.: ISS-98-1-1

Examiners: ____________________ Applicants: ____________________

____________________ ____________________

____________________ ____________________

Initial Conditions: IC#: 222; Power Level: 85%; Boron: 894 ppm (BOL); Tavg: 575°F; equilibrium xenon; Rods: Bank "D" at 185 steps.

Turnover: The shift is directed to reduce power to 75% to replace packing on "B" Heater Drain pump. "A" CCW pump motor is being replaced and is expected back in service in 4 hours. Radiation Monitor R-31A is out of service due to an electrical short, expected back this shift. The sampling frequency on S/G "C" has increased due to an identified leak of 145 gpd. There are severe thunderstorms in the area.

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
1	N/A	N (All) R (SRO, RO)	Begin normal shutdown to repair "B" HDP
2	IMF ESP06	C (ALL)	Call as Load Dispatcher and tell crew that they are experiencing high voltage along the grid (260 KV), AOP Actions
3	ICOR LT:459A	I (RO)	PZR Level Channel LT 459A fails low, AOP Actions
4	IMF CFW028B	R (RO) C (BOP)	Operator bumps pressure switch and trips "B" MFWP (20 gpm, 0 ramp, 0 time delay). **NOTE:** Clear malfunction after pump trips, AOP Actions
5	IMF CFW018C	C (ALL)	Feed line leak develops in CV (1.7E5, 5 sec ramp, 0 time delay), AOP actions are implemented
6	IMF CFW018C	M(ALL)	Feed line break in CV (1E7, 120 ramp, 0 time delay), reactor trip and safety injection
7	ICOR FIC1425	I (BOP)	Controller malfunction (AUTO) for "B" MDAFW disc flow
	IRF SIS034 IRF SIS035	C (RO) (NC)	SI injection valve (870B) fails to auto open
	IMF EPS04B IMF EDG3A	C (All) (NC)	Loss of 4KV Bus 1 & 2 (On generator lockout), "A" EDG output breaker trips upon closure
	IMF CFW08	C (BOP) (NC)	Valve failure for SDAFW pump discharge flow

- (N) Normal, (R) Reactivity, (I) Instrument, (C) Component, (M) Major,
- (NC) No Credit taken on ES-301-5

Submitted By: ____________________ Facility Reviewer: ____________________

Chief Examiner: ______________________________

Op-Test No.: ISS-98-1-1 Scenario No.: __ Event No.: 1 Page 1 of 1

Event Description: Begin power reduction IAW OP-105 to 75% to repair Heater Drain pump "B" (OP-105, "Maneuvering the Plant When Greater Than 25% Power")

Time	Position	Applicant's Actions or Behavior
	CREW	Walks down RTGB for power decrease
	SRO	Notifies load dispatcher that unit load will be reduced
	SRO	Notifies RC about increased rad levels due to crud bursts
	RO	Selects NR-45 recorder to highest IR and PR detector
		Note: The crew may decide to start an additional Charging pump and place another letdown orifice in service. IF additional letdown flow is desired, THEN perform the following:
	RO	Start additional Charging Pumps IAW OP-301
	RO	Place additional letdown orifice in service IAW OP-301
		Reduce Turbine load as follows:
	BOP	Select IMP-IN
	BOP	Set the desired load in the SETTER
	BOP	Select the desired Load Rate.
	RO	Adds portion of boric acid IAW OP-301.
	BOP	Depress the GO pushbutton
	BOP	Maintain Gland Seal pressure in the normal operating band

Op-Test No.: ISS-98-1-1 Scenario No.: __ Event No.: 2 Page 1 of 3

Event Description: High Switchyard Voltage AOP-031, "Operation With High Switchyard Voltage"

Time	Position	Applicant's Actions or Behavior
		If necessary, a call from the dispatcher will cue the crew into the high switchyard voltage
	SRO	Enters AOP-031, Operation With High Switchyard Voltage
	BOP	Check Main Generator - IN SERVICE
	BOP	Check Generator reactive load -Approximately 35 MVARS - **No**
	BOP	Positions Voltage Adjuster switch as needed
	SRO	Contact The Load Dispatcher To Take Action To Lower Grid Voltage (Note: Load Dispatcher tells crew that his actions are complete)
	BOP	Checks Voltage using I of the following • APP-036-E3, SUT Pri Over/Under Voltage - **Yes** • West Bus Voltage > 119 KV • 480V Bus E-1 or E-2 > 505 Volts
	BOP	Check ERFIS Points - Available - **Yes** ELV3020A - E-1 ELV3021A - E-2
	BOP	Log Emergency Bus voltage at one hour intervals in Attachment 2 for Bus voltages > 500 Volts
	SRO	Implement EAL's
	BOP	Check 480V BUS E-1 Voltage -Greater than 505 Volts - **Yes**
	RO	Perform The Following: Check Battery Charger A-1 in-service - **Yes** Check CCW Pump "B" - Running - **Yes** Check CCW Pump "A" - Available - **No**
	RO	Check Instrument Air Compressor "A" - Running in Manual - **No**
	RO	Restores M/U system to normal
	RO	Hold on turbine
	SRO	Refers to TS 3.8.1 and 3.8.2
	SRO	Postpone routine Emergency Diesel Generator "A" testing

Op-Test No.: ISS-98-1-1 Scenario No.: __ Event No.: 2 Page 2 of 3

Event Description: High Switchyard Voltage

Time	Position	Applicant's Actions or Behavior
	BOP	Log the time that any of this equipment was running above 505v: • Instrument Air Compressor "A" • Battery Charger "A" • EDG "A" Pre-lube Oil Pump • CCW Pump "B"
	BOP	Check 480V BUS E-2 Voltage - Greater than 505 Volts - **Yes**
	RO	Perform The Following: Check Battery Charger B-1 in-Service - **Yes** Check CCW Pump "C" - Running - **No**
	RO	Check Instrument Air Compressor "B" - Running in Manual - **No**
	SRO	Postpone routine Emergency Diesel Generator "B" testing
	BOP	Log the time that any of this equipment was running above 505v: Instrument Air Compressor "B" Battery Charger "B" EDG "B" Pre-lube Oil Pump CCW Pump "C"
	SRO	Increase Load On 480V BUS E-2 As Follows:
	RO	Check Charging Pump "C" - Running - **Yes**
	RO	Verify CV Recirc Fans (HVH-3 & 4) - Running - **Yes**
	BOP	Check Cont Rm Air Handling, HVA-1A is running and uses OP-906 to swap to HVA-1B: • HVA-1B switch in AUTO • Place HVA-1A to STOP • Verifies HVA-1B auto starts (40 sec T.D.) • Place HVA-1A switch to AUTO • Verify HVE-16 operating
	BOP	Check CRDM Cooling Fan, HVH-5B - Running - **No**
	BOP	Transfers fans, starts HVH-5B and stops HVH-5A
	BOP	Check Aux Bldg Exh Fan, HVE-2B - Running - **No**
	BOP	Transfers fans, starts HVE-2B and stops HVE-2A

Op-Test No.: ISS-98-1-1 Scenario No.: __ Event No.: 2 Page 3 of 3

Event Description: High Switchyard Voltage

Time	Position	Applicant's Actions or Behavior
	RO	Checks RHR in service - **No**
	BOP	Check 480V BUS E-2 Voltage - Greater than 505 VOLTS - **Yes**
	SRO	Stop Routine Testing Of Emergency Diesel Generator "B" AND The DS Diesel Generator
	BOP	Check 4KV BUS 3-4 TIE, BKR 52/19 - Open - **Yes**
	BOP	Transfers 4KV Bus 4 to Start-Up Transformer: • Uses key to energize synchroscope • Close on 52/19, 4KV Bus 3-4 Tie • Checks open 52/20, Unit Aux to 4KV Bus 4 • Turns off Synchroscope
	SRO	Checks E-1 and E-2 still greater than 505 volts and starts additional plant loads: • Evaluate idle loads • Balance loads • Do not start IAC A and B; Batt Chargers "A" and "B"; EDG "A" and "B" Pre-lube pumps; CCW pumps "B" and "C" • Start idle equipment IAW plant procedures
	SRO	Monitors voltage and loops back in procedure

Op-Test No.: ISS-98-1-1 Scenario No.: ___ Event No.: 3 Page 1 of 1

Event Description: Pressurizer Level Channel LT-459A fails low, AOP-025, "RTGB Instrument Failure"

Time	Position	Applicant's Actions or Behavior
	CREW	Identifies failure of LT-459A
	RO	Places 460A/B control switch in CLOSE
	RO	Select Manual on 459G
	RO	Restores level to 22-53%
	SRO	Verifies channels operable > 1 - YES
	RO	Selects LM-459 to 461 REPL 459
	RO	Selects LR-459 to REC 461
	RO	Prepares plant to restore 459G to Auto
	RO	Checks Ltdn Isolated - YES
	RO	Restores PZR level to w/in 1% of reference
	RO	Places 459G to Auto
		Operators may not get Ltdn restored before next event.

Op-Test No.:ISS-98-1-1 Scenario No.: ___ Event No.: 4 Page 1 of 2

Event Description: Main Feedwater Pump "B" Inadvertent Trip, AOP-010, "Main Feedwater/Condensate Malfunctions"

Time	Position	Applicant's Actions or Behavior
	BOP	Identifies trip of Main Feedwater Pump "B" and performs immediate actions
	BOP	(IA) Checks FRV operating properly in auto - **Yes**
	BOP	Identifies Main Feedwater Pumps tripped - **Yes**
	CREW	Checks Rx trip setpoint being approached - **NO**
	CREW	Uses table in step 4 to determine appropriate step
	SRO	Check power < 80% - **Yes**
	CREW	Reactor Power >60% so a manual turbine load decrease is initiated
	BOP	Checks at least 1 MFP running - YES
	BOP	Check S/G level trending to program
	RO	Checks Tavg trending to Tref
	SRO	Contacts I&C to trouble shoot feedwater problem
	SRO	Implements EAL's
	SRO	Contact chemistry to conduct Iodine sampling (<15% power change)
	RO	Borates to clear Rod Banks insertion alarm if APP-005 B5 is lit
	RO	Monitors Axial flux to ensure compliance with Tech. Specs.
	SRO	Notifies Load Dispatcher of limitations

Op-Test No.: ISS-98-1-1 Scenario No.: ___ Event No.: 5 Page 1 of 1

Event Description: Feedline leak actions IAW AOP-010

Time	Position	Applicant's Actions or Behavior
		Crew may initially go to AOP-016
	CREW	Uses RTGB alarms and indications to diagnose feed line leak
	SRO	Enters AOP-010 and verifies no immediate actions are needed (only immediate action checks)
	BOP	Checks FRV operating properly in auto - **Yes**
	CREW	Checks Rx trip setpoint being approached - **No**
	SRO	Uses table to determine appropriate step - Step 20
	BOP	Matches steam flow with feed flow, by reducing turbine load
		Leak gets larger at this point
		Note: Once the Evaluator is satisfied that the crew has satisfactory diagnosed the feedwater leak, he may instruct the booth operator to proceed with the next event.

Op-Test No.:ISS-98-1-1 Scenario No.: __ Event No.: 6-7 Page 1 of 5

Event Description: Feed line Break, Reactor Trip and SI

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnoses Feedline break (From alarms and RTGB indications). Leads to a Reactor Trip, Performs and broadcast immediate actions:
PATH-1	RO	Verify Reactor Trip (Rx trip/Bypass breakers open, rod bottom lights, IRPI and negative flux)
	BOP	Verify Turbine tripped (Stop and/or Gov valves)
	BOP	Checks E1 and E2 energized
	BOP	Loss of 4KV Bus 1 & 2 detected (May direct the use of EPP-25)
	RO	Checks for SI initiated/required - **Yes**
	CREW	Opens Foldout A-May transfer MCC-5 to DS Bus and use AOP-24, Att. 14 to strip IB #1 & #3 prior to transferring IB #1 to MCC-8
	RO	Verify Phase A valves
	BOP	Verify FW isolation
	BOP	Verify both FPs tripped
	BOP	Verify both MDAFW pumps running • Identifies MDAFW "A" not running (No power) • Identifies MDAFW "B" discharge valve controller failed to zero • Attempt to start at least one MDAFW pump
	BOP	Starts SDAFW as required • Identifies SDAFW pump discharge valve has failed closed
	RO	Verify 2 SI pumps running
	RO	Verify both RHR pumps running
	RO	Takes actions to start ESF pumps and align valves
	RO	Verify SI valves properly aligned
	CREW	**CRITICAL TASK: CREW OPENS ONE SI-870 VALVE FOR AN INJECTION PATH PRIOR TO RCS PRESSURE DECREASING TO 1500 PSIG**
	RO	At least 1 CCW pump running - **Yes**

Op-Test No.:ISS-98-1-1 Scenario No.: ___ Event No.: 6-7 Page 2 of 5

Event Description: Feedline Break, Reactor Trip and SI, FRP-H.1, "Response to Loss of Secondary Heat Sink"

Time	Position	Applicant's Actions or Behavior
	BOP	All SW & SW booster pumps running • Uses Supplement M to secure equipment (May not do here)
	RO	Verify HVH 1-4 running
	RO	Verify IVSW initiated
	RO	Verify CV vent isolation
	BOP	Verify control room vent to press. mode
	BOP	Evaluators note - If checked, inform operator that damper in kitchen is in correct position
	BOP	Verify both EDG's running • Identifies output breaker tripped on EDG "A"
	BOP	Dispatches AO's to restart chargers
	RO	CV remains less than 20 psig
	BOP	Verifies no steam line isolation and not required
	BOP	Opens breaker for HVS-1
	SRO	Note: The crew may Reset SI and isolate feed to the faulted S/G ("C"), after the PATH immediate actions are verified
	RO	Checks RCS press > [1250 psig] -**Yes**
	BOP	Checks NO AFW flow available with valves aligned and S/G levels less than [20%]
	SRO	Reset SPDS, monitor CSFST's and transition to FRP-H.1
FRP-H.1	BOP	Verifies correct procedure with a flow check
	RO	Determines if secondary heat sink is required - **Yes** • Checks RCS press > S/G press • Checks RCS Temp > 350 °F
	BOP	Checks intact S/G's < [37%] (WR) - **No**
	BOP	Checks CST > 10% - **Yes**

Op-Test No.: ISS-98-1-1 Scenario No.: ___ Event No.: 6-7 Page 3 of 5

Event Description: Feed line Break, Reactor Trip and SI

Time	Position	Applicant's Actions or Behavior
	BOP	Tries to establish flow from MDAFW pumps: • Checks breaker tripped - **No** • Checks discharge valves open
	BOP	Tries to start SDAFW pump • Checks Stm Shutoff valves open (V1-8A, B & C) • Checks discharge valves open
	BOP	Checks AFW intact
	BOP	Investigates and attempts to restore AFW flow: • Checks pump suction supply available • Positions local/remote switch to LOCAL • Depress local start pushbutton • Checks pump started (Note: Since one MDAFW pump is already running, this step may be skipped)
	BOP	Checks AFW flow > 300 gpm - **No**
	CREW	Contacts AO to verify valve line up
	RO	Stops RCP's
	BOP	Checks Condensate system in service - **Yes**
	BOP	Places Feedwater Isolation Key switches to the OVRD/RESET position for each S/G
	CREW	**CRITICAL TASK: OPERATORS MANUALLY ESTABLISHES AT LEAST 300 GPM AFW FLOW OR MAIN FEEDFLOW BEFORE ANY 2 S/G WIDE RANGE LEVELS DECREASE TO 26% [37%]**

Op-Test No.: ISS-98-1-1 Scenario No.: ___ Event No.: 6-7 Page 4 of 5

Event Description: Feedline Break, Reactor Trip and SI

Time	Position	Applicant's Actions or Behavior
	BOP	Establish Feed Flow • Closes V2-6, FW Header Section valves • Checks APP-007-A4 extinguished • Tries to start "B" Main FW pump (Will not start due to no oil pump)
	RO	Depressurizes RCS: • Checks letdown in service - **No** • Opens one PZR PORV • When RCS press is <1950 psig, closes the PORV
	RO	Block SI • Block PZR Press/Hi Stm Line Delta P SI • Block T-avg SI
	BOP	Depressurizes at least one S/G to <600 psig by dumping steam at max rate using the Steam Dump to Condenser
	BOP	Maintain at least one S/G press 240-600 psig
	BOP	Establishes Feed Flow from Condensate system: • Check at least one Condensate pump running • Open FRV Bypass valves
	BOP	Check Condensate flow established - **Yes**
	BOP	Verifies adequate condensate flow
	BOP	Obtains at least [20%] in one S/G
	SRO	Resets SPDS and returns to PATH
	BOP	Maintain S/G levels 10-50%
	RO	Checks RCP Therm Bar flow alarms - **Yes**
	BOP	Steam Dump to Steam Press mode
	RO	Checks RCS temp trending to 547°F (cooling down)
	RO	Checks PZR PORVs and spray valves closed
	RO	Notes no RCPs running
	SRO	Identifies faulted S/G, Resets SPDS and goes to EPP-011

Op-Test No.: ISS-98-1-1 Scenario No.: ____ Event No.: 6-7 Page 5 of 5

Event Description: Feed line Break, Reactor Trip and SI

Time	Position	Applicant's Actions or Behavior
	BOP	At least 1 intact S/G
	BOP	Identify intact and isolate faulted S/G using Supplement G
	BOP	Close MSIV and bypass
	BOP	Close FW reg and bypass valves
	BOP	Close V2-6C
	BOP	Close V2-14C and open brk (MCC-10)
	BOP	Close V2-16C and open brk (MCC-9)
	BOP	Close steam line PORV
	BOP	Close V1-8C and open brk (MCC-6)
	BOP	Check blowdown isolation and sample valves closed
	BOP	Direct AO to close MS-38
	BOP	Direct AO to verify MSIV before seat drains closed: • MS-37 OR • MS-37A OR • MS-42
	BOP	Direct AO to verify MSIV after seat drains closed • MS-39 OR • MS-45
	SRO	Checks no S/G's ruptured, returns to EPP-11
	BOP	Check CST level
	BOP	Check secondary rad monitors normal
	SRO	Return to PATH-1, Entry Point C

Op-Test No.: ISS-98-1-1 Scenario No.:___ Event No.: N/A Page 1 of 1

Event Description: EAL Classification

Time	Position	Applicant's Actions or Behavior
	SRO	At the completion of the scenario, the CRSS assumes the SEC position
	SRO	Uses EAL's to classify as Unusual Event (Feed Line Break)
	SRO	Implements Emergency Procedures as required

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

OPERATOR INITIAL TRAINING

INITIAL SIMULATOR SCENARIO

ISS-98-1-Scenario 1 (REV. 0)

HIGH SWITCHYARD VOLTAGE

"B" MAIN FEED PUMP TRIP

FEED LINE LEAK IN CONTAINMENT

FEED LINE BREAK IN CONTAINMENT

LOSS OF 4 KV BUS 1 AND 2

FRP-H.1, LOSS OF SECONDARY HEAT SINK

INITIAL SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: ISS-98-1-1 **REV.** 0 **DATE:** _____

SCENARIO NAME: High Switchyard Voltage, "B" Main Feed Pump Trip, Feed Line leak and Feed Line break in Containment, Loss of 4 KV Bus 1 and 2, FRP-H.1, Loss of Secondary Heat Sink

TEAM MEMBERS/INDIVIDUAL EVALUATIONS **EXAMINERS:**

CRSS	______________	**SAT** __	**UNSAT** __	________________
RO	______________	**SAT** __	**UNSAT** __	________________
BOP	______________	**SAT** __	**UNSAT** __	________________

OVERALL TEAM EVALUATION: SAT __ UNSAT __

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 85% BORON: 894 ppm Tavg: 575°F

TARGET VALUE: -2.96 TARGET BAND: ±5 MWD/MT: 150 RODS: 185

NORMAL CURRENTS	UPPER	LOWER
N-41	150.6	149.4
N-42	150.6	149.4
N-43	150.6	149.4
N-44	150.6	149.4

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:
- "A" CCW pump, motor replacement, back in 4 hours.
- "B" inverter due to capacitor failures, IB 3 on MCC-8, back in 8 hours. Battery Chargers A-1 and B-1 are in service
- Radiation Monitor R-31A is out of service due to an electrical short, expected back this shift.
- The sampling frequency on Steam Generator "C" has increased due to an identified leak of 145 gpd.

POWER HISTORY:
- Equilibrium Xenon, No power ramp rate restrictions. All the Charging pumps have been run within the last 5 hours.

INSTRUCTIONS:
- Reduce power to 75% to replace packing on "B" Heater Drain Pump
- There are severe thunderstorms in the area.

- Boric Acid calculations for the power reduction show 120 gals needed to maintain rods at 218.

SCENARIO DESCRIPTION

The candidates will assume the shift with power at 85% with directions to reduce power to 75% to remove "B" HDP for packing replacement. After sufficient power reduction, a high switchyard voltage condition will be reported by the load dispatcher, the candidates should respond by performing AOP-031. Shortly after completing the AOP-031 actions, an Auxiliary Operator inadvertently bumps the low lube oil pressure switch on "B" MFWP resulting in a trip on low lube oil pressure. Operators respond IAW AOP-010 and perform a manual runback to match feed/steam flow. The Outside AO will call the Control room and report that he tripped the Feedwater Pump. Tech Specs are referenced and the plant is stabilized. A short time later, due to the earlier Feedwater transient, a feedwater line leak will develop in containment. The leak will eventually result in a feedwater line break in the CV, requiring a reactor trip and safety injection. The generator lockout automatic bus transfer will fail resulting in a loss of 4 KV buses 1 & 2 one minute after the reactor trip. "A" EDG output breaker will trip resulting in a loss of train "A" safeguards equipment. The SI-870A & B valves fail closed, requiring operator actions. The discharge valves on the MDAFW pump "B" and the SDAFW pump fail closed requiring entry into FRP-H.1. Heat sink is re-established by depressurizing the RCS and using the Condensate pumps. The scenario can be terminated after the faulted S/G is isolated as per EPP-11 and a return to PATH 1.

SCENARIO OBJECTIVES

1. Evaluate the candidates response to High Switchyard Voltage IAW AOP-031.

2. Evaluate the candidates response to a loss of "B" Main Feedwater Pump IAW AOP-010.

3. Evaluate the candidates response to a Feed line leak in the containment IAW AOP-010.

4. Evaluate the candidates response to a Feed line break in the containment with a loss of the 4 KV bus 1 & 2 due to failure of generator lockout to transfer IAW Path 1.

5. Evaluate the candidates response to failure of SI train "B" components to actuate IAW Path 1.

6. Evaluate the candidates response to failure of AFW system to automatically supply adequate flow to S/G's.

7. Evaluate the CRSS's ability to direct the candidates during abnormal and emergency conditions in accordance with the above listed procedures.

8. Evaluate the CRSS's ability to use the EP procedures to properly classify the event and implement the Emergency Plan (at the completion of the scenario).

EVENT	COMMENTS
I. POWER REDUCTION IAW OP-105	
A. IF additional letdown flow is desired, THEN perform the following: • Start additional Charging Pumps as necessary • Place additional letdown orifice in service	
B. Reduce Turbine load as follows:	
1. Select IMP-IN	
2. Set the desired load in the SETTER.	
3. Select the desired Load Rate.	
4. Depress the GO pushbutton.	
II. HIGH SWITCHYARD VOLTAGE (AOP-031)	
A. Check Main Generator - IN SERVICE	
B. Check Generator reactive load -Approximately 35 MVARS (Voltage Adjuster switch positioned as needed)	
C. Contact The Load Dispatcher To Take Action To Lower Grid Voltage	When asked, inform the crew that the Load Dispatcher actions are complete.
D. Checks Voltage	
E. Check ERFIS Points - Available	
1. * ELV3020A - E-1	
2. * ELV3021A - E-2	
F. Log Emergency Bus Voltage At One hour intervals	
G. Implement EAL's	
H. Check 480V BUS E-1 Voltage -Greater than 505 Volts	
I. Perform The Following:	

EVENT	COMMENTS
1. Check Battery Charger A-1	Battery Charger A-1 is in service
2. Check CCW Pump "B" - Running	
3. Check CCW Pump "A" - Available	
J. Perform the Following:	
1. Start CCW Pump "A"	
2. Stop CCW Pump "B"	
K. Check Instrument Air Compressor "A" - Running in Manual - NO	
L. Postpone routine Emergency Diesel Generator "A" testing	
M. Log the time that any of the equipment below was running above 505 volts:	
1. Instrument Air Compressor "A"	
2. Battery Charger "A"	
3. EDG "A" Pre-lube Oil Pump	
4. CCW Pump "B"	
N. Check 480V BUS E-2 Voltage - Greater than 505 VOLTS	
O. Perform The Following:	
1. Check Battery Charger B-1 - in Service	Battery Charger B-1 is in service
2. Check CCW Pump "C" - Running - NO	
P. Check Instrument Air Compressor "B" - Running in Manual - NO	
Q. Postpone routine Emergency Diesel Generator "B" testing	

EVENT	COMMENTS

R. Log the time that any of the equipment below was running above 505 volts:

1. Instrument Air Compressor "B"
2. Battery Charger "B"
3. EDG "B" Pre-lube Oil Pump
4. CCW Pump "C"

S. Increase Load On 480V BUS E-2 As Follows:

1. Check Charging Pump "C" - Running
2. Verify CV Recirc Fans - Running
   a. HVH-3
   b. HVH-4
3. Check Cont Rm Air Handling, HVA-1A is running and uses OP-906 to swap to HVA-1B
   a. HVA-1B switch in AUTO
   b. Place HVA-1A to STOP
   c. Verifies HVA-1B auto starts (40 sec T.D.)
   d. Place HVA-1A switch to AUTO
   e. Verify HVE-16 operating
4. Check CRDM Cooling Fan, HVH-5B - Running
5. Check Aux Bldg Exh Fan, HVE-2B - Running
6. RHR not in service

T. Check 480V BUS E-2 Voltage - Greater than 505 VOLTS

U. Stop Routine Testing Of Emergency Diesel Generator "B" AND The DS Diesel Generator

V. Check 4KV BUS 3-4 TIE, BKR 52/19 - Open

W. Transfers 4KV Bus 4 to Start-Up Transformer

EVENT	COMMENTS

X. Checks E-1 and E-2 still greater than 505 volts and starts additional plant loads

Y. Monitors voltage and loops back in procedure

III. LT-459A FAILURE

A. Identifies failure of LT-459A

B. Places LCV-460A/B control switch in CLOSE

C. Select Manual on 459G

D. Restores level to 22-53%

E. Verifies channels operable >1

F. Selects LM-459 to 461 REPL 459

G. Selects LR-459 to REC 461

H. Prepares plant to restore 459G to Auto

I. Checks LTDN isolated

J. Restores PZR level to w/in 1% of reference

K. Places 459G to auto

IV. LOSS OF "B" MAIN FEEDWATER PUMP AOP-010

A. Immediate actions

1. Checks FRV operating properly in auto

2. Identifies Main Feedwater Pumps tripped

3. Reactor Power >60% so a Manual Turbine Runback is initiated as follows:

a. Steam Dump Mode switch placed in Steam press mode

EVENT	COMMENTS

b. LIMIT Down Pushbutton is used to reduce Turbine load in 40MW to 50MW increments until Turbine load is less than or equal to 500MW and Feed flow is greater than steam flow in all S/Gs

B. Subsequent actions

1. Turbine runback, complete (to stabilize plant)
2. Two Condensate pumps running
3. Reduce load at 1%/min to < 60%
4. Check Tave trending to Tref
5. Checks PORV's closed and press trending to 2235
6. Checks PZR level trending to ref level
7. Borates to clear Rod Banks insertion alarm
8. Monitors Axial flux and power > 15%, with Tavg within band
9. Resets Steam Dump
10. Checks VARS and Reg Balance within limits
11. Removes Turbine from Limiter and raises limiter
12. Notifies Load Dispatcher and Chemistry
13. Shutdowns unnecessary equipment
14. Contacts Maint., implements EAL's and exits procedure

C. After AO reports to Control Room that he tripped the "B" Main Feedwater Pump, the candidates will maintain the plant stable

III. MAIN FEEDWATER LEAK IN CV

EVENT	COMMENTS

A. Immediate actions (AOP-010)

1. Check FRV operating properly in auto

2. Notes that NO Main Feed pumps tripped

B. Subsequent actions

1. Notes that NO Condensate pumps tripped

2. Notes that NO Heater Drain pumps tripped

3. Cond and FW system not intact, performs actions:

   a. Dispatch operator to locate and isolate leak
   b. Notifies SSO of leak location and isolation

4. Checks for HDT level control failure

5. Checks for malfunctioned Heater Drain pump

6. Checks for malfunctioned Condensate pump

7. Notes HCV-1459 NOT open

8. Contacts Maint., implements EAL's and exits procedure

C. Continue Plant shutdown

IVI. FEED LINE BREAK IN CV /SAFETY INJECTION

A. Reactor Trip/SI, PATH-1 Immediate Actions

1. Verify Rx trip

2. Verify turbine trip

3. Verify E1 & E2 energized

   a. Loss of 4KV bus 1 & 2 detected

   b. Actions initiated to investigate/restore

82. Given the following plant conditions:

- Mode 1 at 100% RTP
- "A" CCW pump is running
- All equipment is in a normal lineup
- A lightning strike causes a major disruption on the grid
- The turbine trips due to the transient
- All off-site power is lost
- EDG "B" is under clearance

Which ONE (1) of the following describes which CCW pump(s) will be running two minutes after the trip?

A. No CCW pumps running.

B. "B" CCW pump running.

C. "A" CCW pump running.

D. "C" CCW pump running.

83. Which ONE (1) of the following describes the operation of the Service Water Booster Pumps?

A. With SI sequencer, will start regardless of suction pressure to maintain Service Water pressure inside CV during a DBALOCA.

B. With SI sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water pressure inside CV during a DBALOCA.

C. With Blackout sequencer, will not start until suction pressure is at least 30 psig to maintain Service Water to at least one CV Air Recirculation unit.

D. With Blackout sequencer, will start regardless of suction pressure to maintain Service Water to at least one CV Air Recirculation unit.

84. Which ONE (1) of the following describes a Grid System Alert condition what may or may not be performed during this condition?

During a System:

A. Reliability Alert, delay High Risk surveillances with a frequency of longer than quarterly without including the 25% grace period.

B. Economics Alert, reschedule High Risk quarterly surveillances without including the 25% grace period.

C. Reliability Alert, perform weekly High Risk surveillances as scheduled.

D. Economics Alert, all available generation sources are anticipated to be used.

85. Given the following plant conditions:

- You are in AOP-022, LOSS OF SERVICE WATER, SECTION "A"
- You have dispatched an operator to perform step 4
- PI-1684, SOUTH SW HEADER PRESSURE, indicates 37 psig and is stable
- "B" and "C" Circ water pumps are running

Using the attached AOP-022, SECTION "A", which ONE (1) of the following contains the correct actions that you should take in continuing with the procedure?

A. Perform RNO for step 5, go to step 9.

B. Perform steps 5 and 6, wait at step 7 until SW-188 is CLOSED, then go to step 9.

C. Perform RNO for step 5, perform step 6, go to step 9 while SW-188 is being CLOSED.

D. Once step 5 is completed, perform step 6, wait at step 7 until SW-188 is CLOSED, then go to step 8.

86. Which ONE (1) of the following plant conditions are definitive of Mode 2?

A. Keff <0.99.

B. Keff >0.99.

C. Shutdown Bank "A" greater than 20 inches.

D. Shutdown Bank "A" greater than 20 steps.

87. Given the following plant conditions:

- Mode 2
- Reactor startup in progress IAW GP-003, NORMAL PLANT STARTUP FROM HOT SHUTDOWN TO CRITICAL
- The reactor is stable, Keff<1
- Stable power levels are:
    - Highest SR=22,000 cps
    - Highest IR=1.8 x 10^{-11} amps
- Rod positions are:
    - Control Bank "C" @ 202 steps
    - Control Bank "D" @ 74 steps

Using the ATTACHMENT 6.2 provided, which ONE (1) of the following provides the closest correct lowest projected criticial position?

Control Bank "D" at:

A. 92 steps (SR)

B. 114 steps (IR)

C. 220 steps (SR)

D. 218 steps (IR)

88. Given the following plant conditions:

- Mode 3, after a trip that occurred 5 hours ago
- Pre-startup preparations are in progress, criticality scheduled for 8 hours from now
- Reactor trip breakers are open
- An Estimated Critical Condition has been prepared for the startup
- ECC RCS boron is 670 ppm
- Mode 3 SDM is 720 ppm
- Present RCS boron concentration is 680 ppm

Which ONE (1) of the following describes the required action to take to adjust RCS boron concentration?

A. Borate to 720 ppm, then withdraw SD Bank "A"

B. Withdraw SD Bank "A", then borate to 720 ppm

C. Dilute to 670 ppm, then withdraw SD Bank "A"

D. Withdraw SD Bank "A"and dilute to 670 ppm

89. Which ONE (1) of the following describes a correct action for making a boundary change on a clearance?

A. All work activities within the scope of the clearance shall be suspended for all boundary changes.

B. Must notify clearance holders (or designated alternate if off-site) for all boundary changes.

C. Temporary Tag Lifts should be restored within the shift that they were lifted.

D. If the clearance holder is not on site, can make the changes but must notify the clearance holder as soon as practical.

90. Given the following conditions:

- MODE 6, the Reactor Vessel Head is detensioned
- The SFP Gate Valve is closed
- The Reactor Vessel Head lift/removal is scheduled to commence in one hour. All required prerequisites/conditions are satisfied
- The Outage Shift Manager wants to allow planned maintenance on breaker MCC-6 / CMPT 2FL, FEED TO INSTRUMENT BUS 4, requiring IB-4 to be transferred to its alternate supply within the next 30 minutes

Which ONE (1) of the following correctly describes how **and** why this maintenance action impacts the scheduled Reactor Vessel Head lift ? (Refer to Attached OMP-003, Attachment 10.2)

A. No impact, can be lifted as scheduled. Alternate power supply for IB-4 is acceptable.

B. No impact, can be lifted as scheduled. Normal power supply for N31 or N32 is available.

C. Prohibits the lift. Inadequate PZR level instrumentation.

D. Prohibits the lift. Inadequate RCS temperature indication.

91. Given the following plant conditions:

- Mode 1 at 100% RTP
- A Pressurizer PORV failure has occurred
- RCS pressure reached 2000 psig during the fault and is increasing after operator actions
- RCS temperature is Tref +2°F
- Rods are in manual

Which ONE (1) of the following describes the correct evaluation of plant conditions **and** required actions with regards to core safety limits? [SAFETY LIMITS ATTACHED]

A. Violated SL 2.1.1. Must restore compliance and be in Mode 3 within one hour.

B. Always complied with SL 2.1.1. No actions required per safety limits.

C. Violated SL 2.1.1. Must restore compliance within one hour or be in Mode 3.

D. SL 2.1.1 is not applicable during transients. No actions required per safety limit.

92. Given the following plant conditions:

- Mode 1 at 100% RTP
- You have been directed to enter Containment to perform a task
- Your RWP states that your EPD dose alarm will be set at 80 mrem and your rate alarm will be set at 160 mrem/hr
- As you log-in using the Automated Access Control System, the computer screen warns you that RIMS is not operational

Which ONE (1) of the following describes the settings for your EPD dose and rate alarms **and** what is the appropriate response to a Dose alarm while you are performing the task?

A. Dose- 50mrem; Rate 100 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

B. Dose- 50mrem; Rate 100 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

C. Dose- 40mrem; Rate 80 mrem/hr. Stop what you are doing, exit the area, and notify Health Physics.

D. Dose- 40mrem; Rate 80 mrem/hr. Complete your task if you are close to completion because this will save dose overall, then exit the area, and notify Health Physics.

93. Given the following conditions:

- Mode 1 at 100% when a LBLOCA occurred
- A General Emergency has been in effect for 6 hours
- CV radiation levels have stabilized at 800 R/hour
- A large leak develops at FE-605, RHR Flow Element
- An Emergency Repair Team is assembled to enter Pipe Alley and stop the leak
- The Radiation Control Director reports expected dose will be 30 Rem thyroid committed dose (CDE) for each team member

Which ONE (1) of the following best describes the requirements for administration of Potassium Iodide?

Potassium Iodide shall be administered to all consenting repair team members:

A. older than 45 years of age, prior to entry into the Pipe Alley.

B. older than 45 years of age, within 24 hours of entry into the Pipe Alley.

C. regardless of age, prior to entry into the Pipe Alley.

D. regardless of age, within 24 hours of entry into the Pipe Alley.

94. Given the following plant conditions:

- Mode 6
- A CV purge is being established per OP-921, CONTAINMENT AIR HANDLING
- The Containment Personnel Airlock Doors will not remain open throughout the purge

Which ONE (1) of the following describes the effect this will have on the Auxiliary Building?

The Auxiliary building will:

A. pressurize unless HVS-1 is running.

B. pressurize unless HVS-1 is secured.

C. depressurize unless HVS-1 is running.

D. depressurize unless HVS-1 is secured.

95. Given the following plant conditions:

- Mode 5
- RCS pressure is 330 psig
- Chemistry has just added H_2O_2 (Hydrogen Peroxide) to the RCS

Which ONE (1) of the following describes an effect this chemical addition will have on the plant?

A. Radiaton levels will initially decrease in the letdown line.

B. The H_2O_2 will convert to water because RCS temperature is >200 degrees.

C. Cummulative exposure during the refueling will be reduced.

D. A sufficient hydrogen inventory will exist to scavenge oxygen.

96. Which ONE (1) of the following contains indications that all lead to entry into FRP-C.1, RESPONSE TO INADEQUATE CORE COOLING?

A. 2 RCP's running, CET's 705°F, RVLIS dynamic head 36%.

B. 1 RCP running, CET's 1135°F, RVLIS dynamic head 20%.

C. CET's 585°F, RVLIS full range 31%.

D. CET's 705°F, RVLIS full range 36%.

97. Given the following conditions:

- MODE 1, 100% RTP
- APP-001-B5, RCP HIGH VIB alarm
- The crew entered the appropriate abnormal operating procedure to address the RCP situation
- Moments later, APP-002-F7, INST AIR HDR LO PRESS alarms
- The RO reports IA Header pressure is 62 psig and decreasing
- The CRSS observes APP-004-C5, S/G C LO LVL & STM > FWF TRIP
- The RO attempts a manual reactor trip from both pushbuttons without success

Which ONE (1) of the following describes the proper crew actions?

Perform and verify the immediate actions of FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS, and then:

A. trip the affected RCP IAW AOP-018, RCP ABNORMAL CONDITIONS while continuing with FRP-S.1.

B. continue actions in AOP-018, RCP ABNORMAL CONDITIONS while continuing with FRP-S.1.

C. implement AOP-017, LOSS OF INSTRUMENT AIR, while continuing with FRP-S.1.

D. complete FRP-S.1 before addressing either condition.

98. During EPP-6, NATURAL CIRCULATION COOLDOWN WITH A STEAM VOID IN THE VESSEL, you are directed to establish Pressurizer level between 20-25%. Which ONE (1) of the following states the correct reason for establishing this low Pressurizer level?

This level is established prior to cooldown in order to:

A. provide additional static head to enhance natural circulation.

B. ensure natural circulation flow is not disrupted.

C. ensure the accommodation of void growth.

D. provide a method to monitor void growth.

99. Given the following plant conditions:

- The Unit is in FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
- All immediate actions have been performed
- Emergency boration is in progress
- AFW is in operation, all S/G's are 8% (NR)
- RCS pressure is 2300 psig

Which ONE (1) of the following desribes the feed flow requirement **and** the basis for it?

A. AFW flow > 300 gpm to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

B. AFW flow > 600 gpm to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

C. FW bypass flow >0.2 x 10^6 pph to ensure sufficient flow to remove decay heat generated from fission product decay after shutdown from 100% power.

D. FW bypass flow >0.4 x 10^6 pph to ensure sufficient flow to remove heat generated from power operations prior to shutdown and/or a return to power.

100. Given the following conditions:

- Mode 1 at 30% RTP
- An Unusual Event was declared 10 minutes ago due to an extended fire inside the protected area
- The fire has been extinguished and the plant stabilized

Which ONE (1) of the following responsibilities must be performed by the Site Emergency Coordinator **and** cannot be delegated?

A. Notifying state and county authorities of emergency classification.

B. Declaring that the emergency has been terminated.

C. Approving press releases prior to issuance.

D. Initiating on site protective actions.

Answer Key

Test Name: 981NRSRO.TST
Test Date: Thursday, June 10, 1999

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	1	AOP	008	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	2	DROPPED ROD GRAPHS	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	3	RODCNTRL	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	4	FRP	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	5	EPP	010	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	6	AOP	012	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	7	EPP-005	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	8	EPP-006	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	9	GP	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	10	FRP-S.1	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	11	EPP	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	12	EPP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	13	OMM	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	14	FRP-P.1	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	15	EPP	007	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	16	SD-038	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	17	GP	006	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	18	AOP-024	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	19	AOP	010	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	20	AP	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	21	CV INTEGRITY	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	22	CV	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	23	FRP	004	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	24	ACTIVITY	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	25	EPP-007	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	26	SD	019	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	27	AOP-016	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	28	EPP-009	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	29	AOP	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	30	AOP	011	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	31	AOP	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	32	NI	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	33	OMM	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	34	PATH-2	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	AOP-010	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	36	FRP-H.1	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	37	ITS	005	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	38	AOP-009	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	39	RMS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	AOP	013	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	41	AOP-025	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	42	EPP-001	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	43	FRP-H.2	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	44	AOP-001	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	TS-3.2.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	46	AOP-014	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	47	SD-021	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	48	SD-003	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	49	SD-006	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	50	SD-002	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B

EVENT	COMMENTS

4. SI initiated

B. Subsequent PATH actions

1. Opens Foldout A

2. Verify Phase A valves

3. Verify FW isolation

4. Verify both Feed Pumps tripped

5. Verify both MDAFW pumps running

   a. Identifies MDAFW "A" not running
   b. Identifies MDAFW "B" discharge valve controller failed to zero
   c. Attempt to start at least one MDAFW pump

6. Starts SDAFW as required

   a. Identifies SDAFW pump discharge valve has failed closed

7. Verify 2 SI pumps running

8. Verify both RHR pumps running

CRITICAL TASK: CREW OPENS ONE SI-870 VALVE FOR AN INJECTION PATH PRIOR TO RCS PRESSURE DECREASING TO 1500 PSIG

9. Verify SI valves properly aligned

10. At least 1 CCW pump running

11. All SW & SW booster pumps running, crew uses Supplement M to secure equip.

12. Verify HVH 1-4 running

13. Verify IVSW initiated

14. Verify CV vent isolation

EVENT	COMMENTS

15. Verify cont room vent to press. mode

16. Verify both EDG's running

    a. Notes breaker tripped on EDG "A"

17. Restart battery chargers

    a. Dispatches AOs to restart chargers

18. CV remains less than 20 psig

19. Verify steam line isolation

20. Opens breaker for HVS-1

21. Checks RCS press > 1350 psig

22. Checks NO AFW flow available with valves aligned and S/G levels less than 10%

23. Reset SPDS, monitor CSFST"s and go to FRP-H.1

C. FRP-H.1

1. Verifies correct procedure with a flow check

2. Determines secondary heat sink is required

3. Checks intact S/G's > 26% (WR)

4. Checks CST > 10%

5. Tries to establish flow from MDAFW pumps

6. Tries to start SDAFW pump, for flow

7. Checks AFW intact and takes local control of MDAFW pumps to establish flow

8. Stops RCP's

9. Checks Condensate system is not in service and

EVENT **COMMENTS**

uses RNO to place it in service

10. Places Feedwater Isolation Key switches to the OVRD/RESET position for each S/G

CRITICAL TASK: OPERATORS MANUALLY ESTABLISHES AT LEAST 300 GPM AFW FLOW OR MAIN FEEDFLOW BEFORE ANY 2 S/G WIDE RANGE LEVELS DECREASE TO 26% [37%]

11. Establish Feed Flow

    a. Closes V2-6, FW Header Section valves
    b. Tries to start "A" Main FW pump (Will not start due to no oil pump)

12. Depressurizes RCS to <1950 psig and blocks SI

13. Depressurizes at least one S/G to <600 psig by dumping steam at max rate

14. Maintains S/G press 240-600 psig

15. Establishes Condensate flow on the FRV Bypass valves

16. Obtains at least 10% in one S/G, then resets SPDS and returns to PATH

D. RETURN TO PATH-1 (A-11)

1. Maintain S/G levels 10-50%
2. Checks no RCP Therm Bar flow alarms
3. Steam Dump to Steam Press mode
4. Checks RCS temp trending to 547°F
5. Checks PZR PORVs and spray valves closed
6. Notes no RCPs running

EVENT	COMMENTS

7. Identifies faulted S/G, Resets SPDS and goes to EPP-011

E. Direct Faulted S/G Isolation IAW EPP-11

1. At least 1 intact S/G

CRITICAL TASK: CREW ISOLATES FAULTED S/G BEFORE THE RCS IS DEPRESSURIZED TO LESS THAN 1000 PSIG

2. Identify intact and isolate faulted S/G using Supplement G

a. Close MSIV and bypass

b. Close FW reg and bypass valves

c. Close V2-6C

d. Close V2-14C and open brk (MCC-10)

e. Close V2-16C and open brk (MCC-9)

f. Close steam line PORV

g. Close V1-8C and open brk (MCC-6)

h. Check blowdown isolation and sample valves closed

i. Direct AO to close MS-38

j. Direct AO to verify MSIV before seat drains closed

(1) MS-37 OR
(2) MS-37A OR
(3) MS-42

k. Direct AO to verify MSIV after seat drains closed

(1) MS-39 OR

EVENT	**COMMENTS**
(2) MS-45	
1. Checks no S/Gs ruptured, returns to EPP-11	
3. Check CST level	
4. Check secondary rad monitors normal	
F. RETURN TO PATH-1, ENTRY POINT C	
G. At the completion of the scenario, the CRSS assumes the SEC position	
1. Uses EAL's to classify as Unusual Event (Feed Line Break)	
2. Implements Emergency Procedures as required	

CREW CRITICAL TASK SUMMARY

CRITICAL TASK DESCRIPTION	SYSTEM/ MODE NUMBER	K/A NUMBER	IMPORT RO/SRO
1. CRITICAL TASK: CREW OPENS ONE SI-870 VALVE FOR AN INJECTION PATH PRIOR TO RCS PRESSURE DECREASING TO 1500 PSIG	000 009 103 000	EA1.08 A2.03 A3.01	4.0/4.1 3.5/3.8 3.9/4.2
2. CRITICAL TASK: OPERATORS MANUALLY ESTABLISHES AT LEAST 300 GPM AFW FLOW OR MAIN FEEDFLOW BEFORE ANY 2 S/G WIDE RANGE LEVELS DECREASE TO 26% [37%]	000 011 061 000 000 009 000 038	EA1.10 A2.02 A2.03 A2.04 A2.05 A2.07 A3.01 SGA.14 EA1.11 SGA1.10 EA1.14 EA1.20 SGA1.10	4.1/3.8 3.2/3.6 3.1/3.4 3.4/3.8 3.1/3.4 3.4/3.5 4.2/4.2 3.9/4.0 4.1/4.1 4.3/4.3 4.1/3.9 3.8/4.6 4.1/4.2
3. CRITICAL TASK: CREW ISOLATES FAULTED S/G BEFORE THE RCS IS DEPRESSURIZED TO LESS THAN 1000 PSIG	000 040	EA1.01 EA1.02 EA1.04 EA1.06 EA1.10 EA1.11 EA1.13 EA2.04	4.6/4.6 4.5/4.5 4.3/4.3 4.0/4.1 4.1/4.1 3.2/3.1 4.2/4.2 4.5/4.7

INITIAL CONDITIONS/TURNOVER INFORMATION:

POWER LEVEL: 85% BORON: 894 ppm Tavg: 575°F

TARGET VALUE: -2.96 TARGET BAND: ±5 MWD/MT: 150 RODS: 185D

NORMAL CURRENTS	UPPER	LOWER
N-41	150.6	149.4
N-42	150.6	149.4
N-43	150.6	149.4
N-44	150.6	149.4

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

- "A" CCW pump, motor replacement, back in 4 hours.
- "B" inverter due to capacitor failures, IB 3 on MCC8, back in 8 hours. Battery Chargers A-1 and B-1 are in service.
- Radiation Monitor R-31A is out of service due to an electrical short, expected back this shift.
- The sampling frequency on Steam Generator "A" has increased due to an identified leak of 145 gpd.

POWER HISTORY:

- Equilibrium Xenon, No power ramp rate restrictions. All the Charging pumps have been run within the last 5 hours.

INSTRUCTIONS:

- Reduce power to 75% to replace packing on "B" Heater Drain Pump
- There are severe thunderstorms in the area.
- Boric Acid calculations for the power reduction show 90 gals needed to maintain rods at 185.

EXAM INSTRUCTIONS

TIME	SIMULATOR OPERATION	SUPPLEMENTAL INFO
T-0	Init to IC-____ **Activate CAEP-98-1-1**	85% power
	Ensure CCW pump "B" is running	
	IRF RMS059, PWR OFF IRF-DS Bus EPS158 RACK OUT IRF- MCC-8 EPS251, CLOSE, IB-3 Backup IMF-EDG3A, "A" EDG output breaker trip Conditional on Generator lockout: IMF-EPS4B, Loss of 4 KV bus 2, and IMF-CFW08, SDAFW pump flow control valve failed closed and IRF CFW015 (None 0 0) 0 0 IRF SIS034 NO AUTO IRF SIS035 NO AUTO IOR XDOI114 (None 0 0) c (close) IOR XDOO014A OFF (1425 manual lamp) IOR XDOI117 TO "m" (1425 manual switch)	R31A Drawer Power Off, Elec. Short "A" CCW Pump OOS, Red Cap RTGB "B" Inverter OOS, Capacitor failure Breaker fault Failure of generator lockout to transfer to startup for bus 2 Valve malfunction FCV6416 Handwheel closed SI-870 A & B fail to auto open MDAFW pump "B" disc flow controller, FIC-1425 lower pushbutton, manual lamp (off) and manual switch to "close"
T~5	IMF EPS09, (None 0 0) 260	Call as Load Dispatcher and tell crew that they are experiencing high voltage along the grid
	ICOR LT:459A 0	PZR Level channel fails low
T~15	IMF CFW028B (None 0 0) 20gpm, 0 ramp AsIs	Operator bumps pressure switch and trips "B" MFWP
NOTE: Clear MAL-CFW28B after pump trips		
T~25	IMF CFW018C (None 0 0) 1.5E5, 120 sec ramp AsIs	Feed line leak in CV
T~35	IMF CFW018C (None 0 0) 1E7,0 AsIs	Feed line break in CV

Simulator Scenario Checklist for Initial Simulator Scenarios (ISS)

Scenario Number: ISS-98-1-1

____ 1. The scenario has clearly stated objectives and the initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but does not cue the crew into expected events

____ 2. Each event description consists of:
- the point in the scenario where each event is initiated
- the malfunctions that are entered to initiate the event
- the symptoms/cues that will be visible to the crew
- the expected operator actions (by shift position)
- the event termination point

____ 3. The scenario consists mostly of related events with no more than one non-mechanistic failure (e.g., pipe break) incorporated into the scenario without a credible preceding event (such as a seismic event) and the events are valid with respect to thermodynamics and physics

____ 4. Sequence and timing of events is reasonable and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives and all operator competencies can be evaluated

____ 5. If time compression techniques are used, the scenario summary clearly indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.

____ 6. The scenario modeling is not altered and the scenario has been validated

____ 7. Total malfunctions: 5-8

____ 8. Malfunctions AFTER EOP entry: 1-2

____ 9. Abnormal events: 2-4

____ 10. Major transients: 1-2

____ 11. EOP's entered requiring substantial actions: 1-2

____ 12. EOP Contingency Procedures used: 0-2

____ 13. Critical Tasks 2-3

Simulation Facility: H. B. Robinson Unit 2 Scenario No.: ______ Op. Test No.: ISS 98-1-2

Examiners:________________________ Applicants :________________________

Initial Conditions: The Unit is at 100% power. The following equipment is out of service: "B" Charging Pump for an oil change (OOS for 2 hours/back in 2 hours), SDAFW pump for steam inlet line leak (OOS for 8 hours/back in 14 hours), "A" CCW pump for excessive vibrations (pump uncoupled).

Turnover: Reduce power to 80% to remove HDP from service. Track equipment out of service and prepare for post maintenance testing to return equipment to service. Boron concentration 894 ppm, CBD at 218 steps, equilibrium xenon. Radiation Monitor R-31A is out of service due to an electrical short, expected back this shift. The sampling frequency on S/G "C" has increased due to an identified leak of 145 gpd. There are severe thunderstorms in the area..

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
1		N (All) R (SRO, RO)	Reduce power to remove HDP from service
2		C (RO)	Hot bearing on the running CCW Pump
3	MFI CRF03A ROD G-3	C (All)	Dropped Rod/Turbine Runback (No recovery allowed), AOP Actions
4	MFI CRF08	I (RO)	Tref input to rod control fails as is (Prevents auto rod motion)
5	MFI RCS09A	C (All)	75 gpm RCS Leak, AOP Actions
6		N (All) R (SRO, RO)	Power reduction due to excessive RCS leakage.
7	ICOR LT:496 100%	I (BOP)	Controlling S/G Level Channel Fails High, AOP Actions
8	MFI RCS01A	M (All)	LOCA
	MFI SIS01A MFI SIS01B	C (RO) (NC)	SI Failure to Auto Initiate
	MFI CCW1B (C)	C (RO) (NC)	Trip of running CCW pump after Path-1 entry point C, AOP Actions
	RFI CFW083 RFI CFW084	C (BOP) (NC)	"A" and "B" AFW pumps auto start failure

- (N) Normal, (R) Reactivity, (I) Instrument, (C) Component, (M) Major,
- (NC) No Credit taken on ES-301-5

Submitted By:________________________ Facility Reviewer:________________________

Chief Examiner:________________________

Scenario No.: ISS-98-1-2 Event No.: 1 Page 1 of 1

Event Description: Power reduction to remove heater drain pump from service

Time	Position	Applicant's Actions or Behavior
	SRO	Reviews the precautions and limitations and holds a crew brief
	SRO	Notifies the load dispatcher that unit load will be decreased to 80%
	SRO	Notifies RC of expected increase in rad levels in the CV pump bays and pipe alley
	RO	Verifies NR-45 selected to the highest reading channel (PR and IR)
	RO	If additional charging and letdown are desired, then start charging pumps and open additional orifices
	BOP	Select IMP-IN
	BOP	Set the desired load in the SETTER
	BOP	Select the desired load rate
	BOP	Depress the GO pushbutton
	RO	Monitor AFD and Tave-Tref

Scenario No.: ISS-98-1-2 Event No.: 2 Page 1 of 1

Event Description: Hot bearing on the running CCW pump

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Receive a phone call from the inside AO who reports a hot bearing on the running CCW pump
	RO	Evaluate the situation and start the standby CCW pump and shutdown the running CCW pump in accordance with applicable operating procedure (OP-306)
	RO	Dispatches AO to perform pre-start checks
	RO	Starts "C" CCW Pump
	RO	Stops "B" CCW Pump
	SRO	Notifies maintenance and/or Work Control to investigate pump
	SRO	Consult Tech Spec section 3.7.6 for CCW pumps and notes a 72 hour LCO with two CCW pumps out of service
		NOTE: If the crew elects to not rack out the pump breaker, then the pump will trip on its next start attempt
	SRO	May perform a crew brief if time allows

Scenario No.: ISS 98-1-2 Event No.: 3 Page 1 of 1

Event Description: Dropped Rod and associated Turbine Runback

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Recognize the dropped rod and identify that a turbine runback is in progress. They should observe megawatts, rod stepping in auto
	RO	Perform immediate actions of AOP-001 to check for unwarrented rod motion - **NO, rod motion expected for runback**
	SRO	Open AOP-001 and verify the immediate actions are complete. Ensure the plant is stabilizing and the operators have control
	RO	Determine if multiple rods have dropped by observing reactor power, rod bottom lights and IRPI's - **NO INDICATIONS**
	BOP	Check that a turbine runback has occurred - **YES**
	BOP	Check that S/G levels are trending to program level - **YES**
		NOTE: Tref input to rod control is failed which will cause rods to only respond to power mismatch signal
	RO	Check that Tave is trending to Tref - **NO**
		NOTE: The crew will need to calculate Tref due to failure
	RO	Restore Tave to within +0.5 and -2.5 degrees of Tref
	RO	Place rods in manual and insert rods, or borate to reduce Tave
	BOP	Verify proper operation of the condenser steam dumps - **YES**
	RO	Check PZR PORV's closed - **YES**
	RO	Check PZR pressure trending to 2235 psig- **NO**
	RO	Control heaters/spray as necessary to return pressure to 2235 psig
	RO	Check PZR level returning to program level - **YES**
	SRO	Go to Section A of AOP-001 to recover the dropped rod
		NOTE: Initiate 75 GPM RCS leak when Section"A" entered to retrieve the dropped rod
	SRO	Checks plant in Mode 1
	BOP	Verifies turbine runback
	RO	Check for urgent failure alarm
		At this point crew should go to AOP-016

Scenario No.: ISS 98-1-2 Event No.: 4 Page 1 of 1

Event Description: On entering Section A of AOP-001 a 75 gpm RCS leak will initiate over a two minute period

Time	Position	Applicant's Actions or Behavior
	SRO	Upon recognition of the RCS leakage, suspend usage of AOP-001 and enter AOP-016 for excessive RCS leakage
	RO	Check RCS level decreasing in an uncontrolled manner - **YES**
	CREW	Determine if Reactor Trip is needed - **NO**
	RO	Check VCT level less than 12.5 inches - **NO- May not be now, but this is a continuous action, may swap later**
	RO	Check charging pump status, any running - **YES**
	RO	Place running charging pumps in manual and increase to max speed
	RO	Check RCS level decreasing in an uncontrolled manner - **YES**
	RO	Check at least two charging pumps running - **If not already started in OP-105, then start second charging pump**
	RO	Place running charging pumps in manual and increase to max speed
	RO	Check RCS level decreasing in an uncontrolled manner - **YES**
	RO	Check any letdown in service - **YES**
	RO	Verify all letdown flowpaths isolated (CVC-460A/B closed, HIC 142 0%, HIC-137 0%, CVC-387 closed)
	RO	Check RCS level decreasing in an uncontrolled manner - **NO**
	RO	Control charging to maintain desired pressurizer level
	RO	Check available charging flow > RCS leakage - **YES**
	RO	Check VCT level less than 12.5 inches - **NO- May not be now, but this is a continuous action, may swap later**
	SRO	Implement Tech Specs 3.4.13 and appropriate EAL's
	RO/BOP	Check for primary to secondary leakage by checking R-15, condenser air ejector monitor, R-19's S/G blowdown monitors - **NO**
	SRO	Initiate leak rate determination
		Actions for R2 and R7 area rad monitors and R11 and/or R12 process monitors should be carried out as these alarms are received. These actions include: **- Source check and verify alarm** **- Make appropriate plant announcements** **- Notify E&RC for needed surveys and postings** **- Implement AOP-016**

Scenario No.: ISS 98-1-2 Event No.: N/A Page 1 of 1

Event Description: Power reduction for excessive leakage

Time	Position	Applicant's Actions or Behavior
	SRO	Refers to GP-006 precautions and limitations to commence plant S/D 1-5%/min
	SRO	Informs load dispatcher of plant S/D
	SRO/RO	Critical Data Stamp
	SRO	Verifies actions being taken and enters AOP-025, Section D
	SRO	Informs RC of increased radiation levels due to s/d
	BOP	Selects IMP-IN
	BOP	Sets desired load on the setter
	BOP	Sets desired load rate
	BOP	Depresses Go
	BOP	Verifies MSR Timer Vales controller is off
	BOP	Slowly closes MSR Timer Valves
	RO	Verifies Tavg w/in 5° F of Tref
	RO	Verifies PZR Level w/in 5% of reference level
	RO	Initiates boration IAW OP-301

Scenario No.: ISS 98-1-2 Event No.: 5 Page 1 of 1

Event Description: Controlling S/G Level Channel Fails high

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Identifies that LI-496 has failed high
	BOP	Immediate Action - Operator takes FRV to manual and controls S/G level 52%
	BOP	Immediate Action - Restores level to normal
	SRO	Verifies actions being taken and enters AOP-025, Section D
	BOP	Places affected FRV in Manual - **YES**
	BOP	Restores S/G to between 39-52% - **YES**
	SRO	Removes channel from service IAW OWP-027, SGL-9
	SRO	Implements EAL's
	SRO	Implements TS 3.3.1, 3.3.3, 3.3.4
		Examiner Note: On this transient the "C" FRV will fully close. If the crew does not expeditiously restore S/G level, the plant will trip on low S/G level.

Scenario No.: ISS 98-1-2 Event No.: 6 Page 1 of 4

Event Description: RCS 75 gpm leak escalates to a LOCA requiring a reactor trip and safety injection

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes the increase in RCS leakage and informs the SRO that leakage is greater than charging capability
	RO	Isolate letdown flowpath
	RO	Check RCS level decreasing in an uncontrolled manner - **YES**
	RO	Establish maximum charging flow **NOTE: This has probably already been completed since one charging pump is OOS**
	RO	Check RCS level decreasing in an uncontrolled manner - **YES**
	RO	Check accumulator discharge valves (865's) open - **YES**
	RO/BOP	Trip the reactor and turbine and go to PATH-1
	RO/BOP	Perform immediate operator actions of PATH-1 and verbalize
	RO	Verify the reactor is tripped - **YES**
	BOP	Verify the turbine is tripped - **YES**
	BOP	Verify E-1 and E-2 electrical busses energized - **YES**
	RO	Verify Safety Injection initiated - **NO, RO should recognize and either manually initiate SI or manually start components**
		Critical Task - The RO should note that SI has not auto initiated and manually initiates SI or manually starts components prior to reaching SI injection
		Critical Task - RCP's should be tripped when trip criteria are met in Foldout A prior to pumps tripping
		NOTE: Reactor Coolant Pumps should be tripped as soon as plant conditions meet Foldout A criteria
	SRO	Open Foldout A and review with the crew - action to isolate the MSR's

Scenario No.: ISS 98-1-2 Event No.: 6 Page 2 of 4

Event Description: RCS 75 gpm leak escalates to a LOCA requiring a reactor trip and safety injection

Time	Position	Applicant's Actions or Behavior
	RO	Verifies Phase A valves closed - **YES**
	BOP	Verifies FW isolation and MFW pumps tripped - **YES**
	BOP	Verifies both MDAFW pumps are running - **NO, BOP should recognize and manually start both pumps**
	BOP	Start the Steam Driven AFW pump - **NO, pump OOS**
	RO	Verifies HHSI and RHR pumps running - **YES**
	RO	Verifies SI valves are properly aligned - **YES**
	RO	Verifies that at least one CCW pump is running - **YES**
	BOP	Verifies that all Service Water (SW) and SW booster pumps are running - **YES**
	RO	Verify that HVH units are running - **YES**
	RO	Verify the IVSW system initiated - **YES**
	RO/BOP	Verify the control room ventilation system aligned for pressurization mode - **YES**
	BOP	Verify both EDG's running - **YES**
	BOP	Energize battery chargers as necessary
	RO	Verify CV pressure has remained less than 20 psig - **YES**
	RO/BOP	Auto steamline isolation required or initiated - **NO**
	BOP	Locally open breaker for HVS-1 at MCC-5
	RO	Check RCS pressure > 1350 [1250] psig - **NO**
	RO	Verify SI flow - **YES**
	RO	Check RCS pressure > 125 psig - **YES**
	BOP	At least 300 gpm AFW flow available - **YES**
	BOP	Control AFW flow to maintain S/G levels 10%[20] to 50%

Scenario No.: ISS 98-1-2 Event No.: 6 Page 3 of 4

Event Description: RCS 75 gpm leak escalates to a LOCA requiring a reactor trip and safety injection

Time	Position	Applicant's Actions or Behavior
	RO	RCP Thermal barrier hi and low flow alarms illuminated - **NO**
	BOP	Place the steam dump mode selector switch to steam pressure mode
	RO	Check RCS temperature stable at or trending to 547 - **NO, cooldown is due to the break and SI flow, not steam flow**
	RO	Verify PZR PORV, spray valves and aux spray valve closed - **YES**
	RO	Check at least one RCP running - **NO, all should be tripped due to meeting Foldout A criteria by this point in the scenario**
	BOP	Any S/G pressure decreasing in an uncontrolled manner or completely depressurized - **NO (Crew may call "C" S/G faulted and go to EPP-11)**
	BOP	Check for abnormal secondary rad levels - **NO**
	SRO	Go to PATH-1 entry point C, reset SPDS and initiate monitoring of the critical safety function status trees
		NOTE: If the conditions for FR-P.1 exist, then the crew should transition. No actions are taken due to the LOCA and the crew will quickly transition back to this point in the PATH
	SRO	Open and review Foldout B with the crew
		NOTE: At this time the "A" CCW pump will trip and the "B" CCW pump will trip if bkr still racked in
	RO	Recognize trip of the last remaining CCW pump and inform SRO - **Crew may attempt 1 restart of tripped pump**
		NOTE: AOP-014 actions for the RO are on event sheet #7
	RO/BOP	Request periodic samples of all S/G's
	RO	At least one RCP running - **NO**
	BOP	Any S/G with uncontrolled depressurization or completely depressurized - **NO**
	BOP	Control S/G level to maintain 10%[20] to 50%
	BOP	Any S/G level with an uncontrolled increase - **NO**

Scenario No.: ISS 98-1-2 Event No.: 6 Page 4 of 4

Event Description: RCS 75 gpm leak escalates to a LOCA requiring a reactor trip and safety injection

Time	Position	Applicant's Actions or Behavior
	BOP	Secondary radiation levels normal - **YES**
	RO	Verify PORV's closed and at least one block valve open - **YES**
	RO	Reset SI, CV Spray and Phase A and B
	RO	Establish instrument air to containment
	BOP	Check if offsite power is available to charging pumps - **YES**
	RO	Establish charging flow as necessary
	RO	Check CV Spray pumps running - **NO**
	RO	Check RCS subcooling > 35 [55] - **NO**
	RO	When below 10 E-10 amps then energize source range and transfer the recorders
	RO	Check RCS pressure > 275 [400] psig - **NO**
	BOP	Check E-1 and E-2 energized by offsite power - **YES**
	BOP	Starting air receivers repressurized to the unloaded EDG's - **YES**
	BOP	Stop the unloaded EDG's
	RO/BOP	Supplement D components capable of recirculation - **NO, should recognize that no CCW pumps are available and report to SRO**
	SRO	Transition to EPP-15
		NOTE: **Scenario may be terminated at this point at the discretion of the evaluators**

Scenario No.: ISS 98-1-2 Event No.: 7 Page 1 of 1

Event Description: Event Classification

Time	Position	Applicant's Actions or Behavior
	All SRO's	Using the EAL flowchart and the information provided in the logs and from the simulator, the event should be classified as a **SITE AREA EMERGENCY** due to the LOCA being greater than charging capability and the complete loss of a function listed in Table 3 (CCW capability).
	AOP-14	Go to Section "A"for CCW pump low pressure
	Actions	Check CV Spray and blackout signal actuated - **NO**
		Check E1 and E2 energized by offsite power - **YES**
		Start one CCW pump - **NO, none available**
		Check if reactor is critical - **NO**
		Stop all RCP's - **Already stopped**
		Check RHR pump status, any running in core cooling mode - **NO**
		Verify Natural circulation - **Have SI flow**
		Verify letdown is isolated - **YES**
		Check charging pumps any running - **YES**
		Check RCS temperature greater than 150 degrees - **YES**
		Dispatch AO to establish alternate cooling to charging pumps using attachment 1
		NOTE: Should not be complete for approximately 30 minutes
		Stop all but one charging pump
		Rotate charging pumps at 5 minute intervals until attachment 1 is completed
		Verify thermal barrier delta P is greater than 5 inches - **YES**
		Notify chemistry to stop any sampling in progress
		Check APP-036-B4, Spent Fuel Pit Hi Temp illuminated - **NO**
		Check CCW pumps running - **NO**
		NOTE: Can not continue with attachment until CCW flow is restored

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSE EXAMINATION SCENARIO

ISS 98-1-2

CCW PUMP HOT BEARING

DROPPED ROD

RCS LEAK

CONTROLLING S/G LEVEL CHANNEL FAILURE

LOCA

LOSS OF EMERGENCY COOLANT RECIRCULATION

DEVELOPED BY:__________________________ DATE _______

APPROVED BY: __________________________ DATE ________

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: ISS 98-1-2

SCENARIO NAME: Power reduction, Hot bearing on CCW pump, Dropped Rod, RCS Leak, S/G Level Channel Fails, LOCA, Loss of Emergency Coolant Recirculation

TEAM MEMBERS/INDIVIDUAL EVALUATIONS **EXAMINERS:**

CRSS	________________	**SAT** __	**UNSAT** __	________________________
RO	________________	**SAT** __	**UNSAT** __	________________________
BOP	________________	**SAT** __	**UNSAT** __	________________________

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 894 ppm Tavg: 575°F

TARGET VALUE: +0.1 TARGET BAND: ± 5 MWD/MT: 150 RODS: 218D

NORMAL CURRENTS	UPPER	LOWER
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

"B" charging pump has been out for 2 hours for oil change, return to service in ≈2 hours;

SDAFW pump has steam inlet line leak, has been OOS for 8 hours, will be returned to service in ≈14 hours;

"A" CCW pump OOS due to excessive vibration, pump uncoupled for removal.

R-31A is out of service due to an electrical short in the power supply

"C" S/G has 145 gpd identified leakage

POWER HISTORY:

Equilibrium Xenon, No power ramp rate restriction.

SCENARIO DESCRIPTION

After shift turnover and allowing the crew to walk down the board, the crew will commence a power reduction to remove the "A" Heater Drain pump from service for maintenance. After the power reduction has commenced, the initiating event will be a hot bearing on the running CCW. After the crew has started the standby pump and secured the running pump, one (1) control rod will fall into the core initiating a turbine runback. The Tref input into rod control will fail at 575 degrees causing the rod control system to only respond to the power mismatch signal. After the plant is stabilized, an RCS leak develops which will require a plant shutdown. The leak will escalate to a LOCA requiring a manual reactor/turbine trip and will result in a manual or automatic Safety Injection signal. PATH-1 will be entered and followed to mitigate the accident. Safety injection will fail to automatically initiate requiring manual action. The MDAFW pumps will fail to auto-start requiring identification and manual actuation. A failure of the last operable CCW Pump will require the use of EPP-015, Loss of Containment Recirculation Ability, due to insufficient Supplement D components. The scenario should progress until EPP-015 entry is directed. The exercise may be terminated at any time at the evaluator(s) discretion after EPP-015 entry.

SCENARIO OBJECTIVES

1. Evaluate the response to hot bearings on the running CCW pump.

2. Evaluate the response to a dropped control rods and attendant turbine runback IAW AOP-001.

3. Evaluate the response to excessive RCS leakage IAW AOP-016.

4. Evaluate the response to radiation alarms IAW AOP-005.

5. Evaluate the response to S/G Level channel failure IAW AOP-025.

6. Evaluate the response to a reactor trip and SI due to LOCA IAW PATH-1.

7. Evaluate the response to auto-start failures of safeguards equipment IAW PATH-1.

8. Evaluate the ability to recognize the need to conserve injection water due to the lack of sufficient Supplement D components and transition to EPP-015.

9. Evaluate the SRO's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENT	COMMENTS

I. POWER REDUCTION TO SECURE HDP

A. Actions for OP-105

1. Review precautions an limitations and hold crew brief

2. Notify load dispatcher that unit load will be decreased to 80%

3. Notify RC of expected increase in rad levels in the CV pump bays and pipe alley

4. Verify NR-45 selected to the highest reading channel (PR and IR)

5. If additional charging and letdown flow are desire, then initiate IAW OP-301

6. Reduce turbine load as follows — **IAO reports Chg Pump ready**

   a. Select IMP-IN

   b. Set the desired load in the SETTER

   c. Select the desired load rate

   d. Depress the GO pushbutton

7. Monitor AFD and Tave-Tref

II. HOT BEARING ON RUNNING CCW PUMP

NOTE: **Inside AO reports to the control room the outboard bearing on the "B" CCW pump is hot to the touch**

EVENT | **COMMENTS**

A. Crew shifts CCW pumps IAW OP-306

B. Notifies Maintenance and/or Work Control to investigate CCW pump bearings

C. Refers to T.S 3.7.6

NOTE: **If the crew elects to NOT rack out the breaker, the pump will trip on overcurrent during next attempted pump start**

II. DROPPED CONTROL ROD

A. Actions (AOP-001)

1. Check for unwarranted rod motion

2. Evaluate indications for multiple dropped rods

3. Checks for Turbine runback

4. Checks S/G levels

5. Checks Tavg trending to Tref — **Crew should ID Tref failure here**

6. Checks Condenser Steam Dump operation

7. Checks PZR PORV closed

8. Checks RCS Press. trending to 2235 psig

9. Checks PZR level trending to program

EVENT	COMMENTS
10. Go to Section A of AOP-001	Crew should go to AOP-016, steps below are for AOP

a. Check plant in Mode 1

b. Verify turbine runback

c. Check for urgent failure alarm

d. Check dropped rod in controlling bank

e. Open lift coil disconnect switch

NOTE: **Initiate the 75 gpm RCS leak. Upon recognition AOP-001 should be terminated and AOP-016 entered**

III. RCS LEAKAGE

A. Respond to RCS leakage IAW AOP-016

1. Check RCS level decreasing in and uncontrolled manner

2. Check charging pumps all stopped

3. Place running charging pumps in manual and adjust to max speed

4. Check RCS level decreasing in an uncontrolled manner

5. Adjust Charging and Letdown flow

EVENT | **COMMENTS**

a. Check two charging pumps running and at maximum speed

b. Check normal letdown in service

c. Reduce to a 45 gpm orifice

6. Check PZR level decreasing in an uncontrolled manner

7. Control charging to maintain PZR level

8. Checks charging flow > RCS Leakage

9. Check VCT level < 12.5 inches

10. Align charging pump suction to the RWST as follows

a. Check RWST level > 9%

b. Verify LCV-115B open

c. Verify LCV-115C closed

11. Implement T.S. 3.4.13

10. Implement EAL's

11. Check for primary to secondary leakage

NOTE: **The actions of AOP-005 for the rad monitor alarms should be taken as the alarms are received**

EVENT | **COMMENTS**

a. Source check and verify alarms

b. Make appropriate plant announcements

c. Notify E&RC for needed surveys

d. Go to AOP-016

12 Initiate leak determination

13. Crew determines the needs to commence a plant shutdown

IV. LT-496 FAILURE

A. Crew enters AOP-025 for LT-496 failure

1. RO/BOP identifies LT-496 fails high
2. "C" FRV is taken to manual
3. "C" S/G level is manually controlled to maintain 39-52%
4. Channel is removed from service IAW OWP-27.

NOTE: Leak rate increases. When recognized should go back to step #8, AOP-016

5. Isolate letdown flowpath

V. LOCA ACTIONS FROM AOP-016

A. Check RCS level decreasing in an uncontrolled manner
B. Establish maximum charging flow

EVENT	COMMENTS

C. Check RCS level decreasing in an uncontrolled manner

D. Check accumulator discharge valves open

E. Trip the reactor and go to PATH-1

VI. LOCA

A. PATH-1 Immediate Actions

1. Verify Rx tripped

2. Verify turbine tripped

3. E-1 & E-2 energized

4. Verify SI initiated — **Trigger to remove malf to allow manual SI**

NOTE: The RO should note that SI has not auto initiated and manually initiates SI or manually starts components

5. Opens Foldout A

NOTE: RCP's should be tripped when trip criteria are met in Foldout A

6. Verify Phase A valves closed

7. Verify FW isolation

8. Verify FW pumps tripped

9. Verify both MDAFW pumps running

NOTE: The BOP should note that

EVENT		COMMENTS

both AFW pumps failed to sequence/auto start and take manual action to start both pumps

10. Start SDAFW pump as necessary

NOTE: Pump is OOS and not available

11. Verify 2 SI pumps running

12. Verify both RHR pumps running

13. SI valves properly aligned

14. Verify at least 1 CCW pump running

15. Verify all SW & SW booster pumps running

16. Verify HVH 1-4 running

17. Verify IVSW system initiated

18. Verify CV ventilation isolation

19. Verify CR vent aligned for press. mode

20. Verify both EDG's running

21. Energize battery chargers as necessary

22. Verify CV pressure remains <20 psig

23. Checks for auto steam line isolation

24. Checks if steam line isolation

EVENT		COMMENTS
	required	
25.	Locally open breaker for HVS-1 at MCC-5	
26.	Check RCS pressure > 1350[1250] psig	
27.	Verify proper SI flow	
28.	Check RCS pressure > 125 psig	
29.	Verify at least 300 gpm AFW flow available	
30.	Verify AFW valves properly aligned	
31.	Control AFW to maintain S/G level 10 [20]% to 50%	
32.	Check RCP thermal barrier cooling water hi or low flow alarm lit	
33.	Place the steam dump mode selector Switch in manual	
34.	RCS temperature stable at or trending to 547 degrees	
35.	Check PZR PORV's closed	
36.	Check PZR spray and aux spray valve closed	
37.	Check at least one RCP running	
38.	Any S/G pressure decreasing in an uncontrolled manner or completely depressurized	
39.	R-15 and R-19A, B, C rad levels normal	

EVENT	COMMENTS

40. Check for indications of an RCS leak

    a. Rad monitors, CV pressure, sump level

41. Go to PATH-1 Entry Point C

B. Entry Point "C" on PATH-1

1. Reset SPDS, CSFST Monitoring

NOTE: **If FRP-P.1 conditions are met, the crew will transition but not implement any actions due to the LOCA**

2. Open Foldout "B"

NOTE: **At this time, "A"CCW pump trips. When "B" tries to start, the breaker trips**

NOTE: **The CRSS should assign AOP-014 to the RO or BOP to complete the required actions for loss of all CCW**

3. Request periodic activity sample of S/G's

4. Check at least one RCP running

5. Any S/G depressurizing in an uncontrolled manner of completely depressurized

EVENT		COMMENTS
6.	Control AFW flow to maintain S/G level	
7.	Check for S/G with uncontrolled level increase	
8.	Check R-15 and R-19's rad levels normal	
9.	Check PZR PORV's closed and at least one block valve open	
10.	Reset SI, CV Spray and Phase A and B	
11.	Establish instrument air to the CV	
12.	Check offsite power available to the charging pumps and establish desired flow	
13.	Check CV Spray pumps running	
14.	Check RCS subcooling > 35 [55]	
15.	When below 10 E-10 amps then energize the source ranges and transfer the recorders	
16.	Check RCS pressure > 275 [400] psig	
17.	If RCS pressure stable or increasing then stop the RHR pumps	
18.	E-1 and E-2 energized by offsite power	
19.	Check starting air receivers repressurized on the unloaded EDGs	
20.	Stop the unloaded EDG's	

EVENT | **COMMENTS**

21. Verify Supplement D components capable of recirculation

NOTE: **The crew should note that no CCW pumps are running and transition to EPP-15**

22. Transition to EPP-15

NOTE: **Scenario can be terminated at this point at the evaluators discretion**

C. All SRO's

1. Classify the event as Site Area Emergency (RCS leakage > makeup capability)

INITIAL CONDITIONS/TURNOVER INFORMATION:

POWER LEVEL: 100%   BORON: 894 ppm   Tavg: 575 °F

TARGET VALUE: +0.1   TARGET BAND: ±5   MWD/MT: 150   RODS: 218D

NORMAL CURRENTS	UPPER	LOWER
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm   100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

"B" charging pump has been out for 2 hours for oil change, return to service in ≈2 hours;

SDAFW pump has steam inlet line leak, has been OOS for 8 hours, will be returned to service in ≈14 hours;

"A" CCW pump OOS due to excessive vibration, pump uncoupled for removal.

R-31A is out of service due to an electrical short in the power supply

"C" S/G has 145gpd identified leakage

POWER HISTORY:

Equilibrium Xenon, No power ramp rate restriction.

PLANNED EVOLUTIONS:

Decrease power to 80% to remove the "A" Heater Drain pump from service IAW OP-105

EXAM INSTRUCTIONS

TIME	SIMULATOR OPERATION	SUPPLEMENTAL INFO
T-0	Init to IC 5 RUN and lineup "B CCW pump for operation, THEN FREEZE	CAEP 88_ISS_98_1_2
	MFI SIS01A: 2, 0 time delay MFI SIS01B: 2, 0 time delay	SI failure to auto initiate
	RFI EPS129 "B" chg pump bkr Place "Red Cap" on control switch	Breaker racked out. "B" pump OOS IAW OWP-CVC-2
	RFI EPS158 "A" CCW pump bkr Place "Red Cap" on control switch	
	RFI CFW083 NO_AUTO RFI CFW084 NO_AUTO	Auto start malfunction, "A" and "B" AFW pumps auto-start
	RFI EPS189, RFI EPS 226, RFI EPS 227 Place "Red Cap" on control switches	V1-8A, B, C bkrs open SDAFWP turbine under clearance
	Override SDAFWP Aux Oil SDAFWP turbine under clearance Pump lights off	From Panel Drawings
	CRF08: 575 degrees	Tref input into rod control fails at 575 degrees
	MFI CRF03A ROD G-3 Dropped rod	
	MFI RCS09A, 75 gpm, 120 sec. ramp	
	MFI RCS01A, 3%, 60 sec. ramp	Leak increases to LOCA
	MFI CCW1B (C): CCW Pump trip	Trip running CCW Pump after PATH-1 entry point "C"
		If needed trip the other CCW pump on overcurrent

Simulation Facility: H. B. Robinson Unit 2 Scenario No.:________ Op. Test No.: ISS 98-1-3

Examiners:______________________ Applicants :______________________

______________________ ______________________

______________________ ______________________

Initial Conditions: The Unit is at 100% power with the following equipment out of service: "A" EDG (OOS for 3 hours back in 2 hours), "A" AFW Pump (OOS for 6 hours back in 4 hours), HVH-1 (OOS for 8 hours back in 3 hours).

Turnover: BOC, Boron Conc. 894 ppm, CBD at 218 steps, Tavg = 575°F, Commence a normal plant shutdown to repair "A" MSIV. Radiation Monitor R-31A is out of service due to an electrical short, expected back this shift. The sampling frequency on S/G "C" has increased due to an identified leak of 145 gpd. There are severe thunderstorms in the area..

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
1		N (All) R (SRO, RO)	Plant Shutdown
2	MFI RCS016B	C (All)	RCP Vibration, AOP Actions
3	MFI EPS02A	C, R (All)	Loss of Instrument Bus 1(Turbine Runback), AOP Actions
4	ORP AA085A PC444J 60%	I (RO)	PC-444J partial failure causes spray valves to open, AOP Actions
5	MFI RCS09A	C (All)	RCS Leak (35 gpm), AOP Actions
6	ICOR RT:R15	I (BOP)	R-15 Fails, AOP Actions
7	MFI SGN02B, 400	M (All)	SGTR on "B" S/G
8	MFI RCS01B	M (All)	LOCA
9	ICOR PT:953/955	I (RO)	PI-953/955 fails as is causing CV Spray to fail to actuate
	RFI CFW083 CFW084	C (BOP) (NC)	MDAFW Pumps fail to auto start
	MFI CFW01C	C (BOP) (NC)	SDAFW pump trips
	MFI CNM03Q	C (RO) (NC)	RC-550 out of position

- (N) Normal, (R) Reactivity, (I) Instrument, (C) Component, (M) Major,
- (NC) No Credit taken on ES-301-5

Submitted By:______________________ Facility Reviewer:______________________

Chief Examiner:______________________

Scenario No.: ISS-98-1-3 Event No.: 1 Page 1 of 1

Event Description: Power reduction to remove heater drain pump from service

Time	Position	Applicant's Actions or Behavior
	SRO	Reviews the precautions and limitations and holds a crew brief
	SRO	Notifies the load dispatcher that unit load will be decreased to 80%
	SRO	Notifies RC of expected increase in rad levels in the CV pump bays and pipe alley
	RO	Verifies NR-45 selected to the highest reading channel (PR and IR)
	RO	If additional charging and letdown are desired, then start charging pumps and open additional orifices
	BOP	Select IMP-IN
	BOP	Set the desired load in the SETTER
	BOP	Select the desired load rate
	BOP	Depress the GO pushbutton
	RO	Monitor AFD and Tave-Tref

Scenario No.: ISS 98-1-3	Event No.: 2	Page 1 of 1
Event Description: RCP vibration "B" RCP		

Time	Position	Applicant's Actions or Behavior
	RO	Respond to the vibration alarm in accordance with the APP.
	SRO	Enters AOP-018 section "B" for RCP high vibrations
	BOP	Checks for a valid alarm - **YES**
	BOP	Checks vibrations levels to determine if RCP trip is required. Checks frame >5 or shaft > 20 - **NO**
	BOP	Checks if frame is > 3 and increasing > 0.2 mils per hour or shaft >15 and increasing > 1.0 mils per hour - **NO**
	SRO	Notify engineering to determine if installation of vibration analysis equipment for "B" RCP is required - **NO**
	RO	Monitor "B" RCP for proper operation; #1 seal leakoff < 235, Pump bearing temp < 225, Thrust guide temp < 200, - **All parameters within limits**
	RO	Check APP-001-E8 oil reservoir hi/lo level extinguished - **YES**
	RO	Check #1 seal leakoff between 1 and 5 gpm - **YES**
	RO	Check seal injection between 8-13 gpm
	SRO	Notify the Manager Operation's of RCP performance
	SRO	Implement EAL's
	SRO	Refer to TS 3.1.1, 3.3.1.1

Scenario No.: ISS 98-1-3	Event No.: 3	Page 1 of 2
Event Description: Loss of Instrument Bus #1 (AOP-024)		

Time	Position	Applicant's Actions or Behavior
	BOP	Verifies S/G level maintained at program level - **YES**
	BOP	Checks turbine runback has occurred - **YES**
	RO	Checks Tavg trending to Tref - **YES**
	CREW	Determines failed instrument bus - #1
	BOP	Checks Emergency Buses E1/E2 energized from 4160v - **YES**
	RO	Checks CVC-460A/B closed - **YES**
	RO	Place the selector switch for CVC-460A/B in closed
	CREW	Check IB #3 energized - **YES**
	CREW	Check affected IB energized - **NO**
	SRO	Dispatches AO to transfer IB to MCC-8
	CREW	Check load reduction > 100mw - **YES**
	BOP	Check steam dump to condenser actuated - **NO**
	BOP	Transfers steam dumps to steam pressure mode
	SRO	Stop all radioactive batch releases - none in progress
	SRO	Check status of local actions - bus transferred to MCC-8
	SRO	Check affected IB energized - **YES**
	RO/BOP	Restores affected controllers to Auto
	BOP	Checks Emergency Buses E1/E2 energized - **YES**
	BOP	Checks Emergency Buses E1/E2 energized from 4160v - **YES**
	SRO	Implement EAL's
	SRO	Check affected IB energized - **YES**
	RO	Check annunciator APP-005-A3 illuminated - **YES**

Scenario No.: ISS 98-1-3 Event No.: 3 Page 2 of 2

Event Description: Loss of Instrument Bus #1

Time	Position	Applicant's Actions or Behavior
	BOP	Resets DROPPED ROD MODE for NI-41
	RO	Checks pressurizer heaters deenergized - **YES**
	RO	Resets PZR heaters
	RO	Check normal letdown isolated
	RO	Restores letdown using OP-301
	RO	Checks APP-005-B5 extinguished - **YES**
	BOP	Check valve position limit light illuminated - **NO**
	BOP	Raises the valve position limiter
	BOP	Check steam dump valves closed - **YES**
	BOP	Resets steam dumps
	BOP	Check all radiation monitor alarms extinguished - **YES**
	BOP	Check control room ventilation aligned for pressurization mode - **NO**
	RO	Check PZR Safety acoustic monitor lights illuminated - **YES**
	BOP	Dispatches AO to reset acoustic monitors
	CREW	Check IB 1 thru 4 energized from their normal source - **NO**
	CREW	Check status of EDG's start signal received - **NO**
	RO/BOP	Check all safety related buses energized - **YES**
	BOP	Checks Emergency Buses E1/E2 energized - **YES**
	SRO	Checks TS 3.8.7, 3.8.9

Scenario No.: ISS 98-1-3 Event No.: 4 Page 1 of 1

Event Description: PC444 partial failure, AOP-019

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes pressure decrease and informs the SRO
		NOTE: **Will get alarms related to charging and PZR level due to the insurge caused when the spray valves open on initiation of the event**
	SRO	Implements the actions of AOP-019
	RO	Check PZR pressure less than 2335 psig - **YES**
	RO	Verify both PORV'ss closed - **YES**
	RO	Control spray valves and heaters to restore pressure to 2235 psig
	RO	Check PZR pressure control under operator control - **YES**
	RO	Check PC-444J operating properly in auto - **NO**
	RO	Place PC-444J in manual and adjust to restore RCS pressure
		NOTE: **PC-444J responds in manual as expected**
	SRO	Implement the EAL's
	SRO	Contact I & C and Work Control (may be done by BOP)
	SRO	Refer to Tech Spec 3.4.11, 3.4.4, 3.4.5, 3.4.1, 3.4.9, and TRM 3.4

Scenario No.: ISS-98-1-3 Event No.: 5 Page 1 of 1

Event Description: RCS leak, AOP-016 (Radiation Monitor Alarm actions are on next page)

Time	Position	Applicant's Actions or Behavior
	CREW	RCS leakage, decreasing in an uncontrolled manner - **NO**
	SRO/RO	Controls charging flow to maintain desired level
	SRO/RO	Checks charging flow less than RCS leakage - **NO**
	SRO	Implement TS 3.4.13/EAL's
	SRO/BOP	Checks for primary to secondary leakage - **NO**
	SRO	Contacts chemistry for S/G samples
	SRO	Initiates leak rate determination
	BOP	Checks R-17 increasing or in alarm - **NO**
	CREW	Checks cavity flooded - **NO**
	RO	Selects SP5 on ERFIS for leakage paths
	SRO	Contacts WCC SRO to determine in maintenance caused inventory loss
	RO	Determines in SI accumulator in-leakage - **NO**
	RO	Determines RCP Seal status, leakage indicated - **NO**
	CREW	Determines there is no leakage in the auxiliary building - **NO**
	CREW	Determines there is leakage in Containment - **YES**
	SRO	Check with SSO Containment Entry Desires - **NO (examiner respond as SSO if needed to facilitate decision**
	CREW	Check leakage source identified - **YES**
	SRO	Check personnel evacuation required - **NO in CV**
	CREW	Determine leak location
		SRO should direct plant S/D IAW GP-006

Scenario No.: ISS-98-1-3 Event No.: N/A Page 1 of 1

Event Description: Radiation Monitor Alarm Actions AOP-005 (R-11/12)

Time	Position	Applicant's Actions or Behavior
	BOP	Check R-11/12 selected to CV - **YES**
	BOP	Check personnel in CV - **NO**
	BOP	Check CV Isolation valves closed - **NO**
		CREW IDENTIFIES FAILURE OF CV PRESS RELIEF VALVES TO CLOSE AUTOMATICALLY AND INITIATES ACTION TO CLOSE VALVES.
	BOP	Place HVE-3/4 in Pre-purge
	BOP	Checks RCS temperature > 200 ° F
	BOP	Requests background check of R-11/12
	BOP	Determines primary leakage is occurring
	BOP	Directs SRO to implement EAL's
	BOP	Directs SRO to refer to TS

Scenario No.: ISS 98-1-3 Event No.: 1 Page 1 of 1

Event Description: Plant Shutdown GP-006

Time	Position	Applicant's Actions or Behavior
	SRO	Reviews procedure and Precautions & Limitations with the crew, this may be done prior to entering the simulator
	RO	Places additional charging pump in service
	RO	Places additional letdown orifice in service
		Reduce Turbine load as follows:
	BOP	Select IMP-IN
	BOP	Set the desired load in the SETTER
	BOP	Select the desired Load Rate.
	RO	Adds portion of boric acid IAW OP-301.
	BOP	Depress the GO pushbutton
	BOP	Maintain Gland Seal pressure in the normal operating band
	BOP	Verifies MSR Timer Valve Toggle Switch is off
	BOP	Begins to close MSR Valves
	RO	Verifies Tavg tracks with Tref4
	RO	Verifies PZR level tracks with program
	BOP	Secure a train of feed and condensate, when conditions are met

Scenario No.: ISS 98-1-3 Event No.: 6 Page 1 of 1

Event Description: R-15 Fails APP-036 and AOP-005

Time	Position	Applicant's Actions or Behavior
	BOP	Observes indication and determines that R-15 has failed
	SRO	Reviews TS and ODCM to determine appropriate actions
	BOP	Notifies E&RC
	BOP	Removes from service IAW OWP-014

Scenario No.: ISS 98-1-3 Event No.: 7 Page 1 of 1

Event Description: Reactor trip and PATH-1

Time	Position	Applicant's Actions or Behavior
	RO	Identifies leakage increases - **YES**
	SRO	Transitions back to AOP-016 Step 1 (May transition to AOP-035 due to tube leakage, depends on crew speed)
	SRO/RO	Check RCS level increasing uncontrolled manner - **YES**
	SRO/RO	Determines if Rx trip needed **(CREW may trip at this point based on degrading plant conditions)**
	RO.	Verify reactor tripped - **YES**
	BOP	Verify turbine tripped - **YES**
	BOP	Verify E-1 and E-2 are energized - **YES**
	RO	Verify SI initiated
	SRO	Opens Foldout A and reviews with the crew
	RO	Verifies Phase A valves closed - **NO** Identifies RC-550 open (takes action to have valve closed)
	BOP	Verifies FW isolation and MFW pumps tripped - **YES**
		CREW IDENTIFIES AUTO-START FAILURE OF MDAFWPs AND MANUALLY ESTABLISHES AT LEAST 300 GPM AFW FLOW.
	BOP	Verifies both MDAFW pumps are running - **NO ("A" OOS)**
	BOP	Start the Steam Driven AFW pump - **NO, the BOP should recognize the pump has tripped. May attempt one restart.**
	RO	Verifies HHSI and RHR pumps running - **YES**
	RO	Verifies SI valves are properly aligned - **YES**
	RO	Verifies that at least one CCW pump is running - **YES**
	BOP	Verifies that all Service Water (SW) and SW booster pumps are running - **YES**
	RO	Verify that HVH 1-4 units are running - **NO, RO should note that HVH-1 is OOS and can not be started**

Scenario No.: ISS 98-1-3	Event No.: 7	Page 1 of 4
Event Description: Path-1/SGTR		

Time	Position	Applicant's Actions or Behavior
	RO	Verify the IVSW system initiated - **YES**
	RO/BOP	Verify CV ventilation isolation - **YES**
	RO/BOP	Verify the control room vent system aligned for press mode - **YES**
	BOP	Verify both EDG's running - **NO, BOP should note that the "A" EDG is not running - OOS**
	BOP	Energize battery chargers as necessary - **All energized**
	RO	Verify CV pressure has remained less than 20 psig - **YES**
	RO	Verify automatic steam line isolation initiated - **NO**
	RO	Verify automatic steam line isolation required - **NO**
	BOP	Locally open breaker for HVS-1 at MCC-5
	RO	Check RCS pressure > 1350 [1250] psig - **NO**
	RO	Verify proper SI flow - **YES**
	RO	Check RCS pressure >125 psig - **YES**
	BOP	At least 300 gpm AFW flow available - **YES**
	BOP	Verify AFW valves are properly aligned - **YES**
	BOP	Control AFW flow to maintain S/G levels 10%[20] to 50%
	RO	RCP Thermal barrier hi and low flow alarms illuminated - **YES**
	RO	Verify at least one charging pump is running - **YES**
	BOP	Place the steam dump mode selector switch to manual

Scenario No.: ISS 98-1-3 Event No.: 7 Page 2 of 4

Event Description: Path-1/SGTR/LBLOCA

Time	Position	Applicant's Actions or Behavior
	RO	Check RCS temperature stable at or trending to 547F - **NO**
	RO	Verify PZR PORV, spray valves and aux spray valve closed - **YES**
	RO	Check at least one RCP running - **NO**
	BOP	Any S/G pressure decreasing in an uncontrolled manner or completely depressurized - **NO**
	BOP	R-15 and R-19's rad levels normal - **NO**
	CREW	Go to Path-2 Entry point J
	CREW	Reset SPDS and initiate monitoring of CSFST's
	CREW	Open Foldout C
	RO	Swaps NR-45 recorders when SR NI's are energized
	CREW	Requests samples of S/G's
	BOP	Places steam dumps in steam pressure mode
	BOP	Bypasses condensate polishers
	BOP	Directs AO's to isolate CST
	RO	At least 1 RCP running
	RO	At least 1 SI Pump running
	CREW	RCS Subcooling < 35°F
	SRO	Ruptured S/G isolated
		At this point a large break LOCA occurs (Crew should transition to EPP-17 IAW Foldout "C")
	CREW	Trips RCP's, Restarts RHR pumps
	RO	Verify proper RHR flow - **NO, SRO should instruct RO to have the AO align RHR valves as necessary**
	RO	**CREW RECOGNIZES NO RHR FLOW AND TAKES ACTIONS TO RESTORE FLOW.**
		CREW STARTS AT LEAST ONE CV SPRAY PUMP AND OPENS APPROPRIATE 880 VALVES.

Scenario No.: ISS 98-1-3 Event No.: 7 Page 3 of 4

Event Description: Path-1/SGTR/LBLOCA

Time	Position	Applicant's Actions or Behavior
	SRO	Reset SPDS and monitor CSFST's
		NOTE: **FRP-P.1 entry conditions will be met and the crew should transition. The crew will transition but not implement any actions due to the LBLOCA**
	SRO	Open Foldout "B" and review with the crew
	BOP	Request periodic activity samples of all S/G's
	RO	Check at least one RCP running - **NO**
	BOP	Any S/G depressurizing in an uncontrolled manner or completely depressurized - **NO**
	BOP	Control AFW to maintain S/G level between 10%[20%] and 50%
	BOP	Check for S/G with uncontrolled level increase - **NO**
	BOP	Check R-15 and R-19's rad levels normal - **YES**
	RO	Check PZR PORV's closed and at least one block valve open - **YES**
	SRO	If offsite power is lost, then restart safeguards equipment
	RO	Reset SI, CV spray, and Phase A and B
	RO	Establish instrument air to the CV
	BOP	Check offsite power available to the charging pumps and establish the desired amount of charging flow - **Amount will depend on current PZR level**
	RO	Check CV Spray pumps running - **YES**
	RO	When CV pressure decreases below 4 psig then stop the CV spray pumps and close SI-880 valves - **Stop pumps and close valves**
		NOTE: **When spray pumps are stopped, the AO should report back to the control room that he found RHR-764 closed (If AO was requested to investigate)**

Scenario No.: ISS 98-1-3 Event No.: 7 Page 4 of 4

Event Description: Path-1/SGTR/LBLOCA

Time	Position	Applicant's Actions or Behavior
	SRO	Provide direction to open RHR-764
	RO	Verify proper RHR flow - **YES**
	RO	Check RCS subcooling > 35 [55] - **NO**
	RO	When below 10 E-10 amps then reenergize the source ranges and transfer the recorders
	RO	Check RCS pressure > 275[400] psig - **NO**
	BOP	Check E-1 and E-2 energized by offsite power - **YES**
	BOP	Check starting air receivers repressurized on the unloaded EDG's
	BOP	Stop the unloaded EDG's
	RO	Verify Supplement "D" components capable of recirc - **YES**
		NOTE: **If the crew never requested the AO to investigate valve lineup, the crew will transition to EPP-15 due to loss of recirc capability**
	BOP	Check Aux building rad levels normal - **YES**
	BOP	Obtain RCS, boron, and H2 samples
	RO	Check RCS pressure > 275[400] psig - **NO**
	RO	Check flow from RHR pumps > 1200 gpm - **YES**
	BOP	Check RWST level > 27%
		NOTE: **If level is not below 27% the crew will be in a loop until this level criteria is met**
	RO	SI system aligned for cold leg recirc - **NO**
	SRO	Transition to EPP-9, "Transition to Cold Leg Recirculation"
		NOTE: **Scenario can be terminated at this point at the evaluator discretion**

Scenario No.: ISS 98-1-3	Event No.: N/A	Page 1 of 1

Event Description: Event Classification

Time	Position	Applicant's Actions or Behavior
	ALL SRO's	Classify event as a Site Area Emergency. This is based on RCS leakage > charging pump capacity and two fission product barriers breached

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

LICENSED OPERATOR

EXAMINATION SCENARIO

ISS-98-1-3

RCP VIBRATION

LOSS OF INSTRUMENT BUS

PZR SPRAY VALVE CONTROLLER FAILURE

RCS LEAK

SG TUBE RUPTURE

LOCA

DEVELOPED BY: ______________________________ DATE __________

APPROVED BY: ______________________________ DATE __________

Supervisor - LOCT

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: ISS-98-1-3 **REV.** 0 **DATE:** _______

SCENARIO NAME: RCP Vibration, Loss of Instrument Bus, PZR Spray Valve Controller Failure, SG Tube Rupture, RCS Leak, LOCA

TEAM MEMBERS/INDIVIDUAL EVALUATIONS **EXAMINERS:**

CRSS	________________	**SAT** ___	**UNSAT** ___	____________________
RO	________________	**SAT** ___	**UNSAT** ___	____________________
BOP	________________	**SAT** ___	**UNSAT** ___	____________________

OVERALL TEAM EVALUATION: SAT ___ **UNSAT** ___

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 894 ppm Tavg: 575 °F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

NORMAL CURRENTS	UPPER	LOWER
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100 °F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE: HVH-1, breaker to be replaced this shift, both CV Spray Pumps are operable;

"A" EDG OOS for governor repairs, out for two days, repairs to be completed in two days.

POWER HISTORY: Equilibrium Xenon, No power ramp rate restriction.

EVOLUTIONS IN PROGRESS: CV Pressure Relief in progress IAW OP-921, Section 6.1; maintain current power level.

SCENARIO DESCRIPTION

After shift turnover and allowing the crew to "walkdown" the board, the first event will be a failure of PC-444J which causes a PZR spray valve to open slowly and continuously until the controller is shifted to Manual. PZR pressure will decrease due to the excess spray flow requiring prompt operator action. When the plant has been stabilized, "B" Reactor Coolant Pump will develop high vibrations. These vibrations will cause seal leakoff flows and pump bearing temperatures to increase, indicating a severe problem with the RCP. The RCP vibrations will increase as the crew attempts to decrease power to remove the pump from service. As power is decreased RCS leakage will increase until the RCP shaft binds resulting in an overcurrent trip of the pump and subsequent Loss of Flow trip followed by a LBLOCA in the affected loop. The CV spray will fail to operate automatically requiring operator identification and manual actuation. RHR flow does not occur during large break LOCA due to valve RHR-764 being shut. The operating crew will investigate and have the valve re-opened. The LOCA will require entry into PATH-1 and eventually transition to FRP-P.1. The scenario may be terminated at any time after entry into FRP-P.1 at the discretion of the evaluator(s).

SCENARIO OBJECTIVES

1. Evaluate the crew's response to a failed PZR master pressure controller(PC-444J).
2. Evaluate the crew's response to a RCP vibration alarm IAW AOP-018.
3. Evaluate the crew's response to a RCP #1 seal failure IAW AOP-018.
4. Evaluate the crew's response to a loss of flow trip and LBLOCA IAW PATH-1.
5. Evaluate the crew's response to a failure of CV spray to actuate automatically.
6. Evaluate the crew's response to a lack of RHR flow following a LBLOCA.
7. Evaluate the operator's ability to respond to radiation monitor alarms IAW AOP-005.
8. Evaluate the CRSS's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENT | **COMMENTS**

I. POWER REDUCTION

A. Actions for OP-105

1. Review precautions an limitations and hold crew brief

2. Notify load dispatcher that unit load will be decreased to 80%

3. Notify RC of expected increase in rad levels in the CV pump bays and pipe alley

4. Verify NR-45 selected to the highest reading channel (PR and IR)

5. If additional charging and letdown flow are desire, then initiate IAW OP-301

6. Reduce turbine load as follows — **IAO reports Chg Pump ready**

   a. Select IMP-IN

   b. Set the desired load in the SETTER

   c. Select the desired load rate

   d. Depress the GO pushbutton

7. Monitor AFD and Tave-Tref

II. RCP VIBRATION

A. Enters AOP-018 Section "C"

1. Checks for valid alarm

2. Checks for Trip Criteria
Crew may determine to trip RX based on procedure interpretation

EVENT | **COMMENTS**

3. Contacts Tech. Support

4. Monitors RCP Parameters

5. Notifies Mgr - Operations

6. Implements EAL's

7. Refers to T.S.

III. LOSS OF INSTRUMENT BUS AOP-024

A. Verifies S/G level maintained at program level

B. Checks turbine runback has occurred

C. Checks Tavg trending to Tref

D. Determines failed instrument bus - #1

E. Checks Emergency Buses E1/E2 energized from 4160v

F. Checks CVC-460A/B closed

G. Place the selector switch for CVC-460A/B in closed

H. Check IB #3 energized

I. Check affected IB energized

J. Dispatches AO to transfer IB to MCC-8

K. Check load reduction > 100mw

L. Check steam dump to condenser actuated

M. Transfers steam dumps to steam pressure mode

N. Stop all radioactive batch releases - none in progress

O. Check status of local actions - bus transferred to MCC-8

EVENT | **COMMENTS**

P. Check affected IB energized

Q. Restores affected controllers to Auto

R. Checks Emergency Buses E1/E2 energized

S. Checks Emergency Buses E1/E2 energized from 4160v

T. Implement EAL's

U. Check affected IB energized

V. Check annunciator APP-005-A3 illuminated

IV. PC-444J FAILURE

A. Enters AOP-019

1. Checks PZR PORV's closed
2. Controls heaters and spray to restore RCS pressure
3. Checks PZR pressure under operator control
4. Checks PC-444J Operating properly in AUTO (RNO)
5. Places 444J in Manual, Controls RCS pressure
6. Implements EAL's
7. Contacts I&C
8. Refers to T.S.

II. RCS LEAKAGE

A. Respond to RCS leakage IAW AOP-016

EVENT | **COMMENTS**

1. RCS leakage, decreasing in an uncontrolled manner
2. Controls charging flow to maintain desired level
3. Checks charging flow less than RCS leakage
4. Implement TS 3.4.13/EAL's
5. Checks for primary to secondary leakage
6. Contacts chemistry for S/G samples
7. Initiates leak rate determination
8. Checks R-17 increasing or in alarm
9. Checks cavity flooded
10. Selects SP5 on ERFIS for leakage paths
11. Contacts WCC SRO to determine in maintenance caused inventory loss
12. Determines in SI accumulator in-leakage
13. Determines RCP Seal status, leakage indicated
14. Determines there is no leakage in the auxiliary building
15. Determines there is leakage in Containment
16. Check with SSO Containment Entry Desires **- NO (examiner respond as SSO if needed to facilitate decision)**
17. Check leakage source identified
18. Check personnel evacuation required

EVENT	COMMENTS

19. Determine leak location

20. SRO should direct plant S/D IAW GP-006

B. Respond to R2/R7 alarm IAW AOP-005

1. Verify alarm validity

2. Evacuate CV

3. Respond to R11/R12 increasing IAW Att. 12

4. Verify alarm validity

5. Verify auto actions

   a. Purge fans stopped

   b. Purge, pressure relief, & vacuum relief valves closed

   CREW IDENTIFIES FAILURE OF CV PRESS RELIEF VALVES TO CLOSE AUTOMATICALLY AND INITIATES ACTION TO CLOSE VALVES.

   - Manually close CV press. relief valves

6. Iodine Removal fans placed in service

7. Notify E&RC to sample and run background checks

8. Goes to AOP-016 or Path-1 if tripped

III. <u>LBLOCA</u>

A. PATH-1

1. Immediate actions

   a. Verify reactor tripped

EVENT **COMMENTS**

b. Verify turbine tripped

c. E-1 & E-2 energized

d. Verify SI initiated

2. Subsequent actions

a. Opens Foldout A

b. Verify Phase A valves closed

c. Verify FW isolation

d. Verify both FW pumps tripped

- **CREW IDENTIFIES AUTO-START FAILURE OF MDAFWPs AND MANUALLY ESTABLISHES AT LEAST 300 GPM AFW FLOW.**

e. Verify both MDAFW pumps running

f. Start SDAFW pump as necessary

g. Verify two SI pumps running

h. Verify both RHR pumps running

i. SI valves properly aligned

j. At least 1 CCW pump running

k. All SW & SW booster pumps running

l. Verify HVH 1-4 running

m. Verify IVSW system initiated

n. Verify CV ventilation isolation

o. Verify CR ventilation aligned for pressurization mode

EVENT **COMMENTS**

p. Verify both EDGs running

*q. Restart battery chargers within 30 min

r. CV pressure remained <20 psig - **NO**

CREW STARTS AT LEAST ONE CV SPRAY PUMP AND OPENS APPROPRIATE 880 VALVES.

(1) Manually initiate CV spray

(2) Verify phase B isolation valves closed

(3) Trip all RCP's

s. Auto steam line isolation initiated or required

3. Subsequent actions

a. Checks for SI flow

b. Checks for RHR flow - **NO FLOW**

CREW RECOGNIZES NO RHR FLOW AND TAKES ACTIONS TO RESTORE FLOW.

(1) Directs AO to check RHR lineup

c. Check AFW flow

d. Check PORVs, spray and aux spray valves closed

e. Check RCP trip criteria

f. Check for faulted or ruptured SG

g. Check CV pressure normal

EVENT | **COMMENTS**

B. Entry Point "C" on PATH-1

1. Reset SPDS and monitor CSFSTs

2. Enter FRP-P.1 due to depressurization and cooldown

C. CRSS assumes SEC position

1. SEC classifies event as Site Area Emergency (RCS leakage > makeup capability OR leakage > 50 gpm and path from CV to environment)

2. SEC implements EPs

INITIAL CONDITIONS/TURNOVER INFORMATION:

POWER LEVEL: 100%   BORON: 894 ppm   Tavg: 575 °F

TARGET VALUE: +0.1   TARGET BAND: ±5   MWD/MT: 150 RODS: 218D

NORMAL CURRENTS	UPPER	LOWER
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm   100 °F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE: HVH-1, breaker to be replaced this shift, both CV Spray Pumps are operable

"A" EDG OOS for governor repairs, out for two days, repairs to be completed in two days.

POWER HISTORY: Equilibrium Xenon, No power ramp rate restriction.

EVOLUTIONS IN PROGRESS: CV Pressure Relief in progress IAW OP-921, Section 6.1; maintain current power level.

EXAM INSTRUCTIONS

TIME	SIMULATOR OPERATION	SUPPLEMENTAL INFO
T-0	Init to IC - 5	
	Turn HVH-1 OFF at RTGB	HVH-1 OOS
	OPEN V12-10, V12-11 with RTGB switch	CV Pressure Relief in progress
	ORI XDDI087 OPEN, From Panel Mimics Override V12-10, 11 Switch to OPEN	V12-10, 11 fail to close on R-11/R-12 alarm or SI. Valves will be able to be closed with RTGB switch by removing overide
	CORDS PI:953, 0	Plugged sensing line (will inhibit auto spray actuation)
	CORDS PI:955, 0	Plugged sensing line (will inhibit auto spray actuation)
	RFI EPS133 RACK_OUT HVH-1 breaker racked out (E-1)	HVH-1 OOS. PUT "RED CAP" ON RTGB SWITCH
	RFI CFW083 NO_AUTO "A" MDAFWP Auto-start inhibit	MDAFWP auto-start failure
	RFI CFW084 NO_AUTO "B" MDAFWP Auto-start inhibit	MDAFWP auto-start failure
	RFI RHR009 0 RHR-764 to shut	RHR-764 out of position - shut
	MFI CFW01C: ACT, 0	SDAFWP Trips
	MFI EDG01A: ACT, 0 TD	"A" EDG OOS
	RFI EPS120 RACK_OUT "A" EDG output breaker racked out(E-1)	"A" EDG OOS, RED cap on RTGB

T≈3	ORP XAAA085A PC-444J, 60% 35 sec. ramp, 0 TD	PC-444J controller malfunction opens spray valve
T≈12	MFI RCS13B: 1.0 gpm, 300 sec ramp	RCP "B" #1 seal failure, gives ≈ 5.5 gpm seal leakoff
	MFI RCS16B: 15.5 mils, 420 sec ramp	RCP "B" high vibrations. Insert at same time as RCP "B" seal failure inserted above
T-V	MFI RCS09C: RCS leak, 300 gpm, 480 sec ramp	RCS leakage, insert after operators have entered AOP-018, section C for high vibrations
INSERT THE NEXT MALF (RCS02B) PRIOR TO OPERATORS TRIPPING RX		
T-V	MFI RCS02B: OC, 2 sec. TD,	"B" RCP trips prior to operators tripping RX per AOP-018
INSERT THE NEXT ACTION (DELETE V12-10/11 OVERRIDE) AT THE SAME TIME THE OPERATOR ATTEMPTS TO CLOSE V12-10/11 FROM THE RTGB SWITCH		
T-V	**Delete override on CV pressure relief switch** DOR XDDI087	Allows V12-10/11 valves to close when operator goes to CLOSE on RTGB switch
INSERT THE NEXT MALF (RCS01C) FOLLOWING AOP-016 ACTIONS OR PLANT TRIP		
T-V	MFI-RCS01C: 100%, 10 sec. ramp	Large Break LOCA
T-V	RFI RHR009 764 open	Report as AO that RHR-764 is shut after being directed to walkdown RHR valve lineup. Open valve if directed by control room.

Simulation Facility: H.B Robinson Unit 2 Scenario No.: ____ Op. Test No.: ISS 98-1-SB

Examiners: ______________________ Applicants: ______________________

______________________ ______________________

______________________ ______________________

Initial Conditions: The Unit is at 100% power. The following equipment is out of service: HVH-1 out for motor replacement, will be back this shift. "A" EDG out for governor repair (OOS for 2 days/back in 2 days).

Turnover: You have been instructed to maintain current plant conditions. Boron concentration 894 ppm, CBD at 218 steps. CV pressure relief in progress IAW OP-921, section 6.1. Radiation Monitor R-31A is out of service due to an electrical short, expected back this shift. The sampling frequency on S/G "C" has increased due to an identified leak of 145 gpd. There are severe thunderstorms in the area.

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
1	ICOR PT-444 100%	I (RO)	PT-444 fails high
2	MFI RCS013B	C (RO)	RCP "B" #1 Seal failure
3	MFI RCS016B	C (All)	RCP "B" high vibrations
4		N (All) R (SRO,RO)	Power reduction
5	MFI RCS02B	C (All)	RCP "B" trips on overcurrent prior to operator action to trip the RCP.
6	MFI RCS09A	C (All)	300 gpm RCS leak ramped over 120 seconds
7	MFI RCS01A	M (All)	Large Break LOCA
8	ICOR XDDI087	C (BOP)	Prevents auto closure of V12-10 and V12-11 on the R11/R12 alarm.
9	RFI RHR009 SHUT	C (RO)	RHR-764 out of position closed.
10	ICOR PI:953 ICOR PI:955	I (RO)	Auto spray actuation failure.
	MFI CFW01C	C (BOP) (NC)	SDAFW Pump trips on auto start.

- (N) Normal, (R) Reactivity, (I) Instrument, (C) Component, (M) Major,
- (NC) No Credit taken of ES-301-5

Submitted By:______________________ Facility Reviewer:______________________

Chief Examiner:______________________

Scenario No.: ISS 98-1-SB Event No.: 1 Page 1 of 1

Event Description: PT-444 fails High, AOP-025

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes malfunction and informs the SRO
		NOTE: Will get alarms related to charging and PZR level due to the insurge caused when the spray valves open on initiation of the event
	SRO	Implements the actions of AOP-025, Crew may enter/implement AOP-019 actions first
	RO	Check PZR pressure less than 2335 psig - **YES**
	RO	Verify both PORV's closed - **YES**
	RO	Control spray valves and heaters to restore pressure to 2235 psig
	RO	Check PZR pressure control under operator control - **YES**
	RO	Check PC-444J operating properly in auto - **NO**
	RO	Place PC-444J in manual and adjust to restore RCS pressure
		NOTE: PC-444J responds in manual as expected
	SRO	Implement the EAL's
	SRO	Contact I & C and Work Control (may be done by BOP)
	SRO	Refer to Tech Spec 3.4.11, 3.4.4, 3.4.5, 3.4.1, 3.4.9, and TRM 3.4

Scenario No.: ISS 98-1-SB Event No.: 2 Page 1 of 2

Event Description: RCP vibration / Seal leakage on the "B" RCP
Crew may enter either section "A" or "B" depending on which is observed first

Time	Position	Applicant's Actions or Behavior
	RO	Respond to the vibration alarm in accordance with the APP.
		NOTE: **After the vibration alarm is received, then seal leakage will begin to increase to ensure they enter Section "C" first**
	SRO	Enters AOP-018 section "B" for RCP high vibrations
	BOP	Checks for a valid alarm - **YES**
	BOP	Checks vibrations levels to determine if RCP trip is required. Checks frame >5 or shaft > 20 - **NO**
	BOP	Checks if frame is > 3 and increasing > 0.2 mils per hour or shaft >15 and increasing > 1.0 mils per hour - **NO**
	SRO	Notify engineering to determine if installation of vibration analysis equipment for "B" RCP is required - **NO**
	RO	Monitor "B" RCP for proper operation; #1 seal leakoff < 235, Pump bearing temp < 225, Thrust guide temp < 200, - **All parameters within limits**
	RO	Check APP-001-E8 oil reservoir hi/lo level extinguished - **YES**
	RO	Check #1 seal leakoff between 1 and 5 gpm - **NO**
	SRO	Go to section "A" of the procedure to address the hi seal leakoff
	RO	Check any RCP #1 seal leakoff flow > 5.7 gpm - **NO**
	RO	Check "B" RCP #1 seal leakoff flow less than 0.8 gpm - **NO**
	RO	Check "B" RCP #2 seal problem suspected - **NO**
	RO	Check "B" RCP #1 seal leakoff flow less than 5 gpm - **NO**
	RO	Closely monitor "B" RCP seal parameters
	SRO	Notify engineering of RCP seal condition and contact Westinghouse for further instruction

Scenario No.: ISS 98-1-SB Event No.: 2 Page 2 of 2

Event Description: RCP vibration / Seal leakage on the "B" RCP

Time	Position	Applicant's Actions or Behavior
	RO	Maintain seal injection 8-13 gpm
		NOTE: **Inform the SRO that Westinghouse has already been contacted and their recommendations is to shut down the pump as soon as possible, no trip**
		NOTE: **Operations Manager directs 2% per minute load reduction**
	SRO	Implements EAL's
	SRO	Refers to TS 3.2, 3.1.5, 3.1.1, 3.3.1.1, 3.6.3
	SRO	Commence plant shutdown in accordance with GP-006
	CREW	**Crew may go back and complete Section B while plant shutdown is in progress**
		NOTE: **After load decrease has commenced and at the evaluators discretion, the #1 seal leakoff should increase above 6 gpm**
	RO	Recognize the increase in #1 seal leakoff and inform the SRO
		NOTE: **As soon after the RO notes increase in seal leakoff, and at the evaluators discretion, trip the "B" RCP on overcurrent and increase seal leakage to 300 gpm**

Scenario No.: ISS 98-1-SB Event No.: 1 Page 1 of 1

Event Description: Plant Shutdown GP-006

Time	Position	Applicant's Actions or Behavior
	SRO	Reviews procedure and Precautions & Limitations with the crew, this may be done prior to entering the simulator
	RO	Places additional charging pump in service
	RO	Places additional letdown orifice in service
		Reduce Turbine load as follows:
	BOP	Select IMP-IN
	BOP	Set the desired load in the SETTER
	BOP	Select the desired Load Rate.
	RO	Adds portion of boric acid IAW OP-301.
	BOP	Depress the GO pushbutton
	BOP	Maintain Gland Seal pressure in the normal operating band
	BOP	Verifies MSR Timer Valve Toggle Switch is off
	BOP	Begins to close MSR Valves
	RO	Verifies Tavg tracks with Tref4
	RO	Verifies PZR level tracks with program
	BOP	Secure a train of feed and condensate, when conditions are met

Scenario No.:ISS 98-1-SB Event No.: 3 Page 1 of 1

Event Description: Reactor trip due to the "B" RCP, PATH-1 and AOP-018 actions

Time	Position	Applicant's Actions or Behavior
		NOTE: **AOP-018 is a concurrent AOP and actions must be completed for satisfactory shutdown of the "B" RCP**
	RO	Verify reactor tripped - **YES**
	BOP	Verify turbine tripped - **YES**
	BOP	Verify E-1 and E-2 are energized - **YES**
	RO	Verify SI initiated
		NOTE: **Depending on timing, SI has not initiated. Due to degrading plant conditions, the crew should manually initiate SI**
		NOTE: **The following are the AOP-018 actions that should also be completed concurrently**
	RO	Trip the "B" RCP
	RO	Place PCV-455A in manual (spray valve) and adjust output to zero
	RO	After 90 seconds has elapsed since pump trip, shut CVC-303B
		NOTE: **Insert LBLOCA after the immediate actions of PATH-1 have been completed**
	RO	Check Seal injection flow 8-13 gpm
	RO	Checks FCV-626 closed - NO
	SRO	Implements EAL's
	SRO	Refers to TS, exits AOP-018

Scenario No.: ISS 98-1-SB Event No.: 4 Page 1 of 4

Event Description: LBLOCA PATH-1

Time	Position	Applicant's Actions or Behavior
	SRO	Opens Foldout A and reviews with the crew
	RO	Verifies Phase A valves closed - **YES**
	BOP	Verifies FW isolation and MFW pumps tripped - **YES**
	BOP	Verifies both MDAFW pumps are running - **YES**
	BOP	Start the Steam Driven AFW pump - **NO, the BOP should recognize the pump has tripped. May attempt one restart.**
	RO	Verifies HHSI and RHR pumps running - **YES**
	RO	Verifies SI valves are properly aligned - **YES**
	RO	Verifies that at least one CCW pump is running - **YES**
	BOP	Verifies that all Service Water (SW) and SW booster pumps are running - **YES**
	RO	Verify that HVH 1-4 units are running - **NO, RO should note that HVH-1 is OOS and can not be started**
	RO	Verify the IVSW system initiated - **YES**
	RO/BOP	Verify CV ventilation isolation - **NO, BOP should recognize the failure of V12-10 and 11 to close. Can be closed manually from the RTGB**
	RO/BOP	Verify the control room vent system aligned for press mode - **YES**
	BOP	Verify both EDG's running - **NO, BOP should note that the "A" EDG is not running - OOS**
	BOP	Energize battery chargers as necessary - **All energized**
	RO	Verify CV pressure has remained less than 20 psig - **NO, RO should note that CV spray did not actuate and manually actuate**
	RO	Verify CV spray initiated - **NO**
	RO	Verify CV spray pumps running with valves aligned properly - **NO**

Scenario No.: ISS 98-1-SB Event No.: 4 Page 2 of 4

Event Description: LBLOCA PATH-1

Time	Position	Applicant's Actions or Behavior
	RO	Verify approximately 12 gpm spray additive flow - **YES**
	RO	Verify phase B isolation valves closed - **YES**
	RO	Stop all RCP's - **Already stopped**
	BOP	Verify all MSIV's and MSIV bypass valves closed - **YES**
	BOP	Locally open breaker for HVS-1 at MCC-5
	RO	Check RCS pressure > 1350 [1250] psig - **NO**
	RO	Verify proper SI flow - **YES**
	RO	Check RCS pressure >125 psig - **NO**
	RO	Verify proper RHR flow - **NO, SRO should instruct RO to have the AO align RHR valves as necessary**
	BOP	At least 300 gpm AFW flow available - **YES**
	BOP	Verify AFW valves are properly aligned - **YES**
	BOP	Control AFW flow to maintain S/G levels 10%[20] to 50%
	RO	RCP Thermal barrier hi and low flow alarms illuminated - **YES**
	RO	Verify at least one charging pump is running - **YES**
	BOP	Place the steam dump mode selector switch to manual
	RO	Check RCS temperature stable at or trending to 547 - **NO, cooldown is due to the LOCA and SI flow**
	RO	Verify PZR PORV, spray valves and aux spray valve closed - **YES**
	RO	Check at least one RCP running - **NO**
	BOP	Any S/G pressure decreasing in an uncontrolled manner or completely depressurized - **NO**
	BOP	R-15 and R-19's rad levels normal - **YES**
	RO/BOP	Check for indications of RCS leak - **YES, sump, pressure, temp**
	SRO	Go to PATH-1 Entry point C

Scenario No.: ISS 98-1-SB Event No.: 4 Page 3 of 4

Event Description: LBLOCA PATH-1

Time	Position	Applicant's Actions or Behavior
	SRO	Reset SPDS and monitor CSFST's
		NOTE: **FRP-P.1 entry conditions will be met and the crew should transition. The crew will transition but not implement any actions due to the LBLOCA**
	SRO	Open Foldout "B" and review with the crew
	BOP	Request periodic activity samples of all S/G's
	RO	Check at least one RCP running - **NO**
	BOP	Any S/G depressurizing in an uncontrolled manner or completely depressurized - **NO**
	BOP	Control AFW to maintain S/G level between 10%[20%] and 50%
	BOP	Check for S/G with uncontrolled level increase - **NO**
	BOP	Check R-15 and R-19's rad levels normal - **YES**
	RO	Check PZR PORV's closed and at least one block valve open - **YES**
	SRO	If offsite power is lost, then restart safeguards equipment
	RO	Reset SI, CV spray, and Phase A and B
	RO	Establish instrument air to the CV
	BOP	Check offsite power available to the charging pumps and establish the desired amount of charging flow - **Amount will depend on current PZR level**
	RO	Check CV Spray pumps running - **YES**
	RO	When CV pressure decreases below 4 psig then stop the CV spray pumps and close SI-880 valves - **Stop pumps and close valves**
		NOTE: **When spray pumps are stopped, the AO should report back to the control room that he found RHR-764 closed (If AO was requested to investigate)**

Scenario No.: ISS 98-1-SB Event No.: 4 Page 4 of 4

Event Description: LBLOCA PATH-1

Time	Position	Applicant's Actions or Behavior
	SRO	Provide direction to open RHR-764
	RO	Verify proper RHR flow - **YES**
	RO	Check RCS subcooling > 35 [55] - **NO**
	RO	When below 10 E-10 amps then reenergize the source ranges and transfer the recorders
	RO	Check RCS pressure > 275[400] psig - **NO**
	BOP	Check E-1 and E-2 energized by offsite power - **YES**
	BOP	Check starting air receivers repressurized on the unloaded EDG's
	BOP	Stop the unloaded EDG's
	RO	Verify Supplement "D" components capable of recirc - **YES**
		NOTE: **If the crew never requested the AO to investigate valve lineup, the crew will transition to EPP-15 due to loss of recirc capability**
	BOP	Check Aux building rad levels normal - **YES**
	BOP	Obtain RCS, boron, and H2 samples
	RO	Check RCS pressure > 275[400] psig - **NO**
	RO	Check flow from RHR pumps > 1200 gpm - **YES**
	BOP	Check RWST level > 27%
		NOTE: **If level is not below 27% the crew will be in a loop until this level criteria is met**
	RO	SI system aligned for cold leg recirc - **NO**
	SRO	Transition to EPP-9, "Transition to Cold Leg Recirculation"
		NOTE: **Scenario can be terminated at this point at the evaluator discretion**

Scenario No.: ISS 98-1-SB Event No.: 5 Page 1 of 1

Event Description: Event Classification

Time	Position	Applicant's Actions or Behavior
	ALL SRO's	Classify event as a Site Area Emergency. This is based on RCS leakage > charging pump capacity and two fission product barriers breached

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSED OPERATOR

EXAMINATION SCENARIO

ISS-98-1-SB

PZR SPRAY VALVE FAILURE

RCP VIBRATION

RCP SEAL FAILURE

RCS LEAK

LBLOCA

DEVELOPED BY: ______________________________ DATE __________

APPROVED BY: ______________________________ DATE __________

Supervisor - LOCT

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: ISS-98-1-SB **REV.** 0 **DATE:** ______

SCENARIO NAME: PZR Spray Valve Failure, RCP Vibration, RCP Seal Failure, RCS Leak, LBLOCA

TEAM MEMBERS/INDIVIDUAL EVALUATIONS				EXAMINERS:
CRSS	________________	SAT ___	UNSAT ___	____________________
RO	________________	SAT ___	UNSAT ___	____________________
BOP	________________	SAT ___	UNSAT ___	____________________

OVERALL TEAM EVALUATION: SAT ___ UNSAT ___

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 894 ppm Tavg: 575°F

TARGET VALUE: -2.96 TARGET BAND: ± 5 MWD/MT: 150 RODS: 218D

NORMAL CURRENTS	UPPER	LOWER
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE: HVH-1 , breaker to be replaced this shift, both CV Spray Pumps are operable;

"A" EDG OOS for governor repairs, out for two days, repairs to be completed in two days.

POWER HISTORY: Equilibrium Xenon, No power ramp rate restriction.

EVOLUTIONS IN PROGRESS: CV Pressure Relief in progress IAW OP-921, Section 6.1; maintain current power level.

SCENARIO DESCRIPTION

After shift turnover and allowing the crew to "walkdown" the board, the first event will be a failure of PC-444J which causes a PZR spray valve to open slowly and continuously until the controller is shifted to Manual. PZR pressure will decrease due to the excess spray flow requiring prompt operator action. When the plant has been stabilized, "B" Reactor Coolant Pump will develop high vibrations. These vibrations will cause seal leakoff flows and pump bearing temperatures to increase, indicating a severe problem with the RCP. The RCP vibrations will increase as the crew attempts to decrease power to remove the pump from service. As power is decreased RCS leakage will increase until the RCP shaft binds resulting in an overcurrent trip of the pump and subsequent Loss of Flow trip followed by a LBLOCA in the affected loop. The CV spray will fail to operate automatically requiring operator identification and manual actuation. RHR flow does not occur during large break LOCA due to valve RHR-764 being shut. The operating crew will investigate and have the valve re-opened. The LOCA will require entry into PATH-1 and eventually transition to FRP-P.1. The scenario may be terminated at any time after entry into FRP-P.1 at the discretion of the evaluator(s).

SCENARIO OBJECTIVES

1. Evaluate the crew's response to a failed PZR master pressure controller(PC-444J).
2. Evaluate the crew's response to a RCP vibration alarm IAW AOP-018.
3. Evaluate the crew's response to a RCP #1 seal failure IAW AOP-018.
4. Evaluate the crew's response to a loss of flow trip and LBLOCA IAW PATH-1.
5. Evaluate the crew's response to a failure of CV spray to actuate automatically.
6. Evaluate the crew's response to a lack of RHR flow following a LBLOCA.
7. Evaluate the operator's ability to respond to radiation monitor alarms IAW AOP-005.
8. Evaluate the CRSS's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENT | **COMMENTS**

I. PC-444J FAILURE

A. Enters AOP-019

1. Checks PZR PORV's closed
2. Controls heaters and spray to restore RCS pressure
3. Checks PZR pressure under operator control
4. Checks PC-444J Operating properly in AUTO (RNO)
5. Places 444J in Manual, Controls RCS pressure
6. Implements EAL's
7. Contacts I&C
8. Refers to T.S.

II. RCP SEAL FAILURE

A. Enters AOP-018 Section "B"

1. Checks RCP Bearing and Seal Parameters
2. Checks RCP Standpipe alarms
3. Checks RCP Seal Injection
4. Checks FCV-626 Closed (NO)
5. Checks RCP High Vibration alarms Extinguished (NO)
6. Goes to Section"C"

B. Enters AOP-018 Section "C"

1. Checks for valid alarm

EVENT **COMMENTS**

2. Checks for Trip Criteria
   Crew may determine to trip RX based on procedure interpretation

3. Contacts Tech. Support

4. Monitors RCP Parameters

5. Notifies Mgr - Operations

6. Implements EAL's

7. Refers to T.S.

III. RCS LEAKAGE

A. Respond to RCS leakage IAW AOP-016

1. Checks PZR level

2. Running Charging pumps placed to Max. Speed

3. Checks PZR level

4. Adjusts charging and letdown flow

5. Checks PZR level

6. Isolates Letdown

7. Checks PZR level

8. Establishes Maximum Charging flow

9. Checks PZR level

10. Checks RCS pressure

11. Trip Reactor and Go to Path-1

B. Respond to R2/R7 alarm IAW AOP-005

1. Verify alarm validity

EVENT | **COMMENTS**

2. Evacuate CV

3. Respond to R11/R12 increasing IAW Att. 12

4. Verify alarm validity

5. Verify auto actions

   a. Purge fans stopped

   b. Purge, pressure relief, & vacuum relief valves closed

   CREW IDENTIFIES FAILURE OF CV PRESS RELIEF VALVES TO CLOSE AUTOMATICALLY AND INITIATES ACTION TO CLOSE VALVES.

   - Manually close CV press. relief valves

6. Iodine Removal fans placed in service

7. Notify E&RC to sample and run background checks

8. Goes to AOP-016 or Path-1 if tripped

IV. LBLOCA

A. PATH-1

1. Immediate actions

   a. Verify reactor tripped

   b. Verify turbine tripped

   c. E-1 & E-2 energized

   d. Verify SI initiated

EVENT **COMMENTS**

2. Subsequent actions

   a. Opens Foldout A

   b. Verify Phase A valves closed

   c. Verify FW isolation

   d. Verify both FW pumps tripped

   CREW IDENTIFIES AUTO-START FAILURE OF MDAFWPs AND MANUALLY ESTABLISHES AT LEAST 300 GPM AFW FLOW.

Crew may identify "B" S/G is faulted due to large delta P and decreasing pressure

   e. Verify both MDAFW pumps running

   f. Start SDAFW pump as necessary

   g. Verify two SI pumps running

   h. Verify both RHR pumps running

   i. SI valves properly aligned

   j. At least 1 CCW pump running

   k. All SW & SW booster pumps running

   l. Verify HVH 1-4 running

   m. Verify IVSW system initiated

   n. Verify CV ventilation isolation

   o. Verify CR ventilation aligned for pressurization mode

   p. Verify both EDG's running

EVENT	COMMENTS
*q. Restart battery chargers within 30 min	

EVENT | **COMMENTS**

r. CV pressure remained <20 psig - **NO**

CREW STARTS AT LEAST ONE CV SPRAY PUMP AND OPENS APPROPRIATE 880 VALVES.

(1) Manually initiate CV spray

(2) Verify phase B isolation valves closed

(3) Trip all RCP's

s. Auto steam line isolation initiated or required

3. Subsequent actions

a. Checks for SI flow

b. Checks for RHR flow - **NO FLOW**

CREW RECOGNIZES NO RHR FLOW AND TAKES ACTIONS TO RESTORE FLOW.

(1) Directs AO to check RHR lineup

c. Check AFW flow

d. Check PORV's, spray and aux spray valves closed

e. Check RCP trip criteria

f. Check for faulted or ruptured SG

g. Check CV pressure normal

B. Entry Point "C" on PATH-1

1. Reset SPDS and monitor CSFST's

2. Enter FRP-P.1 due to depressurization

EVENT	COMMENTS
and cooldown	
C. SS assumes SEC position	
1. SEC classifies event as Site Area Emergency (RCS leakage > makeup capability OR leakage > 50 gpm and path from CV to environment)	
2. SEC implements EP's	

INITIAL CONDITIONS/TURNOVER INFORMATION:

POWER LEVEL: 100% BORON: 894 ppm Tavg: 575°F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

NORMAL CURRENTS	UPPER	LOWER
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm. 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE: HVH-1, breaker to be replaced this shift, both CV Spray Pumps are operable

"A" EDG OOS for governor repairs, out for two days, repairs to be completed in two days.

POWER HISTORY: Equilibrium Xenon, No power ramp rate restriction.

EVOLUTIONS IN PROGRESS: CV Pressure Relief in progress IAW OP-921, Section 6.1; maintain current power level.

EXAM INSTRUCTIONS

TIME	SIMULATOR OPERATION	SUPPLEMENTAL INFO
T-0	Init to IC - 5	
	Turn HVH-1 OFF at RTGB	HVH-1 OOS
	OPEN V12-10, V12-11 with RTGB switch	CV Pressure Relief in progress
	IFP ACNMA to 140,000, Insert fixed parameter to increase CV air mass	Increase CV pressure to .75 psig
	ORI XDDI087 OPEN, From Panel Mimics Override V12-10, 11 Switch to OPEN	V12-10, 11 fail to close on R-11/R-12 alarm or SI. Valves will be able to be closed with RTGB switch by removing override
	CORDS PI:953, 0	Plugged sensing line (will inhibit auto spray actuation)
	CORDS PI:955, 0	Plugged sensing line (will inhibit auto spray actuation)
	RFI EPS133 RACK_OUT HVH-1 breaker racked out (E-1)	HVH-1 OOS. PUT "RED CAP" ON RTGB SWITCH
	RFI CFW083 NO_AUTO "A" MDAFWP Auto-start inhibit	MDAFWP auto-start failure
	RFI CFW084 NO_AUTO "B" MDAFWP Auto-start inhibit	MDAFWP auto-start failure
	RFI RHR009 0 RHR-764 to shut	RHR-764 out of position - shut
	MFI CFW01C: ACT, 0	SDAFWP Trips
	MFI EDG01A: ACT, 0 TD	"A" EDG OOS
	RFI EPS120 RACK_OUT "A" EDG output breaker racked out(E-1)	"A" EDG OOS, RED cap on RTGB

CONTINUED ON NEXT PAGE

TIME	SIMULATOR OPERATION	SUPPLEMENTAL INFO
T≈3	ORP XAAA085A PC-444J, 60% 35 sec. ramp, 0 TD	PC-444J controller malfunction opens spray valve
T≈12	MFI RCS13B: 1.0 gpm, 300 sec ramp	RCP "B" #1 seal failure, gives ≈ 5.5 gpm seal leakoff
	MFI RCS16B: 15.5 mils, 420 sec ramp	RCP "B" high vibrations. Insert at same time as RCP "B" seal failure inserted above
T-V	MFI RCS09C: RCS leak, 300 gpm, 480 sec ramp	RCS leakage, insert after operators have entered AOP-018, section C for high vibrations
INSERT THE NEXT MALF (RCS02B) <u>PRIOR</u> TO OPERATORS TRIPPING RX		
T-V	MFI RCS02B: OC, 2 sec. TD,	"B" RCP trips prior to operators tripping RX per AOP-018
INSERT THE NEXT ACTION (DELETE V12-10/11 OVERRIDE) AT THE SAME TIME THE OPERATOR ATTEMPTS TO CLOSE V12-10/11 FROM THE RTGB SWITCH		
T-V	**Delete override on CV pressure relief switch** DOR XDDI087	Allows V12-10/11 valves to close when operator goes to CLOSE on RTGB switch
INSERT THE NEXT MALF (RCS01C) FOLLOWING AOP-016 ACTIONS OR PLANT TRIP		
T-V	MFI-RCS01C: 100%, 10 sec. ramp	Large Break LOCA
T-V	RFI RHR009 764 open	Report as AO that RHR-764 is shut after being directed to walkdown RHR valve lineup. Open valve if directed by control room.

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO NUMBER: ISS-98-1-SB

Qualitative Attributes

____ 1. The scenario has clearly stated objectives.

____ 2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but does not cue the crew into expected events.

____ 3. The scenario consists mostly of related events.

____ 4. Each event description consists of:

- the point in the scenario where each event is initiated
- the malfunctions that are entered to initiate the event
- the symptoms/cues that will be visible to the crew
- the expected operator actions (by shift position)
- the event termination point

____ 5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding event (such as a seismic event)

____ 6. The events are valid with respect to thermodynamics and physics

____ 7. Sequence and timing of events is reasonable and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives

____ 8. The scenario modeling is not altered

____ 9. All crew competencies can be evaluated

____ 10. Scenario has been validated by the individuals listed below (should be operating crew if possible):

____ 11. If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.

SIMULATOR SCENARIO REVIEW CHECKLIST
(cont.)

Quantitative Attributes

NOTE: The following criteria lists scenario traits that are numerical in nature. The second set of numbers indicates a range to be met for a set of two scenarios. Therefore, to complete this part of the review, the set of scenarios must be available. This page should be completed once per scenario set.

SCENARIO SET CONSISTS OF DSS-009 AND DSS-____

__8__ /____ 12. Total malfunctions: 4-8 / 10-14

__4__ /____ 13. Malfunctions AFTER EOP entry: 1-4 / 3-6

__2__ /____ 14. Abnormal events: 1-2 / 2-3

__2__ /____ 15. Major transients: 1-2 / 2-3

__1__ /____ 16. EPPs used beyond Path-1: 1-3 / 3-5

__0__ /____ 17. EOP Contingency Procedures used: 0-3/1-3

≥45 /___ 18. Approximate scenario run time: 45-60 min. (one scenario may approach 90 min.)

≥40 /___ 19. Emergency procedure run time: 40-70% of scenario run time

__YES__ 20. Technical Specifications are exercised during the test

COMMENTS:

____

____

____

____

REGION II
LICENSE EXAMINATION

ADMIN QUESTIONS

SRO

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

SRO ADMIN A.1
QUESTION # 1

REFERENCE ALLOWED: __X__ / ______
yes no

Question: Given the following conditions:

- MODE 1, 100%
- HCV-121, CHARGING FLOW is bypassed and under clearance for corrective maintenance on the actuator
  - ⇒ CVC-202A, HCV-121 OUTLET closed
  - ⇒ CVC-202B, HCV-121 INLET closed
  - ⇒ CVC-309A, HCV-121 BYPASS open
- LT-460 failed low ~ 20 minutes ago, actions IAW AOP-025 have been taken
- The RO is establishing Letdown IAW OP-301-1 (see attached)

Describe the actions required to satisfy step 8.4.4.1.g of OP-301-1.

Answer:
[.33] The RO should identify HIC 121 is bypassed and can not be opened
[.33] The CRSS / SSO determines the step may be marked N/A and initials in the INIT space beside the N/A
[.33] Reason for marking the step N/A & step number noted in the Comments section

CANDIDATE'S RESPONSE

____

____

____

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____

Time: 5 min.

K/A Rating: Gen 2.1.20 4.3/4.2

References: OMM-001-15, section 5.4.3.5

SRO ADMIN A.1
QUESTION # 2

REFERENCE ALLOWED: ______ / __X__
yes no

Question: While independently verifying a valve lineup on "C" Charging Pump, the Inside Auxiliary Operator discovers CVC-267, "C" Charging Pump suction valve is CLOSED instead of OPEN.

What action(s) should be taken?

Answer: The IAO should immediately contact the CRSS or SSO for resolution

CANDIDATE'S RESPONSE

____

____

____

____

____

Time: 3 min.

K/A Rating: Gen, 2.1.29 3.4/3.3

References: PLP-030, Independent Verification

SRO ADMIN A.1
QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: _____ / __X__
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: While independently verifying a valve lineup on "C" Charging Pump, the Inside Auxiliary Operator discovers CVC-267, "C" Charging Pump suction valve is CLOSED instead of OPEN.

What action(s) should be taken?

SRO ADMIN A.1
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- MODE 1, 100%
- HCV-121, CHARGING FLOW is bypassed and under clearance for corrective maintenance on the actuator
  - ⇒ CVC-202A, HCV-121 OUTLET closed
  - ⇒ CVC-202B, HCV-121 INLET closed
  - ⇒ CVC-309A, HCV-121 BYPASS open
- LT-460 failed low ~ 20 minutes ago, actions IAW AOP-025 have been taken
- The RO is establishing Letdown IAW OP-301-1 (see attached)

Describe the actions required to satisfy step 8.4.4.1.g of OP-301-1.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM-CR-059

Calculate RCS Leakage IAW OST-051

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Calculate RCS leakage
002*001*R2*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-059 Rev. 4
RO / SRO

K/A Rating(s):

Gen 2.1.20	4.3/4.2
Gen 2.1.23	3.9/4.0

Task Standard:

Calculate RCS leak rate IAW OST-051 within 0.2 gpm.

Preferred Evaluation Location:

Simulator

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation

Validation Time: 15 min. **Time Critical:** No

Candidate: ______________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT _____ UNSAT _____

Performance Time: ________

Examiner: ________________________ ____________________________/_______
NAME SIGNATURE DATE

COMMENTS

Step 6
Critical because operator action required to prevent leak-by past LCV-115A from invalidating the surveillance

Step 7
Critical because operator must obtain correct data to perform calculation

Step 9
Critical because operator action is required to restore LCV-115A to Auto and obtain correct data to perform calculation

Step 10
Critical because operator must perform the calculations

Step 11
Critical because operator must perform the calculations

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-5. Go to RUN, allow plant conditions to stabilize, then place the simulator in FREEZE.
2. Go to RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED RCS Leakage Evaluation:

When I tell you to begin, you are to perform an RCS Leakage Evaluation IAW OST-051. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant is at 100% power.
2. You are the Reactor Operator.

INITIATING CUES:

The CRSS directs you to perform OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OST-051. **EXAMINER'S CUE: Hand the operator the copy of the procedure after he/she locates it. Inform him/her the revision status has been checked and is current and the SSO's permission to conduct this test has been granted.** COMMENTS:	____ SAT ____ UNSAT
STEP 2: RCS temperature is stable There is a bubble in the Pressurizer (Steps 3.3, 3.4) STANDARD: Operator determines RCS temperature is stable and there is a bubble in the PZR. COMMENTS:	____ SAT ____ UNSAT
STEP 3: RCS pressure is stable Record RCS pressure Record Plant Mode (Step 3.5, 3.6, 3.7) STANDARD: Operator determines RCS pressure is stable at ~ 2235 psig and plant is in Mode 1 COMMENTS:	____ SAT ____ UNSAT
STEP 4: Verify RCS MAKEUP MODE in the AUTO position. (Step 7.1.1) STANDARD: RCS Makeup switch positioned to AUTO. COMMENTS:	____ SAT ____ UNSAT

STEP 5: Verify RCS MAKEUP SYSTEM in the START position. (Step 7.1.2) STANDARD: RCS Makeup System positioned to START as indicated by red indicating light illuminated on the RCS Makeup Control switch. COMMENTS:	____ SAT ____ UNSAT
STEP 6: Place LCV-115A, VCT/HLDP TK DIV in the VCT position. (Step 7.1.3) STANDARD: LCV-115A positioned to VCT as indicated by the white VCT light illuminated on the RTGB. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Whenever possible, use the ERFIS computer for data collection. This will improve accuracy and reduce the potential for human error.
The ERFIS on-screen historic information may be used to assist with data collection. This is especially helpful during a xenon transient or when in AOP-016.

STEP 7: Record the Initial Values for the parameters listed on Attachment 8.1 (Step 7.1.4) STANDARD: Operator obtains / records values and time. (ERFIS should be used for all values except RCS Drain Tank and Charging Pump Leak-off Collection Tank). **EXAMINER NOTE: See attached completed Attachment 8.1.** **BOOTH INSTRUCTOR'S CUE: When requested, report LI-1003 indicates 15%.** **When requested, report LIC-200 indicates 50%.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: IF an automatic makeup occurs, THEN perform the following: (Step 7.1.5.1 & 2) 1. Place LCV-115A, VCT/HLDP TK DIV, in the AUTO position. 2. Stop this procedure AND note reason in Comments section. STANDARD: Operator maintains steady plant conditions for duration of test. COMMENTS:	____ SAT ____ UNSAT

NOTE: When this procedure is being performed to satisfy ITS SR 3.4.13.1, the preferred duration is ≥ 1 hour and the minimum duration is 15 minutes.
When this procedure is being performed as directed by an AOP, there is not a minimum time duration requirement.

EXAMINER'S CUE: **Inform operator that 1 hour has passed and to continue with the test.** **In order to ensure data repeatability for final calculation, CUE the operator with the final values listed below:** • **VCT Level .... 2 inches less than initial value** • **PZR Level .... same as initial value** • **RCS Temp.................. same as initial value** • **PZR RELIEF TANK .....same as initial value** • **Accumulators A, B, C ....same as initial value** • **LI-1003: when operator calls Inside AO, report 17%.** • **LIC-200: when operator calls Inside AO, report same as initial value** STEP 9: WHEN at least 1 hour has elapsed, OR, IF required by Plant conditions to end this test, THEN perform the following: (Step 7.1.6.1., 2 & 3) 1. Verify RCS temperature is equal to initial RCS temperature recorded on Attachment 8.1. 2. Record the Final Values for the parameters listed on Attachment 8.1. 3. Place LCV-115A, VCT HLDP TK DIV, in the AUTO position. STANDARD: 1. RCS temperature verified equal to initial reading. 2. Final values recorded on Attachment 8.1 3. LCV-115A positioned to Auto as indicated by the white AUTO light light illuminated above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: A decrease in VCT level represents plus (+) RCS leakage.
A decrease in Pressurizer level represents plus (+) RCS leakage.

STEP 10: Calculate the Difference and Change In Volume for the parameters listed on Attachment 8.1 (Step 7.1.7) STANDARD: Operator completes the Difference and Change In Volume calculations as directed on Attachment 8.1 **EXAMINER NOTE: See attached completed Attachment 8.1.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: A plus (+) calculated Total RCS Leakage Rate represents plus (+) RCS leakage.

STEP 11: On Attachment 8.2, perform the following: (Step 7.1.8.1., 2., & 3) 1. Calculate the Total RCS Leakage Rate 2. Calculate the Identified RCS Leakage Rate. 3. Calculate the Unidentified RCS Leakage Rate. STANDARD: Operator completes the Total, Identified and Unidentified leakage calculations as directed on Attachment 8.2. **EXAMINER NOTE: See attached completed Attachment 8.2.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 12: IF RCS unidentified leakage is ≥ .34 gpm, THEN contact E&C Technician to perform Primary to Secondary Leakage Calculation for each steam generator IAW CP-014. [ITS LCO 3.4.13.e] (Step 7.1.9) STANDARD: Operator determines unidentified RCS leakage > .34 gpm and contacts E&C Technician. **BOOTH INSTRUCTOR CUE: If called, respond as the E&C Technician and acknowledge request to perform Primary to Secondary Leakage Calculation IAW CP-014.** **EXAMINER NOTE: See attached completed Attachment 8.2.** COMMENTS:	____ SAT ____ UNSAT

STEP 13: If unidentified RCS leakage is ≥ 1 gpm OR the identified RCS leakage is > 10 gpm, THEN perform the following: (Step 7.1.10.1., 2., 3., & 4) 1. Consult ITS LCO 3.4.13 for required actions. 2. Consult AP-030 for reporting requirements. 3. Consult EPCLA-00 for emergency action levels. 4. Consult AOP-016 for required actions. STANDARD: Operator determines unidentified RCS leakage < 1 gpm and identified RCS leakage < 10 gpm. Actions 7.1.10.1 thru 4 marked N/A. **EXAMINER'S CUE: If asked, this surveillance was scheduled for performance.** **EXAMINER NOTE:** **SURVEILLANCE TEST PROCEDURE CERTIFICATION AND REVIEW FORM:** **The operator should circle "Scheduled"** **Complete the "Test Performed By:" and "Test Complete" sections.** **Test Satisfactory should be circled "YES"** COMMENTS: **END OF TASK**	____ SAT ____ UNSAT

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Plant is at 100% power.
2. You are the Reactor Operator.

INITIATING CUES:

The CRSS directs you to perform OST-051, Reactor Coolant System Leakage Evaluation (Every 72 hours During Steady State Operation and Within 12 hours After Reaching Steady State Operation

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM-ADM-006

Event Notification on the Electronic Display System

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the actions of the Emergency Communicator IAW EPNOT01 and EPCLA01
085*004*R1*04

Alternate Path:

N/A

Facility JPM #:

JPM ADM-006 Rev. 0
RO / SRO

K/A Rating(s):

2.4.38 2.2/4.0
2.4.43 2.8/3.5

Task Standard:

Emergency Notification Form completed within 13 minutes (see attached completed form)

Preferred Evaluation Location:

Simulator

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EPNOT-01, CR/EOF Emergency Communicator

Validation Time: 10 min. **Time Critical:** YES (13 minutes)

Candidate: ____________________________
NAME

	Overall Time	Critical Time
Start:	________	________
Finish:	________	________
Performance Time (min):	________	________

Examiner: ____________________ ____________________ / ________
NAME SIGNATURE DATE

COMMENTS

Time Critical because notification to the State and County agencies is required within 15 minutes of event classification[1]

Step 3
Critical because operator must log on to EDS using a SSO / CRSS position

Step 4
Critical because an event must be declared in EDS for the first notification

Step 5
Critical because the operator must fill out the electronic form

Step 7
Critical because SEC approval must be obtained and the form electronically faxed to offsite agencies

Step 8
Critical because the operator must make contact with the offsite agencies

Step 11
Critical because operator must document first voice contact with offsite agencies to satisfy 15 minute time requirement

[1] 10 CFR 50 Appendix E, (IV)(D)(3)

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-223 (from IC-5)
2. Place the simulator in RUN long enough to set up the SSO ERFIS Monitor "SPTOP", then back to FREEZE
3. Update the Control Room Status Board to IC-5 Chemistry Sheet.
4. Place the simulator in RUN when directed by the examiner.

Tools/Equipment/Procedures Needed:

EPNOT-01, CR/EOF Emergency Communicator

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Event Notification:

When I tell you to begin, you are to perform the actions of the Control Room Emergency Communicator up to and including contacting State and County agencies. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant was at 100%
2. 10 minutes ago, a SBLOCA occurred which caused a reactor trip and SI actuation
3. 2 minutes ago, the SSO declared a Site Area Emergency based on RCS leakage > Charging capability

INITIATING CUES:

1. You have been directed to perform the duties of the Emergency Communicator up to and including contacting State and County agencies.
2. The crew is responding to the event.

START TIME: ___________ TIME CRITICAL START TIME: _______

STEP 1:	Staff the Emergency Communicator function as follows: (Step 8.1.3.1) a. Control Room – 1 Emergency Communicator – 1 SPDS Communicator if ERFIS OOS or as desired	____ SAT ____ UNSAT
STANDARD:	Operator staffs the Control Room Emergency Communicator position as stated in the Initiating Cue.	
COMMENTS:		
STEP 2:	If the Electronic Display System (EDS) is not operable: (Step 8.1.3.2) a. Complete emergency notification forms manually and fax forms using a stand alone fax machine.	____ SAT ____ UNSAT
STANDARD:	Operator determines EDS is operable	
COMMENTS:		
STEP 3:	If EDS is operable, log on to the system. (Step 8.1.3.3) a. Control Room staff should use the Superintendent Shift Operations (SSO) position login for appropriate access to forms and approval authority.	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Operator logs on to EDS F3 → EP Functions → Login (SSO and name)	
COMMENTS:		
STEP 4:	For first notification only, declare an event on EDS. (Step 8.1.3.4)	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Operator declares an event on EDS	
COMMENTS:		

STEP 5: Complete the Emergency Notification Form. (Step 8.1.3.5) a. Instructions for completing the manual form are included as an Attachment 8.1.5.1 to this procedure. b. For electronic forms, avoid placing the cursor in the approval section of the form prior to actual approval of the form. Premature approval will not allow any SEC/ERM comments to be incorporated without clearing the entire form. STANDARD: a. Operator determines EDS is operable, manual instructions not required. b. Operator avoids placing the cursor in the approval section of the electronic form. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 6: If time allows, during SEC/ERM notification form approval, begin working on completing information required to initiate Dialogic. (Step 8.1.3.6) STANDARD: Operator acknowledges that someone else has been assigned to perform Dialogic activation **EXAMINER CUE: Another individual has been assigned Dialogic activation** COMMENTS:	____ SAT ____ UNSAT
STEP 7: Obtain SEC/ERM approval for information on the emergency notification form and fax to offsite agencies. (Step 8.1.3.7) STANDARD: Notification form is faxed to offsite agencies. **EXAMINER'S CUE: Inform the operator SEC approval obtained and direct him/her to approve the notification** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 8:	Transmit notification form to offsite agencies: (Step 8.1.3.8.a) a. Use Selective Signaling System, or – Dial A1 on Selective Signaling phone to simultaneously conference all parties. – The press-to-talk bar must be depressed for other personnel to hear your voice. – The external speaker is active for the first 10 seconds after a call is placed. Any sounds or conversation will be transmitted over the external speaker to offsite phones.	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Operator picks up the Selective Signaling System phone and dials A1	
COMMENTS:		
STEP 9:	Notifications are required within: (Step 8.1.3.8.c) – 15 minutes of an initial classification, or – 30 - 60 minutes for a follow up notification	____ SAT ____ UNSAT
STANDARD:	Operator makes initial notification within 15 minutes	
COMMENTS:		
STEP 10:	Conduct a roll call by agency to determine locations on line. (Step 8.1.3.8.d) – Roll call is to determine that at least one representative from each agency is on line.	____ SAT ____ UNSAT
STANDARD:	Operator determines all State and County agencies are on line by depressing the press-to-talk button and calling for each agency: 1. State of South Carolina 2. Darlington County 3. Lee County 4. Chesterfield County	
BOOTH INSTRUCTOR CUE:	**When called on the Selective Signaling System , respond as follows:** **State of South Carolina Warning Point** **Darlington County Emergency Operations Center** **Lee County Emergency Operations Center** **Chesterfield County Emergency Operations Center**	
COMMENTS:		

STEP 11:	Document time of first voice contact and place a check next to locations contacted (i.e., items 1-4) on page 2 of the Notification Form (Attachment 8.1.5.1). (Step 8.1.3.8.e)	**CRITICAL STEP**
STANDARD:	Operator documents time of 1st voice contact in the appropriate blank and places a check in the following blanks: State of South Carolina Warning Point Darlington County EOC Lee County EOC Chesterfield County EOC	____ SAT ____ UNSAT
COMMENTS:		
	END OF TASK	

TIME CRITICAL STOP TIME: ______________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The plant was at 100%
2. 10 minutes ago, a SBLOCA occurred which caused a reactor trip and SI actuation
3. 2 minutes ago, the SSO declared a SAE based on RCS leakage > Charging capability

INITIATING CUES:

You have been directed to perform the duties of the Emergency Communicator up to and including contacting State and County agencies.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM-ADM-007

Initiate an Equipment Clearance

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Manually Prepare and Issue an LCTR IAW NGGC-1301
119*012*R3*01

Alternate Path:

N/A

Facility JPM #:

JPM ADM-007 Rev. 0
RO / SRO

K/A Rating(s):

2.2.13 3.6/3.8

Task Standard:

Initiate an Equipment clearance on the "A" Condensate Pump IAW OPS-NGGC-1301, Equipment Clearance.

Preferred Evaluation Location:

This JPM can be performed anywhere P&IDs and EDPs are located

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EDP-001, 4160V AC Busses
EDP-007, Power Panels
P&ID G-190197, sheet 2

Validation Time: 20 min. **Time Critical:** No

Candidate: ________________________________ Time Start: _________
NAME Time Finish: _________

Performance Rating: SAT ______ UNSAT ______ Performance Time: _________

Examiner: ________________________ ______________________________/_______
NAME SIGNATURE DATE

Tools/Equipment/Procedures Needed:

P&IDs
EDPs

EXAMINER'S NOTE: **This JPM consists of initiating an Equipment Clearance on "A" Condensate Pump. See completed attachments:**

- **Attachment 1, Clearance Log Sheet**
- **Attachment 3, Operations Clearance Form**
- **Attachment 4, Operations Clearance Tag Sheet**

The highlighted (yellow) information is required to satisfactorily accomplish this task. Additionally, the asterisks (red) indicate the correct sequence for hanging the tags on specific components.

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Initiate an Equipment Clearance:

When I tell you to begin, you are to initiate an equipment clearance. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant is stable at 35% power
2. "A" Condensate Pump was secured due to excessive vibration
3. Mechanical Maintenance has submitted a Clearance Request to replace "A" Condensate Pump

INITIATING CUES:

Initiate an equipment clearance on "A" Condensate Pump up to but not including writing tags for the required components.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The plant is stable at 35% power
2. "A" Condensate Pump was secured due to excessive vibration
3. Mechanical Maintenance has submitted a Clearance Request to replace "A" Condensate Pump

INITIATING CUES:

1. Initiate an equipment clearance on "A" Condensate Pump up to but not including writing tags for the required components.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM-ADM-008

Approve an Equipment Clearance

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Authorize Local Clearance and Test Requirements IAW OMM-005
341*054*R3*02

Alternate Path:

N/A

Facility JPM #:

JPM ADM-008 Rev. 0
SRO

K/A Rating(s):

2.2.13 3.6/3.8

Task Standard:

Review / approve equipment clearance on the "B" EHC Unloader Filter Bank. Correct power supply, valve positioning sequence, and add Special Instructions prior to approval.

Preferred Evaluation Location:

This JPM can be performed anywhere P&IDs and EDPs are located

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

EDP-003
P&ID

Validation Time: 15 min. **Time Critical:** No

Candidate: ________________________________ Time Start: __________
NAME Time Finish: __________

Performance Rating: SAT ______ UNSAT ______ Performance Time: __________

Examiner: ________________________ ______________________________/________
NAME SIGNATURE DATE

Tools/Equipment/Procedures Needed:

P&IDs
EDPs

EXAMINER'S NOTE: **This JPM consists of approving an Equipment Clearance on the "B" EHC Unloader Filter Bank. See completed attachments:**

- **Attachment 1, Clearance Log Sheet**
- **Attachment 2, Clearance Request Form**
- **Attachment 3, Operations Clearance Form**
- **Attachment 4, Operations Clearance Tag Sheet**

This clearance can not be approved as written for the following reasons:

- **Tag 02: Power supply is wrong ... should be MCC-3 (2J)**
- **Tags 03 & 04 hanging sequence is wrong ... should isolate discharge prior to suction valve**
- **This clearance requires Special Instructions due to:**
  - **no double valve isolation (9.2.1.13)**
  - **no drain path available (9.2.1.23)**

After the operator makes the above corrections, he/she should sign & date the Authorized By SRO blank.

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Initiate an Equipment Clearance:

When I tell you to begin, you are to review / approve an equipment clearance. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant is at 100% power
2. Maintenance has requested an equipment clearance on the "B" EHC Unloader Filter Bank.
3. The PTR PLUS Clearance computer is not in service.

INITIATING CUES:

Review / approve an equipment clearance on the "B" EHC Unloader Filter Bank.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The plant is at 100% power
2. Maintenance has requested an equipment clearance on the "B" EHC Unloader Filter Bank.
3. The PTR PLUS Clearance computer is not in service.

INITIATING CUES:

Review / approve an equipment clearance on the "B" EHC Unloader Filter Bank.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM-ADM-009

Approve a Liquid Waste Release Permit (Batch Release)

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Approve Radioactive Waste Discharge/Release Permits
341*012*R3*02

Alternate Path:

N/A

Facility JPM #:

JPM ADM-009 Rev. 0
SRO

K/A Rating(s):

2.3.6 2.1/3.1

Task Standard:

Determine that this release permit can not be approved as written.

Preferred Evaluation Location: This JPM can be performed anywhere

Preferred Evaluation Method: Perform _____ Simulate __X__

References:

EMP-023, Liquid Waste Release and Sampling

Validation Time: 20 min. **Time Critical:** No

Candidate: ______________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

Tools/Equipment/Procedures Needed:

EMP-023, Liquid Waste Release and Sampling
Completed EMP-023, Attachment 10.3 (hand-written)
- "A" Monitor Tank
- Unit 1, both Circ Pumps used for Dilution Flow
- E&C Supervisor signature N/A'd for Release Approval

EXAMINER'S NOTE: **This JPM consists of reviewing a Liquid Waste Release Permit. The operator should NOT approve the permit based on the following discrepancies (see attached):**
- **Unit 1 used for dilution flow without the required official letter attached**
- **Wrong dilution flow ... should be 80,000 gpm for 2 Unit 1 Circ Pumps**
- **E&C Supervisor Release Approval required due to 10CFR50 Quarterly Limit (Total Body) exceeded 50%**

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED Liquid Waste Release Permit Approval:

When I tell you to begin, you are to review/approve a Liquid Waste Release Permit. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Unit 1 is at 100 MWe
2. Unit 2 is at 100%
3. Lake Robinson temperature is 86°F

INITIATING CUES:

E&RC has sampled the "A" Monitor Tank and requests approval for the Liquid Waste Release Permit. You are the Superintendent-Shift Operations. You are to review / approve the Release Permit IAW appropriate station procedures.

CAROLINA POWER AND LIGHT COMPANY
ROBINSON S.E.G PLANT
LIQ PROC NAME
Liquid Radioactive Release Permit
Pre-Release Supplementary Data

9900XX-L

PART I: PRE-RELEASE DATA

RELEASE POINT (2): MONITOR TANKS A / B
DISCHARGE POINT (1): WASTE DISPOSAL SYSTEM
Dilution Stream (1): DISCHARGE CANAL

Permit Issued: TODAY

Release Type: Batch

Waste Tank Volume: 1.0000E+04 GAL
Recirc. Start: TODAY 01:00:00
Sample After: TODAY 02:01:00

Recirc. Rate: 6.0000E+01 GPM
Min Recirc Time: 61 MIN
Agitator Used:

Rad Monitor: ( ) R-18
Rad Monitor Bckgrnd: 1.1200E+04 CPM

( ) N/A
0.0000E+00

Estim. Dilution Flow: 4.0000E+05 GPM
Estim. Dilution Vol.: 1.0000E+08 GAL
Dilution Factor (Act): 2.5010E+03
Estim. Release Start: TODAY
Estim. Release End: TODAY

Estim. Waste Flow: 4.0000E+01 GPM
Estim. Waste Vol.: 1.0000E+04 GAL
Estim. Duration: 250.00 MIN

PART II: PRE-RELEASE CALCULATIONS

Sample Entry # : 204
Sample time:
Configuration File Name: N/A

Sampled by:

Total Waste Activity: 4.4668E+01 Curies
Total Waste Conc/ECL: 1.1800E+03
Dilution Allocation: 2.5000E-01
Min Dilution Flow: 3.7745E+05 GPM
Dilution Strm Sample: 0
Max Monitor Setpoint: 1.4009E-02 uCi/ml
3.8217E+06 CPM

Total Waste Conc: 1.1800E+00 uCi/ml
Total Gamma Conc: 4.0752E-06
Concurrent Releases: 1
Max Waste Flow: 4.0000E+01 GPM
Dilution Conc/ECL: 4.7182E-01
Flag:
Rqrd Dilution Fct: 2.3600E+03

Setpoint data for other dilution flow rates:

Dilution (GPM)	Max Waste (GPM)	Setpoint (uCi/ml)	Setpoint (CPM)	Flag
5.0000E+04	5.2987E+00	0.0000E+00	1.1200E+04 (MAX)	F
1.6000E+05	1.6956E+01	0.0000E+00	1.1200E+04 (MAX)	F
2.5000E+05	2.6494E+01	0.0000E+00	1.1200E+04 (MAX)	F
4.0000E+05	4.2390E+01	1.4009E-02	3.8217E+06 (MAX)	

Flags: F- Waste Flow > Max Allowable

ISOTOPIC IDENTIFICATION - Unit 2

ISOTOPE		Pre-Dilut Measured uCi/ml	Pre-Dilut Measured Conc/ECL	Pre-Dilut Measured Conc/Total	Post Dilution uCi/ml	Post Dilution Conc/ECL	Estimated Curies Released
CO-57	P	1.12E-08	1.87E-04	9.49E-09	4.48E-12	7.46E-08	4.24E-07
FE-55	O	4.13E-07	4.13E-03	3.50E-07	1.65E-10	1.65E-06	1.56E-05
H-3	O	1.18E+00	1.18E+03	1.00E+00	4.72E-04	4.72E-01	4.47E+01
XE-133	N	4.06E-06	2.03E-02	3.44E-06	1.62E-09	8.12E-06	1.54E-04
Totals		1.18E+00	1.18E+03		4.72E-04	4.72E-01	4.47E+01

Dose Calculation by Isotope (mrem) from This Release — Unit 2

Isotope	:Bone	:Liver	:Tot-body	:Thyroid	:Kidney	:Lung	:GI-LLI
CO-57	:4.73E-11	:1.35E-10	:2.10E-10	:4.73E-11	:4.73E-11	:4.73E-:11	:2.53E-09
FE-55	:1.13E-07	:7.84E-08	:1.83E-08	:0.00E+00	:0.00E+00	:4.37E-08	:4.50E-08
H-3	:0.00E+00	1.11E-01:	:1.11E-01	:1.11E-01	:1.11E-01	:1.11E-01	:1.11E-01
Totals	:1.13E-07	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02	:1.11E-02

CAROLINA POWER AND LIGHT COMPANY
ROBINSON S.E.G PLANT
LIQ PROC NAME
Liquid Radioactive Release Permit
Pre-Release Supplementary Data

9900XX-L

Report Category	:	Cumulative Maximum Individual Dose (mrem) for
	:	Controlling Age Group at Controlling Location
Type of Activity	:	Radioiodines and Particulates
Age Group & Pathway(s)	:	Adult . sff wr
Location	:	NE at 6.760 km.
Unit number	:	2

	Bone	Liver	Tot-body	Thyroid	Kidney	Lung	GI-LLI
This Release	1.13E-07	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02
31D Prior To Rel	3.42E-07	3.42E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03
31D After Release	4.56E-07	1.45E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02
31 Day Limit	2.00E-01	2.00E-01	6.70E-02	2.00E-01	2.00E-01	2.00E-01	2.00E-01
% 31 Day Limit	0.00%	7.26%	21.46%	7.20%	7.20%	7.20%	7.20%
Qtr Prior To Rel	6.06E-06	6.89E-01	7.54E-01	1.86E+00	1.86E+00	1.86E+00	1.86E+00
Qtr After Release	6.18E-06	7.00E-01	7.66E-01	1.88E+00	1.88E+00	1.88E+00	1.88E+00
Quarterly Limit	5.00E+00	5.00E+00	1.5E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
% Quarter Limit	0.00%	14.00%	51.04%	37.63%	37.63%	37.63%	37.63%
Ann Prior To Rel	8.92E-05	9.86E-01	7.88E-01	2.18E+00	2.18E+00	2.18E+00	2.18E+00
Ann After Release	8.93E-05	9.97E-1	7.99E-01	2.19E+00	2.19E+00	2.19E+00	2.19E+00
Annual Limit	1.00E+01	1.00E+01	3.00E+00	1.00E+01	1.00E+01	1.00E+01	1.00E+01
% Annual Limit	0.00%	9.97%	26.63%	21.90%	21.90%	21.90%	21.90%

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Unit 1 is at 100 MWe
2. Unit 2 is at 100%
3. Lake Robinson temperature is 86°F

INITIATING CUES:

E&RC has sampled the "A" Monitor Tank and requests approval for the Liquid Waste Release Permit. You are the Superintendent-Shift Operations. You are to review / approve the Release Permit IAW appropriate station procedures.

REGION II
LICENSE EXAMINATION

ADMIN QUESTIONS

RO

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ____________________ Date: ______________

RO ADMIN A.1
QUESTION # 1

REFERENCE ALLOWED: __X___ / ______
yes **no**

Question: Given the following conditions:

- Unit 2 Forced Outage due to excessive vibrations on "C" RCP
- You have been assigned to work the night shift on the 2nd and 3rd nights of your "7-OFF"
- You arrive at work at 1800 on your 1st night shift
- You receive a 30 minute turnover and commence work hanging clearances, etc.
- At 0600, while attempting to exit the RCA, it is determined that you are contaminated and require extensive decontamination.
- 2.5 hours later, you are able to leave the RCA and report to the Work Control Center to sign related master copies of the procedures, clearances, etc.
- It takes you 20 minutes to complete all required paperwork, and then you leave the site

When is the earliest you could report to work on your 2nd night shift without requiring an Extended Overtime Request Approval? (See attached 1999 Shift Schedule, assume you are on Shift 5.)

Answer: 8 hours later (1650)

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen 2.1.5 2.3 / 3.4

References: PLP-015, Program For Nuclear Power Plant Staff Working Hours, section 4.1.5

RO ADMIN A.1
QUESTION # 2

REFERENCE ALLOWED: __X__ / ____
yes no

Question: Given the following conditions:

- MODE 1, steady state
- No LCOs in effect
- Minimum shift complement is in place
- At 1:30 PM, the RO received an emergency call from home requiring him to depart the site. He is given permission and departs at 1:35 PM.

What are the requirements (including documentation) associated with crew complement and shift relief which must be satisfied?

Answer:
[.5] An additional qualified licensed operator shall assume the RO position within 2 hours.
[.5] OMM-001-12, Attachment 6.18, WATCHSTANDER'S MIDDLE-OF-THE-SHIFT TURNOVER SHEET must be completed.

[Not required for credit]: Per Technical Specifications, minimum shift complement may be less than required for up to 2 hours due to emergency.

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen. 2.1.4 2.3/3.4

References:
10 CFR 50.54(m)(2)(i)
ITS, section 5.2.2
OMM-001-2,
OMM-001-12, Minimum Equipment List and Shift Relief

RO ADMIN A.1
QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- MODE 1, steady state
- No LCOs in effect
- Minimum shift complement is in place
- At 1:30 PM, the RO received an emergency call from home requiring him to depart the site. He is given permission and departs at 1:35 PM.

What are the requirements (including documentation) associated with crew complement and shift relief which must be satisfied?

MONTH	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F
JANUAR	23	24	25	26	27	28	29	30	31					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
FEBRUA	27	28								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
MARCH			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
APRIL	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						1	2
MAY	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					1	2	3	4	5	6	7
JUNE	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						1	2	3	4	5	6	7	8	9	10	11
JULY	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AUGUS	21	22	23	24	25	26	27	28	29	30	31					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SEPTEM	25	26	27	28	29	30						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OCTOB	30	31					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
NOVEMBER			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
DECEM	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					1	2	3
SHIFT 1	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N
SHIFT 2	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	D	X	X	T	T	T	T	X
SHIFT 3	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	D
SHIFT 4	X	X	X	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X
SHIFT 5	X	X	X	N	N	N	X	X	X	X	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X

RO ADMIN A.1
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question:

Given the following conditions:

- Unit 2 Forced Outage due to excessive vibrations on "C" RCP
- You have been assigned to work the night shift on the first 2 days of your "7-OFF"
- You arrive at work at 1800 on your first night shift
- You receive a 30 minute turnover and commence work hanging clearances, etc.
- At 0600, while attempting to exit the RCA, it is determined that you are contaminated and require extensive decontamination.
- 2.5 hours later, you are able to leave the RCA and report to the Work Control Center to sign related master copies of the procedures, clearances, etc.
- It takes you 20 minutes to complete all required paperwork, and then you leave the site

When is the earliest you could report to work on your 2nd night shift without requiring an Extended Overtime Request Approval? (See attached 1999 Shift Schedule, assume you are on Shift 5.)

RO ADMIN A.3
QUESTION # 1

REFERENCE ALLOWED: __X__ / ____
yes **no**

Question: Given the following conditions:

- MODE 1, 100% power
- As a result of a leaking secondary neutron source, Area Radiation Monitor readings in the Auxiliary Building are as follows:
  - ⇒ R-4, Charging Pump Room = 45 mR/hr
  - ⇒ R-9, Letdown Line = 800 mR/hr
- "C" Charging Pump is OOS for pump shaft replacement
- The work activity will take 3 individuals 12 hours to complete
- Doses (CP&L year-to-date) for the individuals are as follows:
  - ⇒ Don ... 480 mR
  - ⇒ Dan ... 580 mR
  - ⇒ Doug .. 1480 mR

Assuming all three individuals will spend the entire 12 hours in the Charging Pump Room, determine their exposures and any administrative requirements that would have to be satisfied.

Answer: (12 hrs)(45 mR/hr) = 540mR
Don: 540 mR + 480 mR = 1020 mR
Dan: 540 mR + 580 mR = 1120 mR
Doug: 540 mR + 1480 mR = 2020 mR

CP&L Annual Administrative Exposure limit = 2000 mR
Site Vice President must approve an extension for Doug

CANDIDATE'S RESPONSE

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Time: 10 min.

K/A Rating: Gen. 2.3.4 2.5/3.1

References: DOS-NGGC-0004, Administrative Dose Limit Changes

RO ADMIN A.3
QUESTION # 2

REFERENCE ALLOWED: __X__ / ______
yes no

Question: Given the following conditions:

- Waste Gas Decay Tank "A" = 50 psig - IN SERVICE
- Waste Gas Decay Tank "B" = 40 psig - COVER
- Waste Gas Decay Tank "C" = 20 psig - STANDBY
- Waste Gas Decay Tank "D" = 80 psig - Being released
- R-14C, PLANT EFFLUENT NOBLE GAS LOW RANGE, alarms moments after the gas release is initiated
- The Inside Auxiliary Operator reports RCV-014, WASTE GAS DECAY TANK RELEASE ISOLATION Valve will not close

What action(s) would you take to mitigate this situation?

Answer: Lock closed WD-1620, WGDT"D" VENT to terminate the Gas Release.

[Not Required for Credit]: Determine and correct cause of RCV-014 failure prior to re-commencing the Gas Release

CANDIDATE'S RESPONSE

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Time: 10 min.

K/A Rating: Gen. 2.3.10 2.9/3.3

References: OP-706, Waste Disposal - Gaseous Rad. Waste Release
P&ID 5379-921, sheet 2

RO ADMIN A.3
QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- Waste Gas Decay Tank "A" = 50 psig - IN SERVICE
- Waste Gas Decay Tank "B" = 40 psig - COVER
- Waste Gas Decay Tank "C" = 20 psig - STANDBY
- Waste Gas Decay Tank "D" = 80 psig - Being released
- R-14C, PLANT EFFLUENT NOBLE GAS LOW RANGE, alarms moments after the gas release is initiated
- The Inside Auxiliary Operator reports RCV-014, WASTE GAS DECAY TANK RELEASE ISOLATION Valve will not close

What action(s) would you take to mitigate this situation?

RO ADMIN A.3
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- MODE 1, 100% power
- As a result of a leaking secondary neutron source, Area Radiation Monitor readings in the Auxiliary Building are as follows:
  - ⇒ R-4, Charging Pump Room = 45 mR/hr
  - ⇒ R-9, Letdown Line = 800 mR/hr
- "C" Charging Pump is OOS for pump shaft replacement
- The work activity will take 3 individuals 12 hours to complete
- Doses (present quarter) for the individuals are as follows:
  - ⇒ Don ... 480 mR
  - ⇒ Dan ... 580 mR
  - ⇒ Doug .. 1480 mR

Assuming all three individuals will spend the entire 12 hours in the Charging Pump Room, determine their exposures and any administrative requirements that would have to be satisfied.

RO ADMIN A.4
QUESTION # 1

REFERENCE ALLOWED: ______ / __X__
yes no

Question: Given the following conditions:

- A Site Area Emergency was declared 2 hours ago
- A radiological release is still in progress
- The wind is blowing from the South (180°)
- A large electrical fire erupts in the Technical Support rendering it unusable

Using the attached Plot Plan of the H. B. Robinson site, state the locations of the primary and alternate locations of the TSC and OSC.

Answer: Technical Support Center: PRI: Nuclear Training Building
ALT: Unit 2 Control Room

Operations Support Center: PRI: O & M Building
ALT: Unit 1 Maintenance Shop

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen 2.4.39 3.3/3.1

References: PLP-007, Emergency Plan, section 5.5.2, 5.5.3

RO ADMIN A.4
QUESTION # 2

REFERENCE ALLOWED: ______ / __X__
yes no

Question: Given the following conditions:

- Plant shutdown in progress
- A Category 3 hurricane is within 4 hours of the H.B. Robinson Station
- An Alert was declared at 9:22 PM
- Notification to the State and Counties was made at 9:34 PM
- The TSC, OSC, and EOF were activated by 10:10 PM

Explain the process for transferring responsibility for NRC Communications from the Control Room to the Technical Support Center including the time NRC notification is required by.

Answer: [.5] Perform a turnover with the NRC and EOF Communicators. Ensure completion times of the last notification (i.e., the Emergency Notification Form) are available, via fax or electronic means, for the EOF Communications staff.

[.5] 10:22 PM, NRC notification required as soon as possible after State and Counties and not later than 1 hour after declaration of the event:

CANDIDATE'S RESPONSE

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Time: 5 min.

K/A Rating: Gen. 2.1.39 3.3/3.1

References: EPNOT-01, CR/EOF Emergency Communicator
EPNOT-04, TSC NRC Emergency Communicator
10 CFR 50.72(a)(3)

RO ADMIN A.4
QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: _____ / __X__
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- Plant shutdown in progress
- A Category 3 hurricane is within 4 hours of the H.B. Robinson Station
- An Alert was declared at 9:22 PM
- Notification to the State and Counties was made at 9:34 PM
- The TSC, OSC, and EOF were activated by 10:10 PM

Explain the process for transferring responsibility for NRC Communications from the Control Room to the Technical Support Center including the time NRC notification is required by.

RO ADMIN A.4
QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: _____ / __X__
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the following conditions:

- A Site Area Emergency was declared 2 hours ago
- A radiological release is still in progress
- The wind is blowing from the East - Northeast (75°)
- A large electrical fire erupts in the Technical Support rendering it unusable

Using the attached Plot Plan of the H. B. Robinson site, state the locations of the primary and alternate locations of the TSC and OSC.

REGION II

JOB PERFORMANCE MEASURE

JPM IP-112 (REV 1)

REMOVING INSTRUMENT AIR COMPRESSOR “D”AND ASSOCIATED DRYER FROM SERVICE IAW OP-905

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

REGION II

JOB PERFORMANCE MEASURE

Task:

Remove Instrument Air Compressor "D" and Associated Dryer from service

Alternate Path:

N/A

Facility JPM #:

IP-112
AO / RO / SRO

K/A Rating(s):

GEN 2.1.23 3.9/4.0
GEN 2.1.30 3.9/3.4

Task Standard:

Instrument Air Compressor "D" and Associated Dryer removed from Service IAW OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator ______ In-Plant __X__ Perform ______ Simulate __X__

References:

OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

Validation Time: 12 min. **Time Critical:** No

Candidate: ________________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ________________________ ________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 1
Critical because compressor must be unloaded prior to securing.

Step 2
Critical because stop button must be depressed to accomplish task.

Step 4
Critical because IA-3818 must be shut to prevent potential loss of instrument air due to IAC "D" being secured.

Step 5
Critical because power must be removed to remove the dryer from service.

Tools/Equipment/Procedures Needed:

OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE, completed through step 7.4.1.2

READ TO CANDIDATE

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

INITIAL CONDITIONS:

You are the Outside Auxiliary Operator.

The Initial Conditions of OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE, have been completed with the Primary Air Compressor in service.

A pre-job briefing has been completed for this task.

INITIATING CUES:

The Control Room Shift Supervisor (CRSS) has directed you to perform OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

START TIME: ________

STEP 1: Place the load/unload toggle Switch in the UNLOAD position. (Step 7.4.2.1) STANDARD: The load/unload toggle Switch is simulated placed in the UNLOAD position. EXAMINER'S CUE: **After operator locates and simulates placing the load/unload Switch in the UNLOAD position, inform him the switch is in the UNLOAD position.** COMMENTS:	___ SAT ___ UNSAT

NOTE: Depressing the STOP pushbutton will cause all local trip alarms to illuminate. Also, APP-002-E7, INSTR AIR CMPR D TRIP, will alarm in the control room.

STEP 2: WHEN 3 seconds has elapsed, THEN depress the STOP pushbutton. (Step 7.4.2.2) STANDARD: The operator depresses the STOP pushbutton after at least 3 seconds after placing the load/unload switch in UNLOAD. EXAMINER'S CUE: **If the operator calls the Control Room to inform them to expect APP-002-E7, acknowledge as the Control Room.** **After the operator simulates depressing the STOP pushbutton, inform him that the air compressor has stopped, and local alarms are illuminated.** EXAMINERS'S NOTE: **Since a pre-job briefing was conducted (initial conditions), the operator may not call the Control Room about the expected annunciator** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Verify that the AUTO OPERATION light is extinguished. (Step 7.4.2.3) STANDARD: The operator determines the AUTO OPERATION light is extinguished EXAMINER'S CUE: **After operator locates the AUTO OPERATION light, inform him it is extinguished.** COMMENTS:	___ SAT ___ UNSAT

STEP 4: Close IA-3818, IA DRYER "D" DISCHARGE. (Step 7.4.2.4) STANDARD: The operator simulates closing IA-3818, IA DRYER "D" DISCHARGE by turning the handle perpendicular to the piping. **EXAMINER'S CUE: After operator locates IA-3818 and simulates closing valve, inform him the valve that valve handle is perpendicular to the pipe.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Place IA DRYER "D" POWER switch to the OFF position. (Step 7.4.2.5) STANDARD: The operator simulates placing IA DRYER "D" POWER switch to the OFF position. **EXAMINER'S CUE: When IA DRYER "D" POWER switch is located and operation is simulated, inform operator that OFF is displayed in the power switch window.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Throttle open the following valves to remove condensation then close the valves: IA-3832, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. (Step 7.4.2.6 1st bullet) STANDARD: The operator simulates opening then closing IA-3832, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. **EXAMINER'S CUE: After operator locates valve and simulates opening/throttling valve, inform him the valve has been rotated counter-clockwise.** **After operator simulates closing valve, inform him the valve cannot be rotated any further clockwise.** COMMENTS:	___ SAT ___ UNSAT

STEP 7: IA-3833, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. (Step 7.4.2.6 2nd bullet) STANDARD: The operator simulates opening then closing IA-3833, INSTRUMENT A/C "D" INTERCOOLER MANUAL DRAIN. **EXAMINER'S CUE:** **After the operator locates valve and simulates opening/throttling valve, inform him the valve has been rotated counter-clockwise.** **After the operator simulates closing valve, inform him the valve cannot be rotated any further clockwise.** COMMENTS:	___ SAT ___ UNSAT
STEP 8: IA-3824, IA DRYER "D" TRAP MANUAL DRAIN. (Step 7.4.2.6 3rd bullet) STANDARD: The operator simulates opening then closing IA-3824, IA DRYER "D" TRAP MANUAL DRAIN by turning the handle parallel to the pipe to open then perpendicular to the pipe to close the valve. **EXAMINER'S CUE:** **After the operator locates valve and simulates opening/throttling valve, inform him the valve handle is aligned in-line (parallel) with its piping.** **After the operator simulates closing valve, inform him the valve handle is perpendicular with its piping.** COMMENTS:	___ SAT ___ UNSAT
STEP 9: IA-3667, IA RECEIVER "D" STRAINER DRAIN. (Step 7.4.2.6 4th bullet) STANDARD: The operator simulates opening then closing IA-3667, IA RECEIVER "D" STRAINER DRAIN by turning the handle parallel to the pipe to open then perpendicular to the pipe to close the valve. **EXAMINER'S CUE:** **After the operator locates IA-3667 and simulates opening/throttling valve, inform him the valve handle is aligned in-line (parallel) with its piping.** **After the operator simulates closing valve, inform him the valve handle is perpendicular with its piping.** COMMENTS:	___ SAT ___ UNSAT

<u>STEP10</u>:	IA-3826, IA DRYER "D" AIR LINE DRAIN. (Step 7.4.2.6 5th bullet)	
<u>STANDARD</u>:	The operator simulates opening then closing IA-3826, IA DRYER "D" AIR LINE DRAIN.	___ SAT
EXAMINER'S CUE:	**After the operator locates IA-3826 and simulates opening/throttling valve, inform him the valve handle is aligned in-line (parallel) with its piping.** **After the operator simulates closing valve, inform him the valve handle is perpendicular with its piping.**	___ UNSAT
<u>COMMENTS</u>:		
	<u>**END OF TASK**</u>	

STOP TIME: _____

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Outside Auxiliary Operator.

The Initial Conditions of OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE, have been completed with the Primary Air Compressor in service.

A pre-job briefing has been completed for this task.

INITIATING CUES:

The Control Room Shift Supervisor (CRSS) has directed you to perform OP-905 Section 7.4, REMOVING INSTRUMENT AIR COMPRESSOR "D" AND ASSOCIATED DRYER FROM SERVICE.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-001

Start a Reactor Coolant Pump

CANDIDATE ____

EXAMINER ____

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start a Reactor Coolant Pump IAW OP-101
003*001*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-001
RO / SRO

K/A Rating(s):

003 000	A1.05	3.4/3.5
	A3.01	3.3/3.2
	A3.03	3.2/3.1
	A3.04	3.6/3.6
	A4.01	3.3/3.2
	A4.04	3.1/3.0
	GEN.13	3.6/3.7

Task Standard:

"B" RCP running and degraded voltage protection returned to normal.

Preferred Evaluation Location: Simulator __X__ In-Plant _____

Preferred Evaluation Method: Perform __X__ Simulate _____

References:

OP-101, Section 5.1

Validation Time: 20 min. **Time Critical:** No

Candidate: ______________________
NAME

Time
Time Start : ________
Time Finish: ________

Performance Time (min): _________

Performance Rating: SAT _____ UNSAT _____

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

COMMENTS

Step 11
Critical because calculation involved to determine required No. 1 Seal DP.

Step 29
Critical because starting an RCP without Degraded Grid Protection bypassed would initiate Emergency Bus Sequencer action.

Step 31
Critical because starting an RCP without Degraded Grid Protection bypassed would initiate Emergency Bus Sequencer action.

Step 33
Critical because starting an RCP without the Bearing Oil Lift Pump running with adequate oil/pressure supplied to the Upper Thrust Shoes would cause damage to the RCP.

Step 34
Critical because a minimum of 2 minutes of Bearing Lift Pump operation is specified prior to RCP start.

Step 35
Critical because a minimum of 50 seconds of RCP operation is required prior to stopping the Bearing Lift Pump.

Step 36
Critical because enabling Degraded Grid Voltage Protection with the signal present (light bulb burnt out) would cause Emergency Bus Sequencer action.

Step 37
Critical because this is the last RCP to be started and Technical Specification 3.3.5 requires Degraded Grid Protection (E2) enabled.

Step 39
Critical because enabling Degraded Grid Voltage Protection with the signal present (light bulb burnt out) would cause Emergency Bus Sequencer action.

Step 40
Critical because this is the last RCP to be started and Technical Specification 3.3.5 requires Degraded Grid Protection (E2) enabled.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-211, go to RUN and activate CAEP 88_JPM_CR_001_R11
2. If IC-211 is not functioning, perform the following:
   - Initialize simulator to IC-7 and go to RUN.
   - Stop "B" RCP, place PCV-455A in manual and close "B" Loop Spray Valve.
   - Allow simulator to stabilize before placing in Freeze
3. Place simulator in run when directed by the examiner.
4. APP-010-F5 and APP-010-F6 are illuminated when Degraded bus voltage is defeated (RFI EPD Local Actions EPS007, EPS008).
5. Once the operator has identified the correct procedure the evaluator will provide him a copy of OP-101, Section 5.1 with Steps 5.1.1.1 through 5.1.1.8 initialed as completed.

SIMULATOR OPERATOR INSTRUCTIONS:

Update Control Room Status Board to IC-7 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-101

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant is in hot standby
2. RCS is at 547°F and 2235 psig
3. "B" RCP was stopped 7 hours earlier for motor inspection
4. All plant controls are in auto/normal
5. No other plant equipment is OOS

INITIATING CUES:

The CRSS has directed you to start "B" RCP in accordance with plant procedures. The initial conditions associated with starting the RCP have been completed.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-101, section 5.1 **EXAMINER CUE: Hand the operator the copy of OP-101, section 5.1 (complete through 5.1.1.8) after he/she locates it.** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Verify open the No. 1 Seal leakoff valve for each RCP (Step 5.1.2.1) STANDARD: Operator determines CVC-303A, B, C Seal Leakoff valves are open by observing the red open light illuminated above the RTGB control switches COMMENTS:	____ SAT ____ UNSAT
STEP 3: Verify seal injection flow to each RCP is between 8 and 13gpm (Step 5.1.2.2) STANDARD: Direct an Auxiliary Operator to verify seal injection flows between 8 and 13gpm. **BOOTH INSTRUCTOR'S CUE: When directed, report all seal injection flows are ~9gpm.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: Verify Thermal Barrier labyrinth seal differential pressure (DP) is $\geq$ to 5 inches water column. (Step 5.1.2.3) STANDARD: Operator determines "B" RCP Thermal Barrier Labyrinth Seal DP is $\geq$ 5 inches water column on PI-128A. **EXAMINER'S NOTE: "B" RCP Thermal Barrier Labyrinth Seal DP indicates ~ 28"** COMMENTS:	____ SAT ____ UNSAT

NOTE: The No. 1 Seal by-pass system is used when RCS pressure is less than 1000 psig, to prevent the RCP pump bearing temperature and the No.1 Seal leakoff temperature from reaching alarm levels.

STEP 5: IF any No. 1 Seal leakoff flow rate is < 1 gpm AND RCS pressure is between 100 and 1000 psig, THEN open CVC-307, PRI SEAL BYP ISO. (Step 5.1.2.4) STANDARD: This step should be marked N/A, RCS pressure > 1000psig. All Seal leakoff flow rates verified > 1 gpm on RTGB recorders FR-154A (WR) and FR-154B (NR). **EXAMINER'S NOTE: RCS pressure ~2235 psig** **all seal leakoff flows ~3.5 gpm** COMMENTS:	____ SAT ____ UNSAT
STEP 6: Check that the maximum starting limits of Section 4.2.2 will not be exceeded. (Step 5.1.2.5) STANDARD: "B" RCP has not been started in the last 7 hours. Maximum starting limits verified satisfactory ... "B" RCP start allowed. COMMENTS:	____ SAT ____ UNSAT
STEP 7: Check the associated RCP STP HI AND RCP STP LO alarms are not illuminated on the 2x2 Status Light Panel. (Step 5.1.2.6) STANDARD: Operator determines "B" RCP STP HI AND RCP STP LO alarms are extinguished. COMMENTS:	____ SAT ____ UNSAT
STEP 8: Check that the associated RCP Oil Reservoir level annunciator is EXTINGUISHED. (Step 5.1.2.7) STANDARD: Operator determines APP-001-E8, RCP B OIL RESERV HI/LO LVL extinguished. COMMENTS:	____ SAT ____ UNSAT

STEP 9: Verify No. 1 Seal DP is > 210 psid. (Step 5.1.2.8) STANDARD: Operator determines "B" RCP No. 1 Seal DP > 210 psid on PI-155A. **EXAMINER'S NOTE: No. 1 Seal DP indicates > 400 psid** COMMENTS:	____ SAT ____ UNSAT
STEP 10: IF No. 1 Seal DP is ≤ 400 psid, THEN record No. 1 Seal DP as indicated on the associated instrument (Step 5.1.2.9.a) STANDARD: This step should be marked N/A, No. 1 Seal DP on PI-155A > 400 psid **EXAMINER'S NOTE: No. 1 Seal DP indicates > 400 psid** COMMENTS:	____ SAT ____ UNSAT
STEP 11: IF No. 1 Seal DP is > 400 psid, THEN calculate No. 1 Seal DP by subtracting VCT pressure from RCS pressure (Step 5.1.2.9.b) STANDARD: "B" RCP No. 1 Seal DP calculated/recorded by subtracting VCT pressure from RCS pressure. (~2200 psig) COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 12: If No. 1 Seal DP is an even multiple of 50, record value in step 5.1.2.9.c. Otherwise, round up to the next highest multiple of 50 and record in step 5.1.2.9.d. (Step 5.1.2.9.c,d) STANDARD: "B" RCP No. 1 Seal DP recorded. (2200 or 2250 psig) **EXAMINER'S NOTE: If operator calculated other than 2200 psig, he/she will round up to2250 psig.** COMMENTS:	____ SAT ____ UNSAT

STEP 13: Record the No. 1 Seal minimum leakoff flow from Table 2, that corresponds to the No. 1 Seal DP recorded above. (Step 5.1.2.9.e) STANDARD: .98 to 1.00 gpm recorded as the minimum No. 1 Seal leakoff flow for "B" RCP. COMMENTS:	____ SAT ____ UNSAT
STEP 14: Check the indicated No. 1 Seal leakoff flow is ≥ the minimum value recorded above AND ≤ 6 gpm. (Step 5.1.2.10) STANDARD: No. 1 Seal leakoff verified ≥ calculated value and ≤ 6 gpm by observing RTGB Recorders FR-154A and B. **EXAMINER'S NOTE: All seal leakoff flows indicate ~ 3.5 gpm** COMMENTS:	____ SAT ____ UNSAT
STEP 15: Verify VCT pressure is > 15 psig. (Step 5.1.2.11) STANDARD: Operator determines VCT pressure > 15 psig by observing PI-117 **EXAMINER'S NOTE: VCT pressure indicates ~ 25 psig** COMMENTS:	____ SAT ____ UNSAT
STEP 16: IF RCS pressure is > 400 °F, THEN verify VCT temperature is between 60 °F and 130 °F. (Step 5.1.2.12) STANDARD: VCT temperature verified between 60 °F and 130 °F on TI-116. **EXAMINER'S NOTE: VCT temperature indicates ~ 102 °F** COMMENTS:	____ SAT ____ UNSAT

STEP 17: IF RCS pressure is ≤ 400 °F, THEN verify VCT temperature is between 60 °F and 150 °F (Step 5.1.2.13) STANDARD: N/A, RCS temperature = 547 °F COMMENTS:	____ SAT ____ UNSAT

NOTE: The following CCW temperature limits are applicable for starting AND continuous operation of the RCPs.

STEP 18: IF RCS Cold Leg temperature is ≤ 350 °F, THEN verify CCW Heat Exchanger Outlet temperature is 44 °F to 125 °F. (Step 5.1.2.14.a) STANDARD: N/A, RCS Cold Leg temperature =547 °F COMMENTS:	____ SAT ____ UNSAT
STEP 19: IF RCS Cold Leg temperature is > 350 °F AND ≤ 475 °F, THEN verify CCW Heat Exchanger Outlet temperature is 44 °F to 105 °F (Step 5.1.2.14.b) STANDARD: N/A, RCS Cold Leg temperature = 547 °F COMMENTS:	____ SAT ____ UNSAT
STEP 20: IF RCS Cold Leg temperature is > 475 °F, THEN verify CCW Heat Exchanger Outlet temperature is 45 °F to 105 °F. (Step 5.1.2.14.c) STANDARD: Operator determines CCW Heat Exchanger Outlet temperature is between 45 °F and 105 °F on TI-607 **EXAMINER'S NOTE: CCW Heat Exchanger outlet temperature indicates ~ 83°F** COMMENTS:	____ SAT ____ UNSAT

STEP 21: Check the following bearing temperatures are within limits: (Step 5.1.2.15.a through e) a. Upper Thrust Brg < 185 °F b. Lower Thrust Brg < 185 °F c. Upper Guide Brg < 185 °F d. Lower Guide Brg < 185 °F e. Pump Brg < 175 °F STANDARD: "B" RCP Bearing temperatures checked within limits on Recorder TR-448. a. Point 9: Upper Thrust Brg < 185 °F b. Point 10: Lower Thrust Brg < 185 °F c. Point 11: Upper Guide Brg < 185 °F d. Point 12: Lower Guide Brg < 185 °F e. Point 14: Pump Brg < 175 °F **EXAMINER'S NOTE: Points 9 - 12 indicate ~88°F** **Point 14 indicates ~ 102°F** COMMENTS:	____ SAT ____ UNSAT
STEP 22: Check Stator Winding temperature < 248 °F. (Step 5.1.2.16) STANDARD: "B" RCP Stator Winding temperature checked < 248 °F on Recorder TR-448, Point 13. **EXAMINER'S NOTE: Point 13 indicates ~ 120°F** COMMENTS:	____ SAT ____ UNSAT
STEP 23: IF the RCP is to be operated continuously, AND the RCS is below 400 psig, THEN verify the LPMS switch on the RTGB is in the NORM position AND the system is aligned IAW OP-007. (Step 5.1.2.17) STANDARD: N/A, RCS pressure is at 2235 psig. COMMENTS:	____ SAT ____ UNSAT

STEP 24: IF this procedure has been directed by the EOP network, THEN the following step is not required. (Step 5.1.2.18) STANDARD: Operator marks this step N/A, not in the EOP network. COMMENTS:	_____ SAT _____ UNSAT

NOTE: Monitoring the primary side of the S/G while starting a RCP will detect any potential loose part(s) that may become mobile. After the pump is started continuous monitoring of all channels for satisfactory indication is not necessary beyond two minutes.

STEP 25: Verify personnel are stationed to monitor the Digital Metal Impact Monitoring System (Loose Parts Monitor). (Step 5.1.2.19) STANDARD: Operator dispatches AO / STA to the LPMS. **BOOTH INSTRUCTOR'S CUE: When directed, respond that you are standing by at the Loose Parts Monitor** COMMENTS:	_____ SAT _____ UNSAT
STEP 26: Notify Security AND I&C that a RCP will be started and that the Security UPS Inverter may trip (CR 98-00876) (Step 5.1.2.20) STANDARD: Security and I&C are notified of RCP start **BOOTH INSTRUCTOR'S CUE: If called, respond as Security and/or I&C. Acknowledge RCP start and the potential for the Security UPS Inverter to trip.** **EXAMINER'S CUE: If the operator requests the CRSS/SSO to notify Security and I&C, respond that Security and I&C have been notified.** COMMENTS:	_____ SAT _____ UNSAT

<u>STEP 27</u>: IF this procedure has been directed by the EOP network, THEN the following step is not required. (Step 5.1.2.21) <u>STANDARD</u>: Operator marks this step N/A, not in the EOP network <u>COMMENTS</u>:	____ SAT ____ UNSAT

NOTE: The RCP motor heaters control switch is located in the Rod Control Room. One switch controls all three RCP motor heaters.

<u>STEP 28</u>: <u>IF</u> the RCP is to be operated continuously, <u>THEN</u> place the RCP-SPACE HEATER-SW control switch in the OFF position. (Step 5.1.2.22) <u>STANDARD</u>: Operator dispatches an AO to verify the RCP-SPACE HEATER-SW control switch in the OFF position. **EXAMINER'S NOTE:. The operator may not dispatch an AO due to this switch already being positioned to OFF** <u>COMMENTS</u>:	____ SAT ____ UNSAT

NOTE: ITS LCO 3.3.5 allows bypassing Degraded Grid Protection when the Unit is **NOT** in Mode 1.

<u>STEP 29</u>: On the front of Bus E-1, Cubicle 18A, install key in the DEGRADED GRID VOLTAGE keylock switch <u>AND</u> place in the DEFEAT position. (Step 5.1.2.23.a) <u>STANDARD</u>: Operator dispatches an AO to defeat Degraded Grid Protection **BOOTH INSTRUCTOR'S CUE: When directed, defeat Degraded Grid Protection on Bus E-1 RFI EPS007** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT

STEP 30: Verify annunciator APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is ILLUMINATED. (Step 5.1.2.23.b) STANDARD: APP-010-F5 verified illuminated. COMMENTS:	____ SAT ____ UNSAT
STEP31: On the front of Bus E-2, Cubicle 28A, install key in the DEGRADED GRID VOLTAGE keylock switch AND place in the DEFEAT position. (Step 5.1.2.23.c) STANDARD: Operator dispatches an AO to defeat Degraded Grid Protection **BOOTH INSTRUCTOR:** **When directed, defeat Degraded Grid Protection on Bus E-2 RFI EPS008** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 32: Verify annunciator APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is ILLUMINATED. (Step 5.1.2.23.d) STANDARD: APP-010-F6 verified illuminated. COMMENTS:	____ SAT ____ UNSAT
STEP 33: Start the BRG LIFT PUMP AND verify the LIFT PRESSURE light ILLUMINATES. (Step 5.1.2.24) STANDARD: "B" RCP Bearing Lift Pump started and Lift Pressure light verified illuminated. COMMENTS: **Record BRG LIFT PUMP start time: ________**	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Only one Reactor Coolant Pump is to be started at a time.

STEP 34: WHEN the Brg Lift Pump has operated for a minimum of 2 minutes, THEN start the Reactor Coolant Pump. (Step 5.1.2.25) STANDARD: After a minimum of 2 minutes, the operator announces (over the plant page) and starts "B" RCP. Operator observes: •"B" RCP red light on, green light off •RCS LOOP 2 flow increases to ~100% value **EXAMINER'S NOTE: Plant announcement not included as critical task** COMMENTS: **Record RCP start time (hr:min:sec): __________** **Verify >2 minutes since time recorded in step 32**	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 35: WHEN a minimum of 50 seconds has elapsed since the Reactor Coolant Pump was started, THEN stop the BRG LIFT PUMP. (Step 5.1.2.26) STANDARD: After at least 50 seconds have elapsed since the "B" RCP was started, the Bearing Lift Pump is stopped. COMMENTS: **Record BRG LIFT PUMP stop time (hr:min:sec): __________** **Verify >50 seconds since time recorded in step 33**	**CRITICAL STEP** ____ SAT ____ UNSAT

CAUTION: Do not restore the Degraded Grid Voltage Protection to NORMAL until the Amber indicating light is Extinguished.

NOTE: The Degraded Grid Voltage keylock keys cannot be removed from switches unless positioned to NORMAL.

NOTE: If more than one RCP is to be started the degraded grid voltage protection may remain bypassed until all RCP starts have been completed.

STEP 36: Momentarily depress the amber E-1 DEGRADED GRID TRIP SIGNAL light cover AND verify the light ILLUMINATES. (Step 5.1.2.27.a, b) STANDARD: Operator directs AO to: • momentarily depress the amber E-1 DEGRADED GRID TRIP SIGNAL light cover AND verify the light ILLUMINATES • verify the light extinguishes when released **BOOTH INSTRUCTOR:** **When directed, report E-1 DEGRADED GRID TRIP SIGNAL light illuminates when depressed and is extinguished when released.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 37: Place E-1 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. (Step 5.1.2.27.c, d) STANDARD: Operator directs AO to place E-1 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. **BOOTH INSTRUCTOR:** **When directed, report the E-1 DEGRADED GRID VOLTAGE key switch in NORMAL and key removed.** **DRF EPS007** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 38: Verify annunciator APP-010-F5, DEGRADED GRID E-1 PROT BYPD, is EXTINGUISHED. (Step 5.1.2.27.e) STANDARD: APP-010-F5, DEGRADED GRID E-1 PROT BYPD, verified EXTINGUISHED. COMMENTS:	____ SAT ____ UNSAT

<u>STEP 39</u>: Momentarily depress the amber E-2 DEGRADED GRID TRIP SIGNAL light cover <u>AND</u> verify the light ILLUMINATES. (Step 5.1.2.28.a,b) <u>STANDARD</u>: Operator directs AO to: • momentarily depress the amber E-2 DEGRADED GRID TRIP SIGNAL light cover <u>AND</u> verify the light ILLUMINATES • verify the light extinguishes when released **BOOTH INSTRUCTOR:** **When directed, report E-2 DEGRADED GRID TRIP SIGNAL light illuminates when depressed and is extinguished when released.** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 40</u>: Place E-2 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. (Step 5.1.2.28.c, d) <u>STANDARD</u>: Operator directs AO to place E-2 DEGRADED GRID VOLTAGE key switch to NORMAL and remove the key. **BOOTH INSTRUCTOR:** **When directed, report the E-2 DEGRADED GRID VOLTAGE key switch in NORMAL and key removed.** **DRF EPS008** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 41</u>: Verify annunciator APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is EXTINGUISHED. (Step 5.1.2.28.e) <u>STANDARD</u>: APP-010-F6, DEGRADED GRID E-2 PROT BYPD, is verified EXTINGUISHED. <u>COMMENTS</u>:	____ SAT ____ UNSAT

TIME STOP: ________

END OF JPM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Plant is in hot standby
2. RCS is at 547°F and 2235 psig
3. "B" RCP was stopped 7 hours earlier for motor inspection
4. All plant controls are in auto/normal
5. No other plant equipment is OOS

INITIATING CUES:

The CRSS has directed you to start "B" RCP in accordance with plant procedures. The initial conditions associated with starting the RCP have been completed.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-004

Respond to ATWS Event

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the immediate actions of FRP-S.1
000*029*R5*01

Alternate Path:

Reactor will not trip from the RTGB
Turbine will not trip from the RTGB
Turbine will not runback from the RTGB

Facility JPM #:

JPM CR-004

K/A Rating(s):

004 A4.18	4.3/4.1	029 EA1.09	4.0/3.6
000 EA1.01	3.4/3.1	029 EA1.12	4.1/4.0
000 EA1.08	4.5/4.5	029 EA1.14	4.2/3.9
000 EA1.09	4.0/3.6	029 EA1.15	4.1/3.9
000 EA1.12	4.1/4.0	029 EA2.05	3.4/3.4
000 EA1.13	4.1/3.9	029 EA2.07	4.2/4.3
029 EA1.01	3.4/3.1	2.4.49	4.0/4.0

Task Standard:

Immediate actions associated with an ATWS condition performed IAW FRP-S.1

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ Perform __X__ Simulate ______

References:

FRP-S.1

Validation Time: 10 min. **Time Critical:** YES (3 min.)

Candidate: ______________________________
NAME

	Overall Time	Critical Time
Start:	__________	__________
Finish:	__________	__________
Performance Time (min):	__________	__________

Examiner: ______________________ ______________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because operator must determine an automatic reactor trip signal was initiated and the reactor failed to trip

Step 6, 7
Critical because prompt operator action is required to insert negative reactivity to the reactor

Step 11
Critical because prompt operator action is required to trip the turbine to maintain adequate S/G levels (RCS heat sink)

Step 12
Critical because operator action is required to rapidly reduce Turbine load in the event of a failure of the Turbine to trip

Step 13
Critical because operator action is required to isolate the steam supply to the Turbine

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-5, go to RUN, and activate CAEP 88_JPM_CR_004_R7

2. If CAEP is not functioning, perform the following:
   - activate IMF RPS01A and 01B...failure to open in BOTH auto and manual
   - activate IMF TUR02A, B, C... failure of the turbine to trip
   - activate IMF TUR21B ...failure of OTΔT Runback
   - activate IMF TUR05C 100%..........Governor valves fail to respond
   - activate IMF TUR05D 16.8425% Governor valves fail to respond
   - activate IMF TUR05E 100% Governor valves fail to respond
   - activate IMF TUR05F 100% Governor valves fail to respond
   - Place the simulator in FREEZE.

3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

The CAEP has the following triggers included:

- E1 (88_JPM_CR_004): When Control Bank "D" reaches 210 steps (either by manual or automatic insertion), the Reactor Protection System malfunctions will be deleted

- E2 (88_JPM_CR_004_2): When Control Bank "D" reaches 208 steps, the reactor trips breakers will open.

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

FRP-S.1

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The unit is at 100% power. All controls are in auto/normal. No equipment is out-of-service.
2. You are the Reactor Operator and the BOP (the BOP has left the Control Room).

INITIATING CUES:

The CRSS directs you to respond to events as they occur

START TIME: ______

EXAMINER'S NOTE: This scenario starts at 100% power. Approximately 20 seconds after the simulator is placed in RUN, an 800 gpm RCS leak will occur. The operator will attempt to respond to annunciators as they occur. A second Charging Pump may be started to address excessive RCS leakage. The annunciators and bistables associated with OTΔT will alarm, however the runback and reactor trip will fail to occur. The operator should then realize an ATWS event is occurring.

STEP 1: APP-003-F4, CHG PMP HI SPEED alarms due to lowering RCS pressure
 	
STANDARD: Operator:
• acknowledges/silences alarm
• determines RCS pressure is decreasing by observing PI-444, 445, 455, 456, 457
• determines PZR level is decreasing by observing LI-460, 461, 459A
• will check APP-003-F4
  may start an additional Charging Pump
  may enter AOP-016
 	
**BOOTH INSTRUCTOR'S NOTE: Initiate 800 gpm RCS Leak ~20 seconds after the simulator is placed in RUN.
IMF RCS09A ... 800**
 	
COMMENTS:
	____ SAT
	
	____ UNSAT

STEP 2: The following annunciators alarm due to lowering RCS pressure and level: • APP-003-D8, PZR CONTROL HI/LO PRESS • APP-003-E8, PZR CONTROL HI/LO LVL STANDARD: Operator determines: • RCS leakage in progress • starts a second (or third) Charging Pump • all PZR Heaters are energized, Spray valves are closed • entry into AOP-016, Excessive RCS Leakage is required **EXAMINER'S NOTE: Operator may attempt manual reactor trip due to rapid RCS pressure reduction** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	APP-005-D5, OPΔT/OTΔT TURBINE RUNBACK ROD STOP alarms due to lowering RCS pressure	
STANDARD:	Operator determines: • OTΔT Rod Stop and Turbine Runback setpoint & coincidence satisfied • Turbine Runback not in progress	____ SAT
COMMENTS:		____ UNSAT

STEP 4:	APP-004 - E3, OVERTEMP ΔT TRIP (First Out Annunciator) alarms	**CRITICAL STEP**
STANDARD:	Operator determines the reactor failed to automatically trip by observing: • the First Out Annunciator and / or • the Reactor Trip Breaker red & green breaker indicating lights extinguished	____ SAT
COMMENTS:		____ UNSAT

TIME CRITICAL START TIME: ____________

STEP 5:	Check REACTOR TRIP As Follows: (Step 1) • REACTOR TRIP MAIN AND BYP BKRS - OPEN • Rod Position indication - ZERO • Rod Bottom lights - ILLUMINATED • Neutron Flux - DECREASING	____ SAT
STANDARD:	Recognizes the reactor is not tripped • Reactor Trip Main Bkrs - no indication • Rod Position indication CBD-218 • Rod Bottom lights NOT Illuminated • Neutron Flux ~ 100%	____ UNSAT
COMMENTS:		

STEP 6: Depress both Reactor Trip Pushbuttons (Step 1.a RNO.) STANDARD: Both Reactor Trip Pushbuttons on the RTGB depressed. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: Insert Control Rods. (Step 1.b.1 RNO) STANDARD: Control Rods inserted (in Auto or Manual) as indicated by decreasing Control Rod Bank height. **BOOTH INSTRUCTOR'S CUE: Reactor Trip malfunctions are triggered to be deleted when Control Bank "D" reaches 216 steps. (E1) The Reactor Trip Breakers are triggered to open when Control Bank "D" reaches 214 steps. (E2)** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: Dispatch an operator to the MG SET Room to trip the following breakers: (Step 1.b.2 RNO) • REACTOR TRIP BREAKER A & B • GENERATOR CIRCUIT BREAKER A & B STANDARD: An auxiliary operator is dispatched to the MG Set Room to trip the Reactor Trip breakers and Rod Drive MG Set Generator breakers **BOOTH INSTRUCTOR'S CUE: If/when directed, acknowledge order to trip the Reactor Trip breakers and Generator circuit breakers.** **EXAMINER'S CUE: This action is typically performed by the CRSS. IF the operator requests the CRSS / SSO make the plant PA to dispatch the auxiliary operators, acknowledge making the PA** COMMENTS:	____ SAT ____ UNSAT

EXAMINER'S NOTE: The operator may not dispatch auxiliary operators due to the Reactor Trip breakers opening as required.

<u>STEP 9</u>: Dispatch an operator to 480V Busses 2B and 3 to trip the following breakers: (Step 1.b.3 RNO) • ROD DRIVE MOTOR GENERATOR SET A & B <u>STANDARD</u>: An auxiliary operator is dispatched to 480V Busses 2B & 3 to trip the .Rod Drive MG Sets **BOOTH INSTRUCTOR'S CUE: If/when directed, acknowledge order to trip the Rod Drive MG Sets** **EXAMINER'S CUE: This action is typically performed by the CRSS. IF the operator requests the CRSS / SSO make the plant PA to dispatch the auxiliary operators, acknowledge making the PA** <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 10</u>: Check Turbine Trip As Follows: (Step 2) • BOTH Turbine Stop Valves - CLOSED OR • All Governor Valves - CLOSED <u>STANDARD</u>: Recognizes the Turbine is NOT Tripped • Both Turbine Stop valves are open • All Governor valves indicate open <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 11</u>: Manually trip the Turbine by simultaneously depressing the THINK and TURBINE TRIP Pushbuttons. (Step 2.a RNO) <u>STANDARD</u>: THINK and TURBINE TRIP Pushbuttons manually depressed. <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT

STEP 12: IF the Turbine will NOT trip, THEN run back Turbine at maximum rate until the Governor Valves are closed. (Step 2.b RNO) STANDARD: Turbine runback at maximum rate is attempted by depressing the following pushbuttons on the EH Turbine Control Panel: • LIMIT ⇓ OR • GV ⇓ AND GV FAST COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 13: IF Turbine can NOT be run back, THEN verify CLOSED the following: (Step 2.c RNO) • All MSIVs • All MSIV BYPs STANDARD: RTGB control switches taken to the CLOSED position for: • MSIVs (V1-3A, B, C) • MSIV Bypasses (MS-353-A, B, C) **EXAMINER'S CUE: After the operator states Immediate Actions are complete, terminate the JPM.** COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________ **TIME CRITICAL STOP TIME: __________**

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The unit is at 100% power. All controls are in auto/normal.
2. No equipment is out-of-service.
3. You are the Reactor Operator and the BOP (the BOP has left the Control Room).

INITIATING CUES:

The CRSS directs you to respond to events as they occur

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-008

VERIFY SAFETY INJECTION ACTUATION

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ____________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Verify Safety Injection Actuation IAW Supplement L
000*009*R5*01

Alternate Path:

Phase A failure to actuate FW Isolation valves and pumps fail to close / stop
SI,RHR Pumps fail to startCR HVAC fails to shift to Emergency Pressurization
EDGs fail to start

Facility JPM #:

CR-008 (Rev. 10)
RO / SRO

K/A Rating(s):

006 K6.03	3.6/3.9	006 A3.06	3.9/4.2
006 A3.02	4.1/4.1	006 A3.07	3.6/3.7
006 A3.05	4.2/4.3	006 A4.07	4.4/4.4

Task Standard:

SAFETY INJECTION ACTUATION VERIFIED IAW SUPPLEMENT L

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant _____ Perform __X__ Simulate _____

References:

1. PATH-1
2. FRP.S.1
3. Supplement L

Validation Time: 20 min. **Time Critical: NO**

Candidate: ____________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT _____ UNSAT _____ Performance Time: ________

Examiner: ____________________ _________________________/_______
NAME SIGNATURE DATE

COMMENTS

Step 1
Critical because isolating Containment provides protection for the health and safety of the public.

Step 2
Critical because potential exists to over fill the S/Gs.

Step 5
Critical because SI Pumps are required to deliver high head borated makeup to maintain the core cool.

Step 7
Critical because improper valve line up prevents delivery of borated makeup.

Step 12
Critical because SW Booster Pump operation prevents CV Atmosphere from entering the SW System during a Design Basis Accident.

Step 16
Critical for Control Room habitability.

Step 17
Critical because operator action is required to ensure the EDGs are started

Step 20
Critical for Control Room habitability.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-215 and activate CAEP 88_JPM_CR_008_R10

2. If IC-215 is not functioning, initialize to IC-5 and perform the following:

   a. Activate malfunctions: SIS01A Type 2
      SIS01B Type 2
      RPS01A Type 2 Mode 3
      RPS01B Type 2 Mode 3
      RCS09A (None 0 0) 1000 5

   b. Allow simulator to RUN to approximately 2000 psig after activation of malfunction RCS09A to allow receipt of annunciators and then initiate manual trips. Then perform Steps 1-6 of FRP-S.1.

   c. After instructor has performed Steps 1-6 of FRP-S.1, then FREEZE simulator.

3. Place the simulator in RUN when directed by the examiner.

4. Mark the flow path up to Step H-2 (FRP-S.1)

SIMULATOR OPERATOR INSTRUCTIONS:

The CAEP will automatically perform the subsequent actions of FRP-S.1 while the operator is performing the JPM

The CAEP has the following triggers included:

- E9 (88_JPM_CR_008): When "C" SI Pump is started, the following actions will occur to prevent overfeeding the S/Gs:
  Reset SI
  Stop "B" AFW Pump
  Close V2-16A, B, C

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

PATH-1
FRP.S.1
Supplement L

READ TO OPERATOR

DIRECTION TO TRAINEE:

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant was originally at 100% power.

2. Due to RCS depressurization, the CRSS directed that a manual reactor trip be initiated. The trip was unsuccessful and resulted in entry of FRP-S-1.

3. The reactor tripped during the performance of FRP-S-1. FRP-S-1 has been completed up to and including Step 6.

4. An SI signal has been generated and sufficient time has passed to allow for safeguards equipment sequencing.

5. You are the Balance of Plant Operator.

INITIATING CUE:

The CRSS has directed you to verify auto start of all SI equipment using Supplement L, Safeguards Auto Action Verification while the crew continues with FRP-S.1.

Hand the operator a copy of Supplement L after he / she locates it.

START TIME: _______

STEP 1: Verify CONTAINMENT ISOLATION PHASE A Valves - CLOSED (Step 1) **STANDARD:** Operator determines: • all Phase A isolation valves are not closed by observing the Phase A status lights not lit Depresses one or both Containment Isolation pushbuttons OR manually isolates valves from the Control Room and/or directs local actions via a dispatched Auxiliary Operator • all Containment Isolation Phase A valves are now closed by observing the status lights illuminated for the Phase A components • RC-550 is closed by observing indication on ERFIS • RC-519A and B are closed by observing the green closed lights above the control switch on the RTGB EXAMINER'S NOTE: **The operator may depress the SI pushbutton(s) to manually initiate SI. Neither pushbutton will cause an SI.** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Verify FW Isolation Valves - CLOSED (Step 2) • FRVs • FRV Bypass Valves • V2-6A, FW HDR SECTION • V2-6B, FW HDR SECTION • V2-6C, FW HDR SECTION **STANDARD:** Operator determines: • the Feed Reg Valves are closed by observing the green closed lights illuminated above the control switches • the Feed Reg Bypass Valves are closed by observing 0% demand and the potentiometer fully counter-clockwise • V2-6A, V2-6B, and V2-6C are **NOT** closed by observing the red open light illuminated above the control switches Operator closes V2-6A, B, and C by placing their control switches in the closed position and observing the green closed lights illuminated EXAMINER'S NOTE: **The operator may elect to place the Feed Reg Valve controllers in manual and/or reduce output to 0%.** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: Verify both FW pumps - TRIPPED (Step 3) **STANDARD:** Operator manually trips both FW pumps by placing their control switches in the Stop position and observing the green stop lights illuminated **COMMENTS:**	___ SAT ___ UNSAT
STEP 4: Check both MDAFW pumps - RUNNING (Step 4) **STANDARD:** Operator determines both MDAFW pumps running by observing the red run lights illuminated and flow indicated on FI-1425 & 1426 and 1425A, B, and C. EXAMINER'S NOTE: **The operator may decide to start the SDAFW pump to supplement the MDAFW pumps. If so, he / she will open V1-8A, B, & C (Steam Supply valves) and then V2-14A, B, & C (Pump Discharge valves).** **COMMENTS:**	___ SAT ___ UNSAT
STEP 5: Verify Two SI Pumps - RUNNING (Step 5) **STANDARD:** Operator determines both SI pumps are not running by observing the green stop lights illuminated Operator manually starts "A" & "C" SI Pumps by placing their control switches to the Start position and observing the red run lights illuminated EXAMINER CUE: **Inform the operator that the crew has reset SI, and adjusted AFW to prevent overfeeding S/Gs** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6: Verify both RHR Pumps - Running (Step 6) **STANDARD:** Operator determines both RHR pumps are not running by observing the green stop lights illuminated Operator manually starts "A" & "B" RHR Pumps by placing their control switches to the Start position and observing the red run lights illuminated **EXAMINER'S NOTE: RCS pressure ~ 850 psig.** **COMMENTS:**	___ SAT ___ UNSAT
STEP 7: Verify SAFETY INJECTION Valves - PROPERLY ALIGNED (Step 7) **STANDARD:** Operator: • determines that all SI valves are properly aligned by observing the SI Status lights illuminated EXCEPT SI-870A & B by observing the SI Status lights and/or the green closed lights above the control switches extinguished RHR-744A & B by observing the SI Status lights and/or the green closed lights above the control switches extinguished • Opens SI-870A & B by placing the control switches in the open position and observing the red open light illuminated • Opens RHR-744A & B by placing the control switches in the open position and observing the red open light illuminated **EXAMINER'S NOTE: Opening RHR-744A&B valves are not required for critical task performance due to RCS pressure being greater than RHR shutoff head** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 8: Check CCW Pumps - AT LEAST ONE RUNNING (Step 8) **STANDARD:** Operator determines "A" CCW pump running by observing the red run light illuminated above the control switch **COMMENTS:**	___ SAT ___ UNSAT

STEP 9: Go to Step 12 (Step 9) **STANDARD**: Operator proceeds to Step 12 of Supplement L **COMMENTS**:	___ SAT ___ UNSAT
STEP 10: Check SW Pumps - LESS THAN 4 RUNNING (Step 12) **STANDARD**: Operator determines < 4 SW Pumps running by observing the green stop light illuminated for "B & D" SW Pumps **COMMENTS**:	___ SAT ___ UNSAT

CAUTION: If only one SW Pump is running, it is subject to runout until the following step is completed.

STEP 11: Check SW System Operation As Follows: (Step 13) a. Check SW Header Pressure - Less than 40 psig **STANDARD**: Operator observes SW pressure >40 psig on PI-1616 & 1684 and proceeds to Step 16 (via the RNO) **EXAMINER'S NOTE: Service Water pressure indicates ~ 52 psig** **COMMENTS**:	___ SAT ___ UNSAT
STEP 12: Verify both SW Booster Pumps - RUNNING (Step 16) **STANDARD**: Operator: • determines "B" SW Booster Pump is not running by observing the green stop light illuminated above the control switch • starts "B" SW Booster Pump by placing the control switch to the start position and observing the red breaker closed light illuminated above the control switch **COMMENTS**:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 13: Verify CV RECIRC FANS - RUNNING (Step 17) • HVH-1 • HVH-2 • HVH-3 • HVH-4 **STANDARD:** Operator determines HVH-1, 2, 3, 4 are running by observing the red breaker closed lights illuminated above each control switch **COMMENTS:**	___ SAT ___ UNSAT
STEP 14: Verify IVSW System - INITIATED (Step 18) • IVSWS VA PCV-1922A • IVSWS VA PCV-1922B **STANDARD:** Operator determines the IVSW System has initiated by observing PCV-1922A and PCV-1022B Status Lights illuminated. **COMMENTS:**	___ SAT ___ UNSAT
STEP 15: Verify CV VENTILATION ISOLATION - INITIATED (Step 19) **STANDARD:** Operator determines: • all CV ventilation valves and/or dampers Status lights are illuminated • V12-10, 11, 12, 13 are closed by observing the green closed lights illuminated above the RTGB control switches **COMMENTS:**	___ SAT ___ UNSAT

STEP 16:	Verify Control Room Ventilation System Has Shifted To Emergency Pressurization Mode As Follows: (Step 20) a. CONT RM AIR EXHAUST Fan, HVE-16 - STOPPED b. CLEANING Fan HVE-19A OR B - RUNNING c. CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1A-SA - CLOSED (indicated by pink status light) d. CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1B-SB - CLOSED (indicated by pink status light)	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Operator determines Control Room ventilation is not aligned for Emergency Pressurization Mode and: a. stops HVE-16 by placing the control switch in the stop position and observing the green breaker open light illuminated b. starts HVE-19A or B by placing the control switch in the start position and observing the red breaker closed light illuminated c. observes the Status lights illuminated for the control room exhaust dampers	
EXAMINER'S NOTE:	**The Control Room Exhaust Dampers (CR-D1A-SA & SB) are interlocked with the Control Room Exhaust Fan (HVE-16) such that they automatically close when the fan is stopped.**	
COMMENTS:		
STEP 17:	Verify both EDGs running (Step 21)	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Operator: • determines "A" & "B" EDG are not running by observing the white Start light extinguished and the green engine stopped light illuminated for each EDG • starts "A" & "B" EDG by placing the control switch to the start position and observing the white Start light illuminated • determines "A" & "B" EDG running by observing the red run light above each EDG control switch illuminated	
EXAMINERS NOTE:	**Operator may elect to dispatch an AO to check out the EDGs first.** **EDGs will prelube for 4 ½ minutes before EDG starts. Operator may elect to continue with Supplement L but must verify EDGs RUNNING for successful completion of this step.**	
COMMENTS:		

STEP 18: Check CV Pressure - REMAINED BELOW 20 PSIG (Step 22) **STANDARD:** Operator checks available CV Pressure indications (RTGB, AR-100C, ERFIS)and determines CV pressure has remained below 20 psig. **EXAMINER'S NOTE: CV pressure indicates ~ 3 psig** **COMMENTS:**	___ SAT ___ UNSAT
STEP 19: Check Steam Line Isolation - INITIATED (Step 23) **STANDARD:** Operator determines Steam Line Isolation has not occurred and is not required by observing: • bistables extinguished associated with: CV Hi-Hi Pressure High Steam Flow and Low Tave or Low S/G Pressure • MSIVs red open lights illuminated Operator then transitions to Step 25 (via the RNO) **COMMENTS:**	___ SAT ___ UNSAT
STEP 20: At MCC-5, open breaker AUX BUILDING SUPPLY FAN, HVS-1 (CMPT-7J) (Step 25) **STANDARD:** Operator contacts Auxiliary Operator and directs him to open breaker at MCC-5 / CMPT 7J **BOOTH OPERATOR: When directed, open the breaker for HVS-1 (EPS 214) & report to the control room the breaker is open.** **COMMENTS:**	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 21:	Return To Procedure And Step In Effect. (step 21.)	
STANDARD:	Operator informs CRSS that Supplement L is complete.	___ SAT
COMMENTS:		
	END OF TASK	___ UNSAT

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The plant was originally at 100% power.

2. Due to RCS depressurization, the CRSS directed a manual reactor trip be initiated. The trip was unsuccessful and resulted in FRP-S.1 entry.

3. The reactor tripped during the performance of FRP-S-1. FRP-S-1 has been completed up to and including Step 6.

4. An SI signal has been generated and sufficient time has passed to allow for safeguards equipment sequencing.

5. You are the Balance of Plant Operator.

INITIATING CUE:

The CRSS has directed you to verify auto start of all SI equipment using Supplement L, Safeguards Auto Action Verification.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-009

Remove Power Range Channel N-44 From Service

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place an Excore Nuclear Instrumentation Channel in and out of service IAW OWP-011
015*004*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-009
RO / SRO

K/A Rating(s):

015 A4.02 3.9/3.9
015 A4.03 3.8/3.9

Task Standard:

Power Range Channel NI-44 removed from service IAW with OWP-011, NI-4

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OWP-011, NI-4

Validation Time: 12 min. **Time Critical:** NO

Candidate: ________________________________
NAME

Time Start: ______
Time Finish: ______

Performance Rating: SAT ______ UNSAT ______

Performance Time: ______

Examiner: ________________________ ________________________ /________
NAME SIGNATURE DATE

COMMENTS

Step 6
Critical because operator action is required to bypass the NI-44 Dropped Rod signal

Step 8
Critical because operator action is required to place the NI-44 Power Range High Flux Trip in the tripped condition

Step 10, 11, 12
Critical because operator action is required to defeat NI-44 from the Rod Stop and QPTR circuitry

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-5, go to RUN ensure plant conditions are stable.
2. Place the simulator in FREEZE.
3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

OWP-11, NI-4.

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The plant is at 100% power
2. No equipment is out of service
3. I&C has requested N-44 be taken out of service to replace the high voltage power supply
4. You are the BOP Operator

INITIATING CUES:

You are directed by the CRSS to remove N-44 from service IAW OWP-011, NI-4.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OWP-11, NI-4 **Hand the operator a copy of the procedure once he/she locates it.** COMMENTS:	_____ SAT _____ UNSAT
STEP 2: Review Precaution section on Page 1 (OWP-11, NI-4, page 1) STANDARD: Operator reviews precautions associated with removing NI-44 from service COMMENTS:	_____ SAT _____ UNSAT
STEP 3: Remove NI-44 from ERFIS scan: NIN0044A** (Page 3, 1st Step) STANDARD: NI-44 removed from ERFIS scan, and initialed **EXAMINER CUE: The STA will remove NI-44 from ERFIS scan** COMMENTS:	_____ SAT _____ UNSAT
STEP 4: NIS CHANNEL SELECTOR NR 45 PEN 1 and 2*** (2nd & 3rd Step) STANDARD: On the RTGB, the Channel Selector switches for the NR-45 Recorder Pens selected to any other NI (1 PR, 1 IR) NOT removed from service and recorded / initialed COMMENTS:	_____ SAT _____ UNSAT

STEP 5: 1/QM-408 Switch (in Rack No. 28): POWER MISMATCH DEFEATED (4th Step) STANDARD: 1/QM-408 Switch (in Rack No. 28) selected to DEFEAT **EXAMINER'S CUE: When operator determines Key #10 is required, inform him/her that Power Mismatch 1/QM-408 has been defeated and verified** COMMENTS:	____ SAT ____ UNSAT
STEP 6: DROPPED ROD MODE Switch: BYPASS (5th Step) STANDARD: On NI-44, NI-44 DROPPED ROD MODE Switch selected to BYPASS **EXAMINER NOTE: APP-005-D4, NIS TRIP/DROP ROD BYPASS alarms when switch is taken to bypass** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: NIS ROD DROP BYPASS NI-44 Status Light: ILLUM (6th Step) STANDARD: Operator determines the NIS ROD DROP BYPASS NI-44 Status Light is illuminated COMMENTS:	____ SAT ____ UNSAT
STEP 8: NI-44 OUT OF SERVICE TRIP SWITCH: TRIPPED (7th Step) STANDARD: In the back of the NI-44 cabinet, the operator positions the NI-44 OUT OF SERVICE TRIP SWITCH to the TRIPPED position. Operator determines verification is not required due to the bistable light not being lit prior to positioning NI-44 OUT OF SERVICE TRIP SWITCH **EXAMINER'S NOTE: This defeats the Power Range High Flux Trip** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 9:	Bistable Light HI POW RANGE HI FLUX NC44R: ILLUM (8th Step)	
STANDARD:	Operator determines Bistable Light HI POW RANGE HI FLUX NC44R is illuminated.	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	ROD STOP BYPASS Switch: BYPASS PR 44 (9th Step)	**CRITICAL STEP**
STANDARD:	On the Miscellaneous Control & Indication Panel , the operator places the ROD STOP BYPASS Switch to the BYPASS PR 44 position.	____ SAT
COMMENTS:		____ UNSAT
STEP 11:	COMPARATOR CHANNEL DEFEAT Switch: SELECT PR 44 (10th Step)	**CRITICAL STEP**
STANDARD:	On the Miscellaneous Control & Indication Panel, the operator places the COMPARATOR CHANNEL DEFEAT Switch to the SELECT PR 44 position	____ SAT
COMMENTS:		____ UNSAT
STEP 12:	DETECTOR CURRENT COMPARATOR DRAWER: UPPER and LOWER SECTION Switch: SELECT PR 44*** (11th Step)	**CRITICAL STEP**
STANDARD:	On the DETECTOR CURRENT COMPARATOR DRAWER, the operator selects PR 44 with the Upper and Lower Section switches.	____ SAT
COMMENTS:		____ UNSAT

STEP 13: NI-44 INSTRUMENT POWER FUSES**: REMOVED (12th Step) STANDARD: Operator determines this step is not required. **EXAMINER'S NOTE: This action is N/A if power is > P-10 or the reactor is in MODES 3 through 6 (ITS Table 3.3.1-1)** COMMENTS:	____ SAT ____ UNSAT
STEP 14: Bistable Light LOW POW RANGE HI FLUX NC44P: ILLUM (13th Step) STANDARD: Operator determines this step is not required. **EXAMINER'S NOTE: This bistable is normally in the tripped condition (illuminated) at this power level. The operator may initial this step accordingly.** COMMENTS: **END OF TASK**	____ SAT ____ UNSAT

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The plant is at 100% power
2. No equipment is out of service
3. I&C has requested a clearance on N-44 to replace the high voltage power supply
4. You are the BOP Operator

INITIATING CUES:

You are directed by the CRSS to remove N-44 from service IAW OWP-011, NI-4.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-035

PZR PRESSURE CONTROL MALFUNCTION

CANDIDATE ____

EXAMINER ____

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Respond to a PZR Pressure Control Malfunction.
000*027* 05*01

Alternate Path:

CVC-311 failed open, must isolate normal charging to stop RCS depressurization

Facility JPM #:

JPM CR-035
RO \ SRO

K/A Rating(s):

027 AK3.03	3.7/4.1
027 AA2.04	3.7/4.3
027 AA2.02	3.8/3.9

Task Standard:

The Operator will be required to respond to a PZR CONTROL HI/LO PRESS alarm, perform actions of AOP-019, and identify valve CVC-311 as the cause of depressurization.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant _____ Perform __X__ Simulate _____

References:

AOP-019, MALFUNCTION OF RCS PRESSURE CONTROL

Validation Time: 15 min. **Time Critical:** No

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT _____ UNSAT _____ Performance Time: ________

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

COMMENTS

Step 2, 3
Critical because Step 1 and 2 are Immediate Actions required to be performed by memory

Step 13
Critical because the operator must determine CVC-311 being failed open is the cause of the unanticipated RCS pressure decrease

Step 15
Critical because operator action is required to secure normal letdown

Step 17
Critical because operator action is required to reduce charging flow to minimum

Step 18
Critical because closing HCV-121 (without exceeding the Charging Pump Relief setpoint) stops the RCS pressure decrease

Step 22
Critical because operator action is required to open CVC-387

Step 23
Critical because operator action is required to open HIC-137 (without exceeding 195°F)

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-216 and activate CAEP 88_JPM_CR_035_R8
2. Otherwise initialize to IC-5 and perform the following:
   a. MFP PRS05A (None 0 0) 0, Pzr B/U Htr GP A - OFF
   b. MFP PRS05B (None 0 0) 0, Pzr B/U Htr GP B - OFF
   c. MFP CVC18 (None 0 0) 100, Fail CVC-311(Aux Spray Valve) to full open
   d. Place simulator in RUN
   e. Start a second charging pump and open CVC-200B
   f. When APP-003-D8 alarms, close CVC-200B, stop one charging pump
   g. Override Annunciator APP-003-D8 OFF, then place simulator in FREEZE
3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

APP-003-D8
AOP-019

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

You are the Unit 2 Control Operator

Plant is at 100% power

No equipment is out of service

INITIATING CUES:

You are to respond to events as they occur.

START TIME: _______

EXAMINER'S NOTE: **Annunciator APP-003-D8 will alarm ~10 seconds after the simulator is placed in RUN**

Operator may directly enter AOP-019 and perform the Immediate Actions without consulting APP-003-D8.

APP-003	
STEP 1: Operator refers to APP-003-D8.	
STANDARD: Operator checks possible causes and determines entry into AOP-019 is required. 1. Plant transient **(NONE)** 2. Pressure Controller Malfunction/Spray Valve failure **(MAY OBSERVE AUX SPRAY VALVE OPEN)** 3. Transmitter failure (PT-445) **(RESPONDING NORMALLY)** 4. Excessive RCS leakage (low) **(NONE)** Observes: 1. Pressurizer Pressure (PI-444, PI-445, PI-455, PI-456 and PI-457) 2. PC-444J output 3. Generator Load/Reactor Power 4. Spray Valve Position **(MAY OBSERVE AUX SPRAY VALVE OPEN)** Actions: 1. IF Pressure Controller OR Spray Malfunction, THEN Refer To AOP-019	____ SAT ____ UNSAT
COMMENTS:	

NOTE: AOP-019, Steps 1 and 2 are Immediate Action steps.

STEP 2: Determine If PZR PORVs Should Be Closed. (Step 1) a. Check PZR pressure - LESS THAN 2335 PSIG. b. Verify Both PZR PORVs - CLOSED STANDARD: Operator determines PZR Pressure is less than 2335 PSIG. Operator verifies both PZR PORVs closed by observing the green lights illuminated for PCV-455C and 456. **EXAMINER'S NOTE: The operator may observe PRT parameters. (Possible leaking PORV)** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 3: Control The PZR SPRAY VALVES AND PZR Heaters To Restore RCS Pressure To The Desired Control Band. (Step 2) STANDARD: Operator determines: • PZR spray valves are closed by observing the green lights illuminated for PCV-455A and 455B • Control and both Backup heater groups on by observing the red lights illuminated above the RTGB control switches **EXAMINER'S NOTE: Operator may observe the Auxiliary Spray valve open by observing the red light illuminated above the RTGB control switch for CVC-311.** **After the operator performs Steps 1 and 2, hand him / her a copy of AOP-019.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 4: Check PZR Pressure - UNDER OPERATOR CONTROL (Step 3) STANDARD: Operator determines PZR Pressure is NOT under operator control. COMMENTS:	____ SAT ____ UNSAT

STEP 5: IF PZR Pressure approaches a Reactor Trip Setpoint, THEN trip the Reactor and Go To Path-1. (Step 3 RNO) • Low PZR Pressure - 1844 psig • High PZR Pressure - 2376 psig • OTΔT - Variable (TR-412) STANDARD: Operator determines Pressurizer pressure is not approaching a reactor trip setpoint. COMMENTS:	____ SAT ____ UNSAT
STEP 6: Check PC-444J, PZR PRESS - OPERATING PROPERLY IN AUTO (Step 4) STANDARD: Operator determines PC-444J is operating properly in auto. COMMENTS:	____ SAT ____ UNSAT
STEP 7: Go To Step 8 (Step 5) STANDARD: Operator proceeds to Step 8. COMMENTS:	
STEP 8: Check RCS pressure - LESS THAN REQUIRED FOR CURRENT PLANT CONDITIONS (Step 8) STANDARD: Operator determines RCS pressure less than required. **EXAMINER'S NOTE: RCS pressure indicates ~ 2180 psig and slowly decreasing** COMMENTS:	____ SAT ____ UNSAT

STEP 9: Check PZR Pressure - LESS THAN 2205 PSIG (Step 9) STANDARD: Operator determines PZR Pressure is less than 2205 psig **EXAMINER'S NOTE: PZR pressure indicates ~ 2170 psig** COMMENTS:	____ SAT ____ UNSAT
STEP 10: Restore Pressure Within 2 HOURS OR Be In Mode 2 Within 6 HOURS (Step 10) STANDARD: Operator acknowledges requirement to restore pressure within 2 hours or be in Mode 2 within 6 hours COMMENTS:	____ SAT ____ UNSAT
STEP 11: Check Both PZR SPRAY VALVES - CLOSED (Step 11) STANDARD: Operator determines both PZR Spray Valves closed by observing the green lights illuminated for above the RTGB control switches COMMENTS:	____ SAT ____ UNSAT
STEP 12: Observe The CAUTION Prior To Step 17 and Go To Step 17 (Step 12) STANDARD: Operator proceeds to Step 17 COMMENTS:	

CAUTION: With HCV-121, CHARGING FLOW Valve closed, throttling Seal Injection Flow will cause the Charging Pump Relief Valves to lift.

STEP 13: Check CVC-311, AUX PZR SPRAY Valve - CLOSED (Step 17) STANDARD: Operator determines CVC-311 is open by observing the Red light illuminated above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 14: Verify CVC-311 Control Switch is SELECTED TO CLOSE (Step 17 RNO) STANDARD: Operator verifies CVC-311 control switch is in the CLOSED position COMMENTS:	____ SAT ____ UNSAT
STEP 15: Close CVC-460A AND CVC-460B, LTDN LINE STOP (Step 17.a RNO) STANDARD: Operator places the control switch for CVC-460A and CVC-460B in the close position and verifies the valves are closed by observing the green lights illuminated above the RTGB control switch **EXAMINER'S NOTE: CVC-460A & B are controlled by the same RTGB control switch.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 16: Verify only one charging pump is RUNNING (Step 17.b RNO) STANDARD: Operator determines only one charging pump is running COMMENTS:	____ SAT ____ UNSAT

STEP 17:	Place running charging pump controller in MAN and adjust to minimum speed (Step 17.c RNO)	**CRITICAL STEP**
STANDARD:	Operator places the controller for the "C" Charging Pump in manual and adjusts demand to 0 speed	____ SAT
COMMENTS:		____ UNSAT
STEP 18:	Close HCV-121, CHARGING FLOW Valve by slowly adjusting controller HIC-121 to 100% demand while maintaining Charging Pump Discharge pressure less than 2500 PSIG (Step 17.d RNO)	**CRITICAL STEP**
STANDARD:	HCV-121 adjusted to 100% demand by rotating the potentiometer in the clockwise direction and observing HCV-121 demand meter while maintaining Charging Pump Discharge pressure (PI-121) < 2500 psig	____ SAT
EXAMINER'S NOTE:	**HCV-121 operation ... 0% - open - counter-clockwise 100% - closed - clockwise Charging pump discharge pressure remains at ~ 2250 psig**	____ UNSAT
COMMENTS:		
STEP 19:	Perform Attachment 2, Placing Excess Letdown In Service (Step 17.e RNO)	
STANDARD:	Operator proceeds to Attachment 2	____ SAT
EXAMINER'S CUE:	**CRSS directs you to perform Attachment 2**	
COMMENTS:		____ UNSAT

STEP 20:	Verify CC-739, CCW FROM EXCESS LTDN HX - OPEN (Attachment 2, Step 1)	
STANDARD:	Operator determines CC-739 is open by observing red light illuminated above the RTGB control switch	____ SAT
COMMENTS:		____ UNSAT
STEP 21:	Verify CVC-389, EXCESS LTDN DIV, - IN THE DRN TK POSITION (Step 2)	
STANDARD:	Operator determines CVC-389 is in the DRAIN TANK position by observing the white light illuminated at the RTGB control switch	____ SAT
COMMENTS:		____ UNSAT
STEP 22:	Open CVC-387, EXCESS LTDN STOP (Step 3)	**CRITICAL STEP**
STANDARD:	Operator opens CVC-387 by placing the control switch to open and observing red light illuminated above the control switch	____ SAT
COMMENTS:		____ UNSAT

CAUTION: IF Excess Letdown Heat Exchanger outlet temperature exceeds 195°F, THEN damage could result.

STEP 23: Slowly open HIC-137, EXCESS LTDN FLOW (Step 4) STANDARD: Operator slowly adjusts the potentiometer for HIC-137 in the open (clockwise) direction while observing Excess Letdown Heat Exchanger outlet temperature on TI-139 **EXAMINER'S NOTE: HIC-137 adjusted to ~80% demand will cause temperature on TI-139 to be ~195°F** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 24: Check Excess Letdown Heat Exchanger Outlet Temperature - GREATER THAN 195°F (Step 5) STANDARD: Operator determines TI-139 < 195°F and proceeds to Step 7 **BOOTH INSTRUCTOR'S CUE: When called, acknowledge the Waste Disposal Panel alarm. Report RCDT Hi level , "B" RCDT Pump running in automatic.** COMMENTS:	____ SAT ____ UNSAT

NOTE: PZR level will increase if total Charging flow exceeds total Letdown flow AND RCP Seal Leakoff flow.

STEP 25: Check PZR Level - INCREASING (Step 7) STANDARD: Operator determines PZR level is not increasing and proceeds to Step 10 (via the RNO) **EXAMINER'S NOTE: If operator determines PZR level is increasing, perform steps 8 and 9, (JPM Steps 26 and 27). Otherwise, go to step 10 (JPM Step 28)** COMMENTS:	____ SAT ____ UNSAT

STEP 26: Verify The Running Charging Pump - AT MINIMUM SPEED (Step 8) STANDARD: Operator determines "C" Charging Pump is in manual COMMENTS:	____ SAT ____ UNSAT
STEP 27: Contact Chemistry To Purge The PZR Liquid Sample Line With Full Flow To The VCT Using CP-003, Systems Sampling Procedure (Step 9) STANDARD: Operator requests control room supervision or contacts Chemistry to purge the PZR liquid sample line with full flow to the VCT per CP-003 **EXAMINER CUE: If requested as control room supervision, acknowledge lining up the PZR liquid sample line to the VCT with full flow per CP-003.** **BOOTH INSTRUCTOR CUE: If Chemistry is contacted, acknowledge lining up the PZR liquid sample line to the VCT with full flow per CP-003** COMMENTS:	____ SAT ____ UNSAT
STEP 28: Check PZR Level - GREATER THAN 63% (Step 10) STANDARD: Operator determines PZR level < 63% by observing LI-459, 460, 461 and proceeds to Step 12 (via the RNO) COMMENTS:	____ SAT ____ UNSAT
STEP 29: Check PZR Level - APPROACHING 91% (Step 12) STANDARD: Operator determines PZR level is not approaching 91% and proceeds to Step 14 (via the RNO) COMMENTS:	____ SAT ____ UNSAT

STEP 30: Inform the CRSS That Excess Letdown Is In Service AND That Continuous Action Steps Are In Effect (Step 14)
 	
STANDARD: CRSS informed that Excess Letdown is in service and continuous action steps are in effect.
 	
EXAMINER'S CUE: Acknowledge that Excess Letdown is in service and continuous actions are in effect.
 	
EXAMINER'S NOTE: Continuous actions as follows:
• **If PZR level increases:**
  • **verify charging pump at minimum speed**
  • **contact Chemistry to purge the PZR liquid sample line with full flow to the VCT**
• **If PZR level > 63%, reduce to < 63% or be in Mode 3 with the Trip breakers open within 6 hours and be in Mode 4 within 12 hours**
• **If PZR level is approaching 91%, trip the reactor and go to PATH-1**
 	
COMMENTS:
	____ SAT
	
	____ UNSAT

STEP 31: Go to Step 26 (Step 17.f RNO) STANDARD: Operator proceeds to Step 26 COMMENTS:	____ SAT ____ UNSAT
STEP 32: Implement the EALs (Step 26) STANDARD: Operator informs the Superintendent Shift Operations to implement the EALs **EXAMINER'S CUE: Acknowledge as the Superintendent Shift Operations to implement the EALs** COMMENTS:	____ SAT ____ UNSAT

STEP 33: Contact I&C To Make Repairs To The PZR Pressure Control System (Step 27) STANDARD: Operator informs Control Room supervision to contact I&C for repairs to CVC-311 **EXAMINER'S CUE: Acknowledge as the Control Room supervision to contact I&C to make repairs to CVC-311** **BOOTH INSTRUCTOR CUE: If called, respond as I&C or the WCC SRO and acknowledge initiate repairs to CVC-311** COMMENTS:	____ SAT ____ UNSAT
STEP 34: Refer to ITS For Applicable LCOs (Step 28) • LCO 3.4.11, PZR PORV • TRM 3.4, PZR Spray ΔT • LCO 3.4.4 and 3.4.5, RCS Loops • LCO 3.4.1, RCS Pressure • LCO 3.4.9, PZR Level STANDARD: Operator informs Control Room supervision to refer to ITS / TRM **EXAMINER'S NOTE: Acknowledge as Control Room supervision or tell the operator that someone else will refer to ITS / TRM** COMMENTS: **END OF TASK**	____ SAT ____ UNSAT

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Unit 2 Control Operator

Plant is at 100% power

No equipment is out of service

INITIATING CUES:

You are to respond to events as they occur.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-039

Place Low Temperature Overpressure Protection in Service When > 350 °F

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Place the LTOP System in sevice when the RCS is >350°F IAW OP-006
002*018*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-039
RO / SRO

K/A Rating(s):

010 000 A4.03	4.0/3.8
010 000 GEN.9	3.6/3.5
010 000 GEN.13	3.5/3.7

Task Standard:

LTOP placed in service IAW OP-006, section 5.2

Preferred Evaluation Location:

Simulator __X__ In-Plant _____

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

OP-006, section 5.2

Validation Time: 20 min. **Time Critical:** NO

Candidate: ________________________________
NAME

Time Start : ________
Time Finish: ________

Performance Rating: SAT _____ UNSAT _____

Performance Time: ________

Examiner: __________________________ ______________________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because Instrument Air must be isolated to satisfy stroke time surveillance requirement

Step 5
Critical because isolation of the PZR PORVs prior to stroking them prevents an undesirable RCS depressurization

Step 6
Critical because stroke open time affects PZR PORV(s) operability

Step 8
Critical because failure to close either PZR PORV would cause an undesirable RCS depressurization

Step 9
Critical because opening the PORV Block Valves is required to place LTOP in service

Step 10
Critical because placing the PZR PORV control switches in AUTO configures the circuitry for automatic actuation

Step 11
Critical because Instrument Air must be aligned for PZR PORV operability

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-23
2. Go to RUN and allow conditions to stabilize, then go to FREEZE
3. Update Control Room Status Board to IC-23 Chemistry Sheet
4. Place simulator in RUN when directed by the examiner

SIMULATOR OPERATOR INSTRUCTIONS:

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-006, section 5.2.1 completed
Calibrated stop watch

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. A plant cooldown from hot shutdown to cold shutdown IAW GP-007 is to be performed.
2. RCS temperature is 548 °F and pressure is 2240 psig.
3. You are the Reactor Operator.
4. An Auxiliary Operator is standing by in the Containment awaiting instructions.

INITIATING CUES:

Place the Low Temperature Overpressure Protection system in service IAW OP-006, Section 5.2, beginning with step 5.2.2. Maintenance has not been performed on the Pressurizer PORV Pneumatic System.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-006. ***Hand the operator a calibrated stop watch and the copy of OP-006 (with section 5.2.1 completed).*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: IF maintenance has been performed on the PZR PORV Pneumatic System, THEN align system IAW Section 5.1 of this procedure. (Step 5.2.2.1) STANDARD: Operator marks this step N/A, no maintenance performed. COMMENTS:	____ SAT ____ UNSAT
STEP 3: Check PI-1726 & 1727 indicate between 95 and 99 psig. (Step 5.2.2.2, 3) STANDARD: Operator directs Auxiliary operator (AO) inside Containment (CV) to check pressure on PI-1726 & 1727 between 95 and 99 psig.. **BOOTH INSTRUCTOR'S CUE: When directed to check PI-1726 & 1727, report pressure for each indicates 98 psig.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: Close OPP-2 & 1, AIR SUPPLY (Step 5.2.2.4, 5) STANDARD: Operator directs AO inside CV to close OPP-2 & OPP-1. **BOOTH INSTRUCTOR'S CUE: When directed, report OPP-2 & 1 are closed.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 5: Close PORV Block Valves (Step 5.2.2.6.a. & b) a. RC-535 b. RC-536 STANDARD: RC-535 & 536 closed as indicated by illuminated green light only on the RTGB control switches. **EXAMINER'S NOTE: Annunciators APP-003-A3 and A2 will alarm due to RC-535 & 536 being closed.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Acceptance criteria for OPEN stroke time of PCV-455C and PCV-456 is 2.5 seconds.

STEP 6: Time open PCV-455C and PCV-456 (Step 5.2.2.7) STANDARD: One at a time, PCV-455C & 456 will be timed open by simultaneously activating the stop watch and positioning the RTGB control switch to the open position. When the Red light only is illuminated, the stop watch will be de-activated and the stroke time recorded in the procedure. **EXAMINER'S NOTE: Annunciator APP-003-D6 will alarm due to opening PCV-455C & 456.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: IF PCV-455C or PCV-456 do not meet acceptance criteria, THEN perform the following: (Step 5.2.2.8) a. Declare the valve(s) not meeting the acceptance criteria inoperable b. Perform the REQUIRED ACTIONS of ITS LCO 3.4.11 for an inoperable PORV c. Write a work request for inoperable valve(s) STANDARD: Operator determines acceptance criteria is satisfied for both PZR PORVs COMMENTS:	____ SAT ____ UNSAT

STEP 8:	Close Pressurizer Power Operated Relief Valves (Step 5.2.2.9) a. PCV-455C b. PCV-456	**CRITICAL STEP**
STANDARD:	PCV-455C & 456 closed as indicated by green light only illuminated on the RTGB control switch.	____ SAT
COMMENTS:		____ UNSAT
STEP 9:	Open PORV Block Valves (Step 5.2.2.10) RC-535	**CRITICAL STEP**
STANDARD:	RC-535 open as indicated by red light only illuminated on the RTGB control switch RC-536 closed as indicated by the green only light on the RTGB control switch	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Return control switches for PZR PORVs to AUTO position. (Step 5.2.2.11) a. PCV-455C b. PCV-456	**CRITICAL STEP**
STANDARD:	PCV-455C & 456 control switches positioned to AUTO.	____ SAT
COMMENTS:		____ UNSAT
STEP 11:	Open OPP-2, & 1. (Step 5.2.2.12, 13)	**CRITICAL STEP**
STANDARD:	Operator directs AO inside CV to open OPP-2 & OPP-1, AIR SUPPLY	
BOOTH INSTRUCTOR'S CUE:	**When directed, report OPP-2 & 1 are open and independently verified.**	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. A plant cooldown from hot shutdown to cold shutdown IAW GP-007 is to be performed.
2. RCS temperature is 548/F and pressure is 2240 psig.
3. You are the Reactor Operator.
4. An Auxiliary Operator is standing by in the Containment awaiting instructions.

INITIATING CUES:

Place the Low Temperature Overpressure Protection system in service IAW OP-006, Section 5.2, beginning with step 5.2.2. Maintenance has not been performed on the Pressurizer PORV Pneumatic System.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-071

ESTABLISH RCS BLEED AND FEED

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ____________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

ESTABLISH RCS BLEED AND FEED (ONE PORV) IAW FRP-H.1
311*006*R6*01

Alternate Path:

1 PZR PORV will not open

Facility JPM #:

JPM CR-071
RO / SRO

K/A Rating(s):

002 000 A2.04 4.3/4.6

Task Standard:

RCS bleed and feed has been established by completion of FRP-H.1 up through and including establishing an RCS bleed path.

Preferred Evaluation Location: Simulator __X__ In-Plant ______

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

FRP-H.1, Response to Loss of Secondary Heat Sink

Validation Time: 12 min. **Time Critical: YES (8 min.)**

Candidate: ______________________
NAME

	Overall Time	Critical Time
	Time Start: ________	Start: ________
	Time Finish: ________	Finish: ________
Performance Time (min):	________	________

Examiner: ______________________ ______________________ /________
NAME SIGNATURE DATE

COMMENTS

Steps 5 through 14
Time Critical because Heat Sink must be established in a timely manner to prevent core damage.

Step 4
Critical because operator action is required to stop the RCPs (unnecessary heat input to the RCS)

Step 5
Critical because operator action is required to initiate SI

Step 10
Critical because IA is needed to operate the PZR PORVs

Step 11
Critical because operator action is required to establish a vent path for PZR

Step 12
Critical because BOTH PORVs must be open to provide adequate bleed path.

Step 13
Critical because operator action is required to open the Head Vent Valves (adequate bleed path with 1 PORV inoperable)

Step 14
Critical because operator action is required to depressurize at least 1 intact S/G (depressurize RCS < SI Pump shutoff head)

SIMULATOR OPERATOR INSTRUCTIONS:

Initialize the simulator to IC-217 and go to RUN.

Otherwise reset simulator to IC-5, go to RUN, and perform the following:

- Insert malfunction RPS1A and RPS1B failure to trip - Auto Only
- Activate MFI CFW-19 (total loss of feedwater).
- When SG WR levels <45% then manually trip the reactor
- Activate MFI PRS03C (None 0 0) 0 PCV-456 Fail Closed
- Verify 2 charging pumps Running
- Freeze the simulator after SG WR levels are less than 26%

Give the Examiner Keys #81 through 86

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

FRP-H.1, Response to Loss of Secondary Heat Sink

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant was initially at 100% power.

2. Loss of both main feedwater pumps caused reactor and turbine trip

3. Unavailability of AFW pumps has led to a "RED" condition on heat sink CSFST

4. You are the Reactor Operator.

INITIATING CUES:

The CRSS has directed you to perform actions IAW FRP-H.1, Response To Loss Of Secondary Heat Sink up to isolating the SI Accumulators

START TIME: _______

CAUTION: Feed flow is not re-established to any faulted S/G if an intact S/G is available.

STEP 1:	Check Total Feed Flow - LESS THAN 300 GPM DUE TO OPERATOR ACTION (Step 1)	
STANDARD:	Operator determines total feed flow < 300 gpm and not due to operator action, proceeds to Step 3 (via the RNO).	___ SAT
COMMENTS:		___ UNSAT
STEP 2:	Determine If Secondary Heat Sink Is Required As Follows: (Step 3) a. Check RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE. b. Check RCS temperature - GREATER THAN 350°F [310°F]	___ SAT
STANDARD:	Operator determines: a. RCS pressure is greater than non-faulted S/G pressure. b. RCS temperature is greater than 350°F.	___ UNSAT
COMMENTS:		
STEP 3:	Check Any Two S/G Wide Range Levels - LESS THAN 26% [37%] (Step 4)	
STANDARD:	Operator identifies that all 3 S/G Wide Range levels are less than 26%	___ SAT
COMMENTS:		___ UNSAT

STEP 4:	Perform The Following: (Step 5) a. Stop all RCPs b. Observe CAUTION prior to Step 28 and Go To Step 28	**CRITICAL STEP**
STANDARD:	Operator: a. Places control switches for A, B, and C RCPs to STOP, observes breakers open by observing the illuminated green lights above the control switches b. Proceeds to Step 28 and acknowledges CAUTION	___ SAT ___ UNSAT
COMMENTS:		

CAUTION: Steps 28 though 35 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.

TIME CRITICAL START TIME: ________

STEP 5:	Initiate SAFETY INJECTION As Follows: (Step 28) a. Depress the INITIATE SAFETY INJECTION Pushbutton b. Note the time SI initiated	**CRITICAL STEP**
STANDARD:	Operator: a. Depresses either INITIATE SAFETY INJECTION Pushbutton b. Notes the time SI initiated	__ SAT ___ UNSAT
COMMENTS:	**Record SI Initiated Time: ______**	

STEP 6: Verify RCS Injection Path As Follows: (Step 29) a. Verify SI Pumps - AT LEAST ONE RUNNING b. Verify SI Valves for at least one flow path - ALIGNED FOR COLD LEG INJECTION STANDARD: Operator observes: a. "A" and "B" SI pumps running by observing the red breaker closed lights illuminated above the control switches b. SI-870 "A" and/or "B" open by observing the red open light above the control switches **EXAMINER'S NOTE: The operator may observe all SI valves aligned as required using the SI Status lights on the RTGB.** COMMENTS:	___ SAT ___ UNSAT
STEP 7: Check Time Elapsed Since SI Initiation - 2 MINUTES (Step 30) STANDARD: Operator determines < 2 minutes have elapsed since SI initiation and proceeds to Step 33 (via the RNO) **EXAMINER'S NOTE: When at least 2 minutes have elapsed since the time recorded in JPM Step 5, the operator will come back to JPM Steps 8 and 9 to reset SI, CV Spray, Phase A & B.** **Go to JPM Step 10 (Step 33)** COMMENTS:	___ SAT ___ UNSAT
STEP 8: Reset the Following: (Step 31) • SAFETY INJECTION • CONTAINMENT SPRAY STANDARD: Operator depresses: • SAFETY INJECTION RESET Pushbutton • CONTAINMENT SPRAY RESET Pushbutton COMMENTS:	___ SAT ___ UNSAT

STEP 9:	Reset The Following Containment Isolations: (Step 32) a. PHASE A b. PHASE B	
STANDARD:	Operator depresses: a. PHASE A RESET Pushbutton b. PHASE B RESET Pushbutton	___ SAT
COMMENTS:		___ UNSAT

STEP 10:	Establish Instrument Air To CV As Follows: (Step 33) a. Verify APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED b. Place IA PCV-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position	**CRITICAL STEP**
STANDARD:	Operator: a. Verifies APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED b. Places IA PCV-1716, INSTRUMENT AIR ISO TO CV Control Switch to the OVERRIDE position	___ SAT
COMMENTS:		___ UNSAT

STEP 11:	Establish RCS Bleed Path As Follows: (Step 34) a. Verify power to PZR PORV Block Valves - AVAILABLE. b. Place all PZR Heater Control Switches to the OFF position c. Verify PZR PORV Block Valves - BOTH OPEN d. Open both PZR PORVs	**CRITICAL STEP** ___ SAT
STANDARD:	Operator: a. Identifies power is available to PZR PORV Block Valves by observing red open indication lights illuminated b. Places all PZR Heater Control Switches to the OFF position c. Determines PZR PORV Block Valves open by observing red open indication lights above illuminated d. Opens both PZR PORVs	___ UNSAT
EXAMINER'S NOTE:	**Only b. and d. (above) are critical steps** **The operator should observe PZR PORV PCV-456 does not open**	
COMMENTS:		

STEP 12:	Verify Adequate RCS Bleed Path As Follows: (Step 35) • PZR PORVs - BOTH OPEN • PZR PORV Block Valves - BOTH OPEN	**CRITICAL STEP**
STANDARD:	Operator: • Determines PZR PORV PCV-456 is not open by observing the green shut light illuminated above the control switch • Determines PZR PORV Block Valves are both open by observing the red open light illuminated above their control switches • Acknowledges NOTE prior to step 37 and goes to step 37 (via the RNO)	___ SAT ___ UNSAT
EXAMINER'S CUE:	**After operator reads the note (below) regarding keys 81 through 86, hand him / her the keys**	
COMMENTS:		

NOTE: Key numbers 81 through 86 are required to operate the Head and PZR Vent Valves below.

STEP 13:	Place the Key Switches for the following Vent Valves to the OPEN Position: (Step 37) • RC-568, HEAD VENT • RC-570, PZR VENT • RC-572, CV ATMOS • RC-567, HEAD VENT • RC-569, PZR VENT • RC-571, PRT ISO	**CRITICAL STEP** ___ SAT ___ UNSAT
STANDARD:	Operator inserts the keys and places key switches for the following Vent Valves to the OPEN position and observes the red open light illuminated for each: • RC-568, HEAD VENT • RC-570, PZR VENT • RC-572, CV ATMOS • RC-567, HEAD VENT • RC-569, PZR VENT • RC-571, PRT ISO	
EXAMINER'S NOTE:	**Sequence is not dependent for acceptable performance (i.e., insert all keys prior to opening valves, or insert each key and open each valve)**	
COMMENTS:		

STEP 14:	Depressurize At Least One Intact S/G To Atmospheric Pressure Using Steam Line PORVs (Step 38)	**CRITICAL STEP**
STANDARD:	Operator opens at least 1 S/G PORV by adjusting the potentiometer in the clockwise direction	___ SAT
COMMENTS:		___ UNSAT
	END OF TASK	

TIME STOP: ________ **TIME CRITICAL STOP TIME:** _________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Plant was initially at 100% power.

2. Loss of both main feedwater pumps caused reactor and turbine trip

3. Unavailability of AFW pumps has led to a "RED" condition on Heat Sink Critical Safety Function Status Tree

4. You are the Reactor Operator.

INITIATING CUES:

The CRSS has directed you to perform actions IAW FRP-H.1, Response To Loss Of Secondary Heat Sink up to isolating the SI Accumulators

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-097

Place Excess Letdown in Service to the Volume Control Tank

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ____________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Initiate Excess Letdown IAW OP-301
004*017*R1*01

Alternate Path:

N/A

Facility JPM #:

CR-097, Place Excess Letdown in Service to the Volume Control Tank
RO / SRO

K/A Rating(s):

004 A1.07 2.7/3.1
004 A1.08 2.7/2.9
004 A1.11 3.0/3.0
004 A4.05 3.6/3.1

Task Standard:

Excess letdown flow established to the VCT IAW 301-1, Section 8.4.12

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OP-301-1,

Validation Time: 20 min. **Time Critical:** No

Candidate: ____________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______

Performance Time: ________

Examiner: ______________________ __________________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 6
Critical because operator action is required to establish Excess Letdown

Step 7
Critical because deliberate operation is required to open HCV-137 without exceeding 195°F

Step 11
Critical because operator action is required to reduce charging flow to minimum

Step 12
Critical because operator action is required to isolate letdown

Step 13
Critical because operator action is required to isolate letdown

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-219, go to RUN then place in FREEZE.
2. Place simulator in RUN when directed by the examiner.

Tools/Equipment/Procedures Needed:

OP-301-1, Section 8.4.12 with steps 8.4.12.1.a and b filled in

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Plant is at 100% power.
2. All plant controls are in auto/normal.
3. Valves CVC-460A & B have failed shut. Maintenance reports return to service in 1 hour.
4. No other plant equipment is OOS.

INITIATING CUES:

You have been directed by the CRSS to place excess letdown in service to the VCT and remove normal letdown from service IAW approved plant procedures.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-301-1 ***Hand the operator the copy of OP-301-1, Section 8.4.12 after he/she locates it.*** COMMENTS:	_____ SAT ____ UNSAT

CAUTION: Redundant Charging Header Pressure shall be utilized when available, such as RTGB indication (PI-121), ERFIS (CHP0142A), and local indication. (CR 95-01752)

NOTE: This procedure involves systems and activities with negligible potential to reduce margins of safety OR introduce unwanted transients OR plant trips. This is a Case Three evolution and no additional management involvement is required beyond that routinely provided by first line supervision.

STEP 2: IF available, THEN perform the following: (Step 8.4.12.1.c) 1) Place on ERFIS trend Charging Header Pressure (CHP0142A) and RCS Charging Flow (CHF0128A). (CR 95-01752) 2) Update the ERFIS Calorimetric program to reflect Excess Letdown is in service. STANDARD: 1) ERFIS points CHF0142A and CHF0128A are displayed. 2) ERFIS Calorimetric is updated **EXAMINER'S CUE: The STA will update the ERFIS Calorimetric Program** **EXAMINER'S NOTE: The operator may "call up" points individually or use Group Display CVCS** COMMENTS:	_____ SAT ____ UNSAT
STEP 3: Verify open CC-739, CCW FROM EXCESS LTDN HX (Step 8.4.12.1.d) STANDARD: Operator determines CC-739 is open by observing the red open light illuminated COMMENTS:	_____ SAT ____ UNSAT

STEP 4: Verify Component Cooling Water flow is greater than or equal to 240 gpm as indicated by FI-624. (Step 8.4.12.1.e) STANDARD: Operator determines CCW flow to the Excess Letdown Heat Exchanger (FI-624) ≥ 240 gpm by local AO observation **BOOTH INSTRUCTOR'S CUE: When called, respond as the Inside Auxiliary Operator and report FI-624 indicates 250 gpm** COMMENTS:	____ SAT ____ UNSAT

NOTE: Additional excess letdown flow may be obtained by placing CVC-389, EXCESS LTDN DIV, to the RCDT position, however considerations should be given to the additional liquid waste generated. (CR 95-01752)

STEP 5: Position CVC-389, EXCESS LTDN DIV, as required by plant conditions (Step 8.4.12.1.f) STANDARD: Operator positions CVC-389 to the VCT as indicated by the white VCT light illuminated COMMENTS:	____ SAT ____ UNSAT
STEP 6: Open CVC-387, EXCESS LTDN STOP. (Step 8.4.12.1.g) STANDARD: Operator opens CVC-387 by placing the control switch to the open position and observing the red open light illuminated. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

CAUTION: Excess Letdown HX outlet temperature shall NOT exceed 195°F.

STEP 7: Using HIC-137 positioner slowly open HCV-137, EXCESS LTDN FLOW, allowing for warmup of the Excess Letdown Heat Exchanger. (Step 8.4.12.1.h) STANDARD: Operator slowly opens HCV-137 by rotating the potentiometer in the clockwise direction while observing/maintaining TI-139 (Excess Letdown HX Outlet Temperature) < 195°F. **EXAMINER'S NOTE: HIC-137 at ~ 80% demand will raise Excess Letdown HX Outlet temperature to ≤195 °F** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: Verify HIC-121, CHARGING FLOW FULL OPEN (Step 8.4.12.1.i) STANDARD: Operator determines HCV-121 is fully open by observing 0% demand on HIC-121. COMMENTS:	____ SAT ____ UNSAT

NOTE: Pressurizer Level will increase if total charging flow exceeds total letdown flow AND Reactor Coolant Pump seal leakoff flow. (CR 95-01752)
The Pressurizer shall be OPERABLE with:
PZR Water level ≤ 63.3% in MODE 1;
PZR Water level ≤ 92% in MODE 2 and 3 and;
PZR heaters OPERABLE with a capacity of ≥ 125 KW
and capable of being powered from an emergency power supply. (ITS LCO 3.4.9)

STEP 9: Close LCV-460A & B, LTDN LINE STOP (Step 8.4.12.1.j.1) STANDARD: Operator determines LCV-460A & B are closed by observing the green shut light illuminated. COMMENTS:	____ SAT ____ UNSAT

STEP 10: Verify one Charging Pump RUNNING (Step 8.4.12.1.j.2) STANDARD: Operator determines "C" Charging Pump is running by observing the red breaker closed light illuminated. COMMENTS:	____ SAT ____ UNSAT
STEP 11: Place the Charging Pump in MANUAL AND REDUCE speed to minimum. (Step 8.4.12.1.j.3) STANDARD: Operator places "C" Charging Pump in manual by depressing the MAN pushbutton on the controller and depressing the ↓ pushbutton until 0% demand is indicated. **EXAMINER'S NOTE: APP-003-F3, CHG LO SPEED alarm will actuate due to placing the "C" Charging Pump at minimum speed** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 12: Verify CLOSE CVC-200A, B, and C, LTDN ORIFICE (Step 8.4.12.1.j.4, 5, and 6) STANDARD: Operator positions CVC-200A to closed and determines CVC-200A, B, and C are closed by observing their green closed light illuminated. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 13: CLOSE CVC-204A and B, LETDOWN LINE ISOL (Step 8.4.12.1.j.7 and 8) STANDARD: Operator positions CVC-204A and B to the closed position and observes the green closed light illuminated. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 14: Record the following charging line and RCP seal injection flows. (Step 8.4.12.1.j.9) – FT-122 RCS CHARGING FLOW from ERFIS CHF0128A ____ gpm – FI-124 ______ gpm – FI-127 ______ gpm – FI-130 ______ gpm STANDARD: Operator records flow from ERFIS point CHF0128A and directs Inside Auxiliary Operator to report RCP Seal Injection flows on FI-124, 127, and 130. **BOOTH INSTRUCTOR'S CUE: When asked, respond as the Inside Auxiliary Operator that all RCP Seal Injection flows = 6 gpm.** **EXAMINER'S NOTE: CHF0128A = 0 gpm FT-124, 127, 130 = 6 gpm** COMMENTS:	____ SAT ____ UNSAT
STEP 15: Add the flows recorded in Step 8.4.12.1.j.9 above for the TOTAL Charging Pump flow. TOTAL Charging Pump Flow ____ gpm. (Step 8.4.12.1.j.10) STANDARD: Operator determines total charging flow is ~ 18 gpm. COMMENTS:	____ SAT ____ UNSAT

NOTE: It is NOT necessary to readjust RCP Seal Injection Flows to the normal range of 8 to 13 gpm for evolutions which will only last for several hours, provided the seal injection flow is maintained within 6 to 20 gpm for RCP Continuous operation. Seal injection flow shall be ≥ 6 gpm to each RCP when in MODES 1,2,3 and 4. (ITS 3.4.17)

CAUTION: IF care is NOT exercised WHEN throttling closed on HIC-121 OR CVC-297A, B, or C, the Charging Pump discharge pressure may increase AND result in lifting the Charging Pump discharge relief valve(s) which may not reseat. (CR 95-01752)
Maintaining a flowpath greater than charging pump(s) capacity will prevent the discharge relief valves(s) from being challenged. (CR 95-01752)

STEP 16: IF Charging flow is changed, THEN while maintaining Charging Pump discharge pressure less than 2500 psig, throttle the following valves, as necessary, to establish Seal Injection flow to an acceptable range: (CR 95-01752, ESR 95-00919) (Step 8.4.12.1.k) – CVC-297A – CVC-297B – CVC-297C STANDARD: Operator determines seal injection flows to all RCPs are satisfactory at 6 gpm, charging flow change not required. **EXAMINER'S NOTE: The operator may dispatch the IAO to adjust seal injection flows** **BOOTH INSTRUCTOR'S CUE: If asked, adjust seal injection flows (From Simulation Diagram, CVCS p.1b: select CVC297A,B,C Remote Function, increase to 60% for 8 gpm flow)** COMMENTS:	____ SAT ____ UNSAT
STEP 17: IF seal injection flow cannot be increased to an acceptable range, THEN, while MAINTAINING Charging Pump discharge PRESSURE LESS THAN 2500 psig AND TOTAL CHARGING PUMP FLOW GREATER THAN OR EQUAL to the value recorded in step 8.4.12.1.j.10, perform the following: (Step 8.4.12.1.l) 1) Throttle close HIC-121 to obtain acceptable seal injection flows. 2) Throttle the following valves, as necessary, to establish Seal Injection flow to an acceptable range; – CVC-297A – CVC-297B – CVC-297C STANDARD: Operator determines seal injection flows are within acceptable range. COMMENTS:	____ SAT ____ UNSAT

NOTE: The Pressurizer shall be OPERABLE with:
PZR Water level ≤ 63.3% in MODE 1;
PZR Water level ≤ 92% in MODE 2 and 3 and;
PZR heaters OPERABLE with a capacity of ≥ 125 KW
and capable of being powered from an emergency power supply. (ITS LCO 3.4.9)

STEP 18: IF Pressurizer level continues increasing, THEN Contact Chemistry to perform the alignment for purging the Pressurizer Liquid sample line with full flow to the VCT IAW CP-003. (CR 95-01752) (Step 8.4.12.1.m) STANDARD: Operator determines PZR level is not increasing. (Operator may determine to have Chemistry place the Pressurizer Liquid sample line in service) COMMENTS:	_____ SAT _____ UNSAT
STEP 19: IF Pressurizer level continues to increase, THEN evaluate the time excess letdown will be required against the rate of Pressurizer level increase and length of time available to remain with excess letdown in service. (CR 95-01752) (Step 8.4.12.1.n) STANDARD: Operator determines PZR level is not increasing. COMMENTS: **END OF TASK**	_____ SAT _____ UNSAT

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Plant is at 100% power.
2. All plant controls are in auto/normal.
3. Valves CVC-460A & B have failed shut. Maintenance reports return to service in 1 hour.
4. No other plant equipment is OOS.

INITIATING CUES:

You have been directed by the CRSS to place excess letdown in service to the VCT and remove normal letdown from service IAW approved plant procedures.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-106

Manual QPTR Calculation

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ____________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Calculate Quadrant Power Tilt Ratio IAW FMP-007 (015*004*R2*01)

Alternate Path:

N/A

Facility JPM #:

JPM CR-106
RO / SRO

K/A Rating(s):

015 A1.04 (3.5/3.7)

Task Standard:

Perform a manual QPTR calculation IAW FMP-007, Quadrant Power Tilt with an accuracy as stated on attached form.

Preferred Evaluation Location: | **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ | Perform __X__ Simulate ______

References:

FMP-007, Quadrant Power Tilt

Validation Time: 15 min. **Time Critical:** No

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ________________________ ____________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 2
Critical because the operator must accurately read the nuclear instruments

Step 7
Critical because the operator must determine the maximum Upper Normalized Detector Ratio

Step 8
Critical because the operator must determine the maximum Lower Normalized Detector Ratio

Step 9
Critical because the operator must determine the maximum QPTR

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-214, go to RUN and allow conditions to stabilize
2. Place simulator in FREEZE
3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-23 Chemistry Sheet

Tools/Equipment/Procedures Needed:

FMP-007
Calculator

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The unit is at ~51%, 325 MWe

Nuclear Instrument PRNI-41 is inoperable due to a failed high voltage power supply.
All actions for the inoperable PRNI have been taken.

In addition to the alarms caused by the inoperable NI, the following alarm(s) are illuminated:

- APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT

INITIATING CUES:

The CRSS has directed you to determine the Quadrant Power Tilt for the current plant conditions.

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of FMP-007, Quadrant Power Tilt. ***Hand the candidate the copy of the procedure after he/she locates it.*** COMMENTS:	_____ SAT _____ UNSAT
STEP 2: Read the Upper (A) and the Lower (B) Indicated Detector Currents from the Detector Current meters of each operable Power Range channel and record on ATTACHMENT 10.2 (Step 8.2.4.1) STANDARD: Upper and Lower Detector Currents recorded for PRNI-42,43, & 44 **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	**CRITICAL STEP** _____ SAT _____ UNSAT
STEP 3: Record the Upper and Lower Detector Normalizing Detector Currents from the Control Room Status Board for each operable Power Range channel on ATTACHMENT 10.2. (Step 8.2.4.2) STANDARD: Upper and Lower Detector Normalizing Detector Currents recorded from the Control Room Status Board on ATTACHMENT 10.2: **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	_____ SAT _____ UNSAT

NOTE: Normalized Ratios, Average Ratios and QPTR values should be recorded to at least 3 decimal places.

STEP 4: Divide each Indicated Detector Current by its corresponding Normalizing Detector Current and record the result on ATTACHMENT 10.2. (Step 8.2.4.3) STANDARD: Indicated Detector Currents divided by their corresponding Normalizing Detector Currents and recorded on ATTACHMENT 10.2. **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT
STEP 5: Average the Upper Normalized Detector Ratios and record the result as the Average Normalized Detector Ratio in the Upper column on ATTACHMENT 10.2. (Step 8.2.4.4) STANDARD: Upper Normalized Detector Ratios averaged and recorded on ATTACHMENT 10.2. Average Upper Normalized Detector Ratio: **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT
STEP 6: Average the Lower Normalized Detector Ratios and record the result as the Average Normalized Detector Ratio in the Lower column on ATTACHMENT 10.2 (Step 8.2.4.5) STANDARD: Lower Normalized Detector Ratios averaged and recorded on ATTACHMENT 10.2. Average Lower Normalized Detector Ratio **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	____ SAT ____ UNSAT

STEP 7: Determine the maximum Upper Normalized Detector Ratio and divide it by the Average Upper Normalized Detector Ratio and record the resulting Upper QPTR on ATTACHMENT 10.2. (Step 8.2.4.6) STANDARD: PRNI-41 (maximum Upper Normalized Detector Ratio) divided by the Average Upper Normalized Detector Ratio and recorded on ATTACHMENT 10.2. **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: Determine the maximum Lower Normalized Detector Ratio and divide it by the Average Lower Normalized Detector Ratio and record the resulting Lower QPTR on ATTACHMENT 10.2 (Step 8.2.4.7) STANDARD: PRNI-44 (maximum Lower Normalized Detector Ratio) divided by the Average Lower Normalized Detector Ratio and recorded on ATTACHMENT 10.2. **EXAMINER'S NOTE: See completed Attachment 10.2 (Attached)** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 9: Record the larger of the Upper QPTR or the Lower QPTR as the Maximum QPTR on ATTACHMENT 10.2 along with the reactor power and any comments. (Step 8.2.4.8) STANDARD: QPTR recorded as the maximum QPTR, Power Level recorded as 51%. COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

ATTACHMENT 10.2

MANUAL QPTR CALCULATIONS

This revision is the latest revision available and has been verified against NRCS.

Name (Print)	Initial	Signature	Date

Channel	Indicated Detector Currents		Normalizing Detector Currents		Normalized Detector Ratio	
	Upper	Lower	Upper	Lower	Upper	Lower
N41	OOS	OOS	OOS	OOS	OOS	OOS.
N42	*75* **78** 80	*73* **75** 77	**250.5**	**249**	*.2994* **.3114** *.3194*	*.2934* **.3012** *.3092*
N43	*74* **76** *77*	*72* **73** *75*	**250.5**	**249**	*.2954* **.3034** *.3074*	*.2892* **.2932** *.3012*
N44	*75* **77** *79*	*73* **74** *75*	**250.5**	**249**	*.2994* **.3074** *.3154*	*.2905* **.2972** *.3012*
Average Normalized Detector Ratio =					*.2981* **.3074** *.3141*	*.2910* **.2972** *.3039*

Upper QPTR = **.3114** *.2994* *.3194* (Max Normalized Ratio) / **.3074** *.2981* *.3141* (Avg Normalized Ratio) = **1.013** *1.004* *1.017*

Lower QPTR = **.3012** *.2934* *.3092* (Max Normalized Ratio) / **.2972** *.2910* *.3039* (Avg Normalized Ratio) = **1.013** *1.008* *1.017*

Maximum QPTR = **1.013** *1.008* *1.017* Power Level = **51%**

Performed By: ______________________ Date: __________ Time: __________

Comments: ____

SSO Review: ______________________ Date: __________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The unit is at ~51%, 325 MWE

Nuclear Instrument PRNI-41 is inoperable due to a failed high voltage power supply.
All actions for the inoperable NI have been taken

In addition to the alarms caused by the inoperable NI, the following alarm(s) are illuminated:

- APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT

INITIATING CUES:

The CRSS has directed you to determine the Quadrant Power Tilt for the current plant conditions .

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-107

Restore PRT to Normal Operating Conditions

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Add water to the PRT IAW OP-103	007*002*R1*01
Drain water from the PRT when Pressurizer temperature is greater than 200 °F IAW OP-103	007*004*R1*01
Vent the PRT IAW OP-103	007*006*R1*01

Alternate Path:

N/A

Facility JPM #:

CR-107
RO / SRO

K/A Rating(s):

007 A1.01 (2.9/3.1)   007 A1.02 (2.7/2.9)
007 A1.03 (2.6/2.7)   007 A2.02 (2.6/3.2)

Task Standard:

ESTABLISH NORMAL OPERATING CONDITIONS IN THE PRT IAW OP-103

Preferred Evaluation Location:

Simulator __X__ In-Plant ______

Preferred Evaluation Method:

Perform __X__ Simulate ______

References:

OP-103

Validation Time: 15 min.   **Time Critical:** NO

Candidate: ______________________
NAME

Overall Time
Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______

Performance Time: ________

Examiner: ______________________ ______________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 4

Critical because operator action is required to establish the PRT drain path.

Step 6

Critical because operator must recognize PRT temperature is > 120°Fto transition to proper section of the procedure.

Step 8

Critical because a Primary Water Pump must be started to cool the water in the PRT.

Step 9

Critical because RC-519A&B are the Containment Isolation valves which must be open to allow Primary Water into the Containment.

Step 10

Critical because RC-519C must be opened to provide a flowpath for Primary Water to the PRT.

Step 11

Critical because RC-519A&B and C must be closed to isolate Primary Water to the Containment.

Step 15

Critical because RC-549 is required to be opened to vent the PRT to the Vent Header.

Step 17

Critical because RC-549 must be closed to isolate the PRT from the Vent Header.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-212

2. If IC-212 is not functioning, perform the following:
   - Initialize simulator to IC-5 and go to RUN.
   - Fill the PRT with Primary Water to 82%.
   - Insert malfunction **PRS03C** at 10% (PZR PORV PCV-456 failed open)
   - Close PORV Block Valve RC-535 when the following conditions are reached in the PRT
     TI- 471 (PRT temperature) 128°F
   - Allow plant conditions to stabilize

3. Place the simulator in FREEZE.

4. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-103, Pressurizer Relief Tank Control System.

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The unit was at 100% when PZR PORV PCV-456 failed open.

The crew responded IAW the appropriate plant procedures. Plant conditions are now stable.

INITIATING CUES:

The CRSS has directed you to restore PRT parameters to normal operating conditions IAW OP-103.

START TIME: ______

EXAMINER NOTE: The operator will probably address the PRT parameters in the same sequence as the procedure, although successful performance is not sequence dependent.

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-103. **Hand the candidate the copy of the procedure after he/she locates it.** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 2: 1. All prerequisites of Section 3.0 are complete.. (Step 6.1.1.1-3) 2. The Pressurizer temperature is ≥ 200°F AND PRT level is above 70%. 3. Primary water addition to the PRT is NOT in progress. STANDARD: Prerequisites verified complete. PZR verified > 200°F on TI-453/454. PRT level verified > 70% on LI-470. RC-519A&B, PW TO CV ISO and/or RC-519C, PW TO PRT ISO verified closed. **EXAMINER'S CUE: If asked, all systems are aligned for operation.** **Nitrogen — Instrument & Station Air** **Primary Water — Liquid Waste Disposal** **Waste Gas — Gas Analyzer** **BOOTH INSTRUCTOR'S CUE: If asked as the Chemistry Technician, the last sample indicated 0% hydrogen in the PRT.** COMMENTS:	____ SAT ____ UNSAT

NOTE: The following step is a continuous action step and should be performed when conditions are met.

STEP 3: IF the PRT temperature is ≥ 160°F, THEN Go To 6.1.2.5. (Step 6.1.2.1) STANDARD: PRT temperature is checked < 160°F on TI-471. COMMENTS:	____ SAT ____ UNSAT

NOTE: Placing RC-523, PRT DRAIN, control switch in OPEN also opens LCV-1003B, RCDT PUMP "B" SUCTION, and starts REACTOR COOLANT DRAIN TANK PUMP "B" if the control switches are in AUTO.

STEP 4: IF the normal drain path via the RCDT is available, AND a Containment Phase A Isolation signal is not present, THEN perform the following: (Step 6.1.2.2.a & b) a. Open RC-523, PRT DRAIN b. WHEN PRT level returns to between 70% and 74%, THEN close RC-523. STANDARD: RC-523 cycled to obtain PRT level between 70% and 74% indicated on LI-470. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** **"B" RCDT Pump in AUTO** **LCV-1003B, RCDT PUMP "B" SUCTION is in AUTO** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 5: IF the normal drain path via the RCDT is not available, OR a Containment Phase A Isolation signal is present, THEN perform the following: (Step 6.1.2.3.a-d) a. Open WD-1708, RCDT DRAIN TO CV SUMP b. Verify REACTOR COOLANT DRAIN TANK PUMP "B" control switch in STOP. c. Open RC-523, PRT DRAIN. d. WHEN PRT level returns to between 70% and 74%, THEN perform the following: 1) Close RC-523 2) Close WD-1708 3) Place REACTOR COOLANT DRAIN TANK PUMP "B" control switch in the proper position for plant conditions. STANDARD: Normal drain path via RCDT is available, this step N/A. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** COMMENTS:	____ SAT ____ UNSAT

STEP 6:	IF PRT temperature is >120°F, THEN add Primary Water to the PRT IAW Section 6.2. (Step 6.1.4)	**CRITICAL STEP**
STANDARD:	PRT temperature indicates >120°F on TI-471, candidate recognizes need to cool the PRT IAW Section 6.2.	____ SAT
COMMENTS:		____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 7:	1. All the Prerequisites of Section 3 are complete. (Step 6.2.1.1-3) 2. PRT level is < 80%. 3. Draining the PRT is NOT in progress. (SER 93-007)	
STANDARD:	Prerequisites verified complete. PRT verified <80% on LI-470 RC-523 verified closed using green light above RTGB control switch.	____ SAT
COMMENTS:		____ UNSAT

CAUTION: Operating 2 Primary Water Pumps has the capacity to fill the PRT faster than it can vent. If the RCS is depressurized and vented through a PORV when 2 Primary Water Pumps are operating, it is possible to inadvertently makeup to the RCS via the PRT spargers. If the expected PRT level increase does not occur, filling the PRT should be stopped and the problem investigated.

STEP 8:	Verify a Primary Water Pump is OPERATING. (Step 6.2.2.1)	**CRITICAL STEP**
STANDARD:	"A" or "B" Primary Water Pump operating as indicated by the red light above the RTGB control switch.	____ SAT
COMMENTS:		____ UNSAT

STEP 9: Open RC-519A&B, PW TO CV ISO. (Step 6.2.2.2) STANDARD: RC-519A&B open indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 10: Open RC-519C, PW TO PRT ISO. (Step 6.2.2.3) STANDARD: RC-519C open indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Increasing PRT level will cause PRT pressure to increase, possibly to the high pressure alarm setpoint of 5 psig.

STEP 11: WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 6.2.2.4.a.,b) a. Close RC-519A&B. b. Close RC-519C. STANDARD: RC-519A&B closed indicated by the green light above the RTGB control switch. RC-519C closed indicated by the green light above the RTGB control switch. **EXAMINER NOTE: Candidate may vent the PRT during the 10 minute wait period.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 12: IF no longer required to support plant conditions, THEN stop the Primary Water Pump. (Step 6.2.2.5) STANDARD: Candidate observes PRT temperature <120°F on TI-471 and determines the Primary Water Pump is no longer required. Primary Water Pump indicates stopped by the green light above the RTGB control switch. COMMENTS:	____ SAT ____ UNSAT
STEP 13: IF PRT level is ≥ 83% OR PRT temperature is > 120°F, THEN lower PRT level IAW Section 6.1. (Step 6.2.2.6) STANDARD: PRT level < 83% PRT temperature < 120°F. **EXAMINER NOTE: If the PRT was overfilled in previous step, re-perform JPM steps 2 thru 6, otherwise operator should perform section 6.3 to vent the PRT** COMMENTS:	____ SAT ____ UNSAT
STEP 14: 1. All the Prerequisites of Section 3.0 are complete. (Step 6.3.1.1,2) 2. PRT Pressure is above 3 psig. STANDARD: Prerequisites previously verified complete. PRT pressure indicates > 3 psig on PI-472. COMMENTS:	____ SAT ____ UNSAT

NOTE: High Pressure alarm actuates at 5 psig and the rupture disc ruptures at 100 psig.

STEP 15: Open RC-549, PRT VENT. (Step 6.3.2.1) STANDARD: RC-549 open indicated open by the red light above the RTGB control switch. **EXMAINER NOTE: JPM steps 15, 16 and 17 may be performed IAW the annunciator response procedure APP-003-C3. The actions in OP-103 and APP-003-C3 are identical.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 16: IF required to maintain proper Vent Header pressure, THEN verify a Waste Gas Compressor starts. (Step 6.3.2.2) STANDARD: Operator may direct the Inside Auxiliary Operator to verify a Waste Gas Compressor starts. **BOOTH INSTRUCTOR'S CUE: If asked, report "A" Waste Gas Compressor is running.** COMMENTS:	____ SAT ____ UNSAT
STEP 17: WHEN PRT pressure is < 3 psig, THEN close RC-549. (Step 6.3.2.3) STANDARD: RC-549 closed indicated by green light above the RTGB control switch. COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The unit was at 100% when PZR PORV PCV-456 failed open.

The crew responded IAW the appropriate plant procedures. Plant conditions are now stable.

INITIATING CUES:

The CRSS has directed you to restore PRT parameters to normal operating conditions IAW OP-103.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-108

Restore PRT to Normal Operating Conditions

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: __________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Add water to the PRT IAW OP-103	007*002*R1*01
Drain water from the PRT when Pressurizer temperature is greater than 200 °F IAW OP-103	007*004*R1*01
Vent the PRT IAW OP-103	007*006*R1*01

Alternate Path:

PRT temperature ≥ 160°F

Facility JPM #:

JPM CR-108
RO / SRO

K/A Rating(s):

007 A1.01 (2.9/3.1) 007 A1.02 (2.7/2.9)
007 A1.03 (2.6/2.7) 007 A2.02 (2.6/3.2)

Task Standard:

ESTABLISH NORMAL OPERATING CONDITIONS IN THE PRT IAW OP-103

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ Perform __X__ Simulate ______

References:

OP-103

Validation Time: 26 min. **Time Critical: NO**

Candidate: ________________________
NAME

Overall Time
Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ________________________ ____________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 3
Critical because operator must recognize PRT temperature is > 160°F to make proper procedural transition.

Step 4
Critical because operator must align a flowpath from the PRT to the CV Sump to drain the PRT.

Step 5
Critical because operator must align a flowpath from the PRT to the CV Sump to drain the PRT.

Step 6
Critical because operator must align a flowpath from the PRT to the CV Sump to drain the PRT.

Step 7
Critical because operator must open drain to lower PRT level.

Step 8
Critical because PRT drain valve must be closed to maintain adequate PRT level

Step 9
Critical to restore RCDT Pumps to normal configuration.

Step 13
Critical because a Primary Water Pump must be started to cool the water in the PRT

Step 14
Critical because RC-519A & B are the Containment Isolation valves which must be open to allow Primary Water into Containment

Step 15
Critical because RC-519C must be open to provide a flowpath for Primary Water to the PRT

Step 16
Critical because RC-519A,B, & C must be closed to isolate Primary Water to the Containment

Step 24
Critical because RC-549 is required to be opened to vent the PRT to the Vent Header

Step 26
Critical because RC-549 must be closed to isolate the PRT from the Vent Header

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC-213 and activate CAEP 88_JPM_CR_108_R0

2. If IC-213 and/or CAEP is not functioning, perform the following:
   - Initialize simulator to IC-5 and go to RUN.
   - Fill the PRT with Primary Water to 82%.
   - Insert malfunction **PRS03C** at 10% (PZR PORV PCV-456 failed open)
   - Close PORV Block Valve RC-535 when the following conditions are reached in the PRT
     TI- 471 (PRT temperature) 164°F
   - Allow plant conditions to stabilize

3. Place the simulator in FREEZE

4. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

The CAEP has the following triggers included:

- E9 (88_JPM_CR_108): When RC-523 control switch is placed in the open position,
  PRT level (LT-470) will decrease to a minimum of 68% over a 4 minute ramp
  PRT temperature (TT-471) will decrease to 125°F over a 5 minute ramp

- E10 (88_JPM_CR_108_1): When RC-519C control switch is placed in the open position,
  PRT temperature (TT-471) will decrease to 118°F over a 3 minute ramp
  PRT level (LT-470) will increase to a maximum of 82% over a 4 minute ramp

- E5 (88_JPM_CR_108_2): After RC-523 control switch has been opened then closed,
  PRT temperature and level (TT-471 and LT-470) are overridden as is

- E6 (88_JPM_CR_108_3): After RC-519C has been opened then closed,
  PRT temperature (TT-471) is overridden to 118°F
  PRT level (LT-470) is overridden as is

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

OP-103, Pressurizer Relief Tank Control System
Caution Tag Index & Caution Tag Sheet

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The unit was at 100% when PZR PORV PCV-456 failed open approximately 30 minutes ago.

The crew responded IAW the appropriate plant procedures. Plant conditions are now stable.

INITIATING CUES:

The CRSS has directed you to restore PRT parameters to normal operating conditions IAW OP-103

EXAMINER CUE:

For the purposes of this JPM, PRT parameters will respond quicker than normal[1].

[1] NUREG 1021 (Final Rev. 8) Appendix E, Part E, Simulator Test Guidelines No. 9

START TIME: _______

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of OP-103. *Hand the operator the copy of the procedure after he/she locates it.* COMMENTS:	_____ SAT _____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 2: 1. All prerequisites of Section 3.0 are complete. (Step 6.1.1.1-3) 2. The Pressurizer temperature is ≥ 200°F AND PRT level is above 70%. 3. Primary water addition to the PRT is NOT in progress. STANDARD: Prerequisites verified complete. PZR verified > 200°F on TI-453/454. PRT level verified > 70% on LI-470. RC-519A&B, PW TO CV ISO and/or RC-519C, PW TO PRT ISO verified closed. **EXAMINER'S CUE: If asked, all systems are aligned for operation.** **Nitrogen — Instrument & Station Air** **Primary Water — Liquid Waste Disposal** **Waste Gas — Gas Analyzer** **BOOTH INSTRUCTOR'S CUE: If asked as the Chemistry Technician, the last sample indicated 0% hydrogen in the PRT.** COMMENTS:	_____ SAT _____ UNSAT

NOTE: The following step is a continuous action step and should be performed when conditions are met.

STEP 3:	IF the PRT temperature is ≥ 160°F, THEN Go To 6.1.2.5. (Step 6.1.2.1)	**CRITICAL STEP**
STANDARD:	Operator determines PRT temperature >160°F by observing TI-471 and proceeds to step 6.1.2.5	____ SAT
COMMENTS:		____ UNSAT

CAUTION: If the PRT temperature exceeds 160°F its content should be drained to the sump. Water from the sump shall not be pumped through Containment Isolation valves until the integrity of the PRT Liner and/or the acceptable leakage rates of the valves has been verified. (ESR 96-00608)

STEP 4:	Verify CV Sump equipment aligned as follows: (Step 6.1.2.5.a) 1. CV Sump Pump breakers OPEN • CV SUMP PUMP "A" on MCC 2 in CMPT 3M • CV SUMP PUMP "B" on MCC 1 in CMPT 5H 2. CV Sump Pump Discharge valves CLOSED • WD-1728, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION • WD-1723, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION	**CRITICAL STEP** ____ SAT ____ UNSAT
STANDARD:	Operator directs the Inside Auxiliary Operator to verify: • CV SUMP PUMP "A" on MCC 2 in CMPT 3M breaker is open • CV SUMP PUMP "B" on MCC 1 in CMPT 5H breaker is open • WD-1728, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION is closed • WD-1723, CONTAINMENT SUMP PUMP DISCHARGE AUTO ISOLATION is closed	
BOOTH INSTRUCTOR'S CUE:	**When directed, open breakers MCC-2 / 3M (OAO) and MCC-1 / 5H (IAO) and close valves WD-1728 and 1723 and report to the Control Room** **RFP EPS 354 RACKOUT** **RFP EPS 355 RACKOUT** **RFI WDS 002 CLOSE** **RFI WDS 003 CLOSE**	
COMMENTS:		

STEP 5: Open WD-1708, RCDT DRAIN TO CV SUMP (Step 6.1.2.5.b) STANDARD: Inside Auxiliary Operator directed to open WD-1708. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator by opening WD-1708 and report its position** **RFP MSC 029 max** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 6: Place REACTOR COOLANT DRAIN TANK PUMPS "A" & "B" control switches in STOP. (Step 6.1.2.5.c) STANDARD: Inside Auxiliary Operator directed to place the Reactor Coolant Drain Tank Pumps "A" & "B" control switches in STOP. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator by placing the control switches for the Reactor Coolant Drain Pumps "A" & "B" in the Stop position and reporting their position** **RFP MSC 007** **RFP MSC 008** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 7: Open RC-523, PRT DRAIN. (Step 6.1.2.5.d) STANDARD: RC-523 indicated open by the red light above RTGB control switch. **BOOTH INSTRUCTOR'S NOTE: Trigger E9 initiated when RC-523 is placed in the open position** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

<u>STEP 8</u>: <u>WHEN</u> PRT level returns to between 70% and 74%, <u>THEN</u> perform the following: (Step 6.1.2.5.e) 1. Close RC-523. 2. Close WD-1708 <u>STANDARD</u>: When PRT level indicates between 70% and 74% on LI-470: 1. RC-523 is closed as indicated by the green light above the RTGB control switch. 2. Inside Auxiliary Operator is directed to close WD-1708. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator by closing WD-1708 and reporting its position** **RFP MSC 029 min** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 9</u>: Place REACTOR COOLANT DRAIN TANK PUMPS "A" & "B" control switches in AUTO. (Step 6.1.2.5.f) <u>STANDARD</u>: Inside Auxiliary Operator directed to place the Reactor Coolant Drain Tank Pumps "A" & "B" control switches in AUTO. **BOOTH INSTRUCTOR'S CUE: When directed, respond as the Inside Auxiliary Operator that the Reactor Coolant Drain Tank Pumps "A" & "B" control switches have been returned to AUTO** **RFP MSC 007** **RFP MSC 008** <u>COMMENTS</u>:	**<u>CRITICAL STEP</u>** ____ SAT ____ UNSAT
<u>STEP 10</u>: Place caution tag on RC-523 switch that reads "If the PRT requires draining it shall be aligned to the CV sump only", This caution to remain in effect until the PRT internal coating evaluation is complete. (Step 6.1.2.5.g) <u>STANDARD</u>: Caution tag (yellow cap) placed on RC-523 control switch. **BOOTH INSTRUCTOR'S CUE: If requested/directed as the Work Control Center SRO, respond that a caution tag clearance has been initiated.** **EXAMINER'S CUE: Once the operator determines a caution tag is required, hand the operator the Caution Tag Sheet and Yellow Cap** <u>COMMENTS</u>:	____ SAT ____ UNSAT

STEP 11: Consult RESS for PRT internal coating evaluation. (Step 6.1.2.5.h) STANDARD: RESS consulted to perform an internal coating evaluation for the PRT. **BOOTH INSTRUCTOR'S CUE: If consulted, respond as a RESS system engineer that an internal coating evaluation for the PRT has been performed. PRT Liner integrity determined to be acceptable as long as PRT internal temperature has not exceeded 160°F for more than 3 hours.** **EXAMINER'S CUE: If requested, respond as the CRSS / STA / SSO that RESS will be contacted to perform an internal coating evaluation of the PRT. Then, respond as a RESS system engineer that an internal coating evaluation for the PRT has been performed. PRT Liner integrity determined to be acceptable as long as PRT internal temperature has not exceeded 160°F for more than 3 hours.** **EXAMINER'S NOTE: The Caution Tag can be removed due to the evaluation being complete** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

STEP 12: 1. All the Prerequisites of Section 3 are complete. (Step 6.2.1.1-3) 2. PRT level is < 80%. 3. Draining the PRT is NOT in progress. (SER 93-007) STANDARD: Prerequisites verified complete. PRT verified <80% on LI-470 RC-523 verified closed using green light above RTGB control switch. COMMENTS:	____ SAT ____ UNSAT

CAUTION: Operating 2 Primary Water Pumps has the capacity to fill the PRT faster than it can vent. If the RCS is depressurized and vented through a PORV when 2 Primary Water Pumps are operating, it is possible to inadvertently makeup to the RCS via the PRT spargers. If the expected PRT level increase does not occur, filling the PRT should be stopped and the problem investigated.

STEP 13: Verify a Primary Water Pump is OPERATING. (Step 6.2.2.1) STANDARD: "A" or "B" Primary Water Pump operating as indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 14: Open RC-519A & B, PW TO CV ISO. (Step 6.2.2.2) STANDARD: RC-519A&B open indicated by the red light above the RTGB control switch. COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 15: Open RC-519C, PW TO PRT ISO. (Step 6.2.2.3) STANDARD: RC-519C open indicated by the red light above the RTGB control switch. **BOOTH INSTRUCTOR'S NOTE: Trigger E10 initiated when RC-519C is placed in the open position** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

NOTE: Increasing PRT level will cause PRT pressure to increase, possibly to the high pressure alarm setpoint of 5 psig.

EXAMINER'S CUE: If operator announces PRT High Pressure out loud, acknowledge as the CRSS

STEP 16: WHEN PRT level is between 70% and 80%, THEN perform the following: (Step 6.2.2.4.a.,b) a. Close RC-519A&B. b. Close RC-519C. STANDARD: RC-519A&B closed indicated by the green light above the RTGB control switch. RC-519C closed indicated by the green light above the RTGB control switch. **EXAMINER'S NOTE: Operator may vent the PRT during the 10 minute wait period. If not, inform him / her the 10 minutes has elapsed.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 17: IF no longer required to support plant conditions, THEN stop the Primary Water Pump. (Step 6.2.2.5) STANDARD: Operator observes PRT temperature <120°F on TI-471 and determines the Primary Water Pump is no longer required. Primary Water Pump is stopped by placing the control switch to the stop position and observing the green light. COMMENTS:	____ SAT ____ UNSAT
STEP 18: IF PRT level is $\geq$ 83% OR PRT temperature is > 120°F, THEN lower PRT level IAW Section 6.1 (Step 6.2.2.6) STANDARD: PRT level < 83% on LI-470. PRT temperature < 120°F on TI-471. Operator determines PRT level and temperature are acceptable **EXAMINER'S NOTE: If the PRT was overfilled in previous step, perform JPM steps 19 - 23. Otherwise, go to step 24 to vent the PRT.** COMMENTS:	____ SAT ____ UNSAT

NOTE: PRT temperatures of > 120°F should be reduced by alternately adding Primary Water to the PRT and draining the PRT. (SER 93-007)
Maximum cooling effect can be achieved by leaving the added Primary Water in the PRT for at least 10 minutes prior to draining. (SER 93-007)

<u>STEP 19</u>: 1. All prerequisites of Section 3.0 are complete.. (Step 6.1.1.1-3) 2. The Pressurizer temperature is ≥ 200°F <u>AND</u> PRT level is above 70%. 3. Primary water addition to the PRT is <u>NOT</u> in progress. <u>STANDARD</u>: Prerequisites verified complete. PZR verified > 200°F on TI-453/454. PRT level verified > 70% on LI-470. RC-519A&B, PW TO CV ISO and/or RC-519C, PW TO PRT ISO verified closed. **EXAMINER'S CUE: If asked, all systems are aligned for operation.** **Nitrogen — Instrument & Station Air** **Primary Water — Liquid Waste Disposal** **Waste Gas — Gas Analyzer** **BOOTH INSTRUCTOR'S CUE: If asked as the Chemistry Technician, the last sample indicated 0% hydrogen in the PRT.** <u>COMMENTS</u>:	____ SAT ____ UNSAT

NOTE: The following step is a continuous action step and should be performed when conditions are met.

<u>STEP 20</u>: <u>IF</u> the PRT temperature is ≥ 160°F, <u>THEN</u> Go To 6.1.2.5. (Step 6.1.2.1) <u>STANDARD</u>: PRT temperature is checked < 160°F on TI-471. <u>COMMENTS</u>:	____ SAT ____ UNSAT

NOTE: Placing RC-523, PRT DRAIN, control switch in OPEN also opens LCV-1003B, RCDT PUMP "B" SUCTION, and starts REACTOR COOLANT DRAIN TANK PUMP "B" if the control switches are in AUTO.

STEP 21: IF the normal drain path via the RCDT is available, AND a Containment Phase A Isolation signal is not present, THEN perform the following: (Step 6.1.2.2.a & b) a. Open RC-523, PRT DRAIN b. WHEN PRT level returns to between 70% and 74%, THEN close RC-523. STANDARD: RC-523 cycled to obtain PRT level between 70% and 74% indicated on LI-470. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** **"B" RCDT Pump in AUTO** **LCV-1003B, RCDT PUMP "B" SUCTION is in AUTO** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 22: IF the normal drain path via the RCDT is not available, OR a Containment Phase A Isolation signal is present, THEN perform the following: (Step 6.1.2.3.a-d) a. Open WD-1708, RCDT DRAIN TO CV SUMP b. Verify REACTOR COOLANT DRAIN TANK PUMP "B" control switch in STOP. c. Open RC-523, PRT DRAIN. d. WHEN PRT level returns to between 70% and 74%, THEN perform the following: 1) Close RC-523 2) Close WD-1708 3) Place REACTOR COOLANT DRAIN TANK PUMP "B" control switch in the proper position for plant conditions. STANDARD: Normal drain path via RCDT is available, this step N/A. **BOOTH INSTRUCTOR'S CUE: If asked/directed, respond as the Inside Auxiliary Operator that the normal drain path is available.** COMMENTS:	____ SAT ____ UNSAT
STEP 23: IF PRT temperature is >120°F, THEN add Primary Water to the PRT IAW Section 6.2. (Step 6.1.4) STANDARD: PRT temperature indicates <120°F on TI-471, operator determines PRT does not require any further cooling.. COMMENTS:	____ SAT ____ UNSAT

NOTE: High Pressure alarm actuates at 5 psig and the rupture disc ruptures at 100 psig.

STEP 24: Open RC-549, PRT VENT. (Step 6.3.2.1) STANDARD: RC-549 open indicated open by the red light above the RTGB control switch. **EXMAINER NOTE: JPM steps 24, 25 and 26 may be performed IAW the annunciator response procedure APP-003-C3. The actions in OP-103 and APP-003-C3 are identical** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 25: IF required to maintain proper Vent Header pressure, THEN verify a Waste Gas Compressor starts. (Step 6.3.2.2) STANDARD: Operator may direct the Inside Auxiliary Operator to verify a Waste Gas Compressor starts. **BOOTH INSTRUCTOR'S CUE: If asked, report "A" Waste Gas Compressor is running.** COMMENTS:	____ SAT ____ UNSAT
STEP 26: WHEN PRT pressure is < 3 psig, THEN close RC-549. (Step 6.3.2.3) STANDARD: RC-549 closed indicated by green light above the RTGB control switch. COMMENTS: **END OF TASK**	**CRITICAL STEP** ____ SAT ____ UNSAT

TIME STOP: ________

EXAMINER NOTE: Debrief the operator regarding use of time compression when draining / cooling the PRT

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The unit was at 100% when PZR PORV PCV-456 failed open approximately 30 minutes ago.

The crew responded IAW the appropriate plant procedures. Plant conditions are now stable.

INITIATING CUES:

The CRSS has directed you to restore PRT parameters to normal operating conditions IAW OP-103.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-109

Control Room Response to a Plant Fire On Site

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the Control Operator's Control Room response to a plant fire on site IAW FP-001
000*067*R5*01
Operate the Fire Detection / Alarm equipment IAW APP-044
086*007*R1*01

Alternate Path:

N/A

Facility JPM #:

JPM CR-109
RO / SRO

K/A Rating(s):

APE 067 - AK3.02 -2.5/3.3 067 - AA1.05 3.0/3.1
067 - AA1.06 3.5/3.7

Task Standard:

Actions taken to mitigate a plant fire on-site IAW plant procedures

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator __X__ In-Plant ______ Perform __X__ Simulate ______

References:

APP-044-B26, ZN-17 Fire Alarm TRN-A HVAC Equipment Room For Cont. Room
APP-044-B89, ZN-17 Fire Alarm TRN-B HVAC Equipment Room For Cont. Room
FP-001, Fire Emergency

Validation Time: 15 min. **Time Critical:** No

Candidate: ______________________________ Time Start: ________
NAME Time Finish: ________

Performance Rating: SAT ______ UNSAT ______ Performance Time: ________

Examiner: ________________________ ____________________________/________
NAME SIGNATURE DATE

COMMENTS

Step 6
Critical because Control Room ventilation isolation is required to ensure habitability

Step 7 / 19*
Critical because Fire Brigade activation is required for both fire detection trains in the alarm condition

Step 8, 20*
Critical because Control Room operator action required to ensure PA system is placed in Emergency Mode

Step 9, 10, 20*
Critical because Control Room operator must alert the Fire Brigade and station of the fire

Step 11 / 21*
Critical because Electric Motor Driven Fire Pump is manually started from the Control Room

Step 33
Critical because Control Room operator action is required to sound the ALL CLEAR alarm

Step 34
Critical because Control Room operator action is required to secure the Electric Motor Driven Fire Pump

If action is taken per Attachment 7.3, the following steps are not critical:

19
20
21

If action is taken per Section 6.3, the following steps are not critical:

7
8
9
10
11

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize simulator to IC - 5, activate CAEP 88_JPM_CR_109_R0, go to RUN
2. Freeze simulator.
3. Place simulator in run when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

Update the Control Room Status Board to IC-5 Chemistry Sheet

The CAEP has the following triggers included:

- E1 (88_JPM_CR_109): When HVE-16 control switch is placed in STOP, APP-044-B89 (Zone 17 Train B) will alarm.

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

APP-044-B26, ZN-17 Fire Alarm TRN-A HVAC Equipment Room For Cont. Room
APP-044-B89, ZN-17 Fire Alarm TRN-B HVAC Equipment Room For Cont. Room
FP-001, Fire Emergency

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The plant is at 100% power, all systems aligned for normal operation

INITIATING CUES:

You are to respond to events as they occur.

START TIME: _______

STEP 1: Silence Fire Alarm Console alarm. STANDARD: Fire Alarm Computer silenced by depressing F2 **EXAMINER'S NOTE: The Fire alarm will occur ~25 seconds after the simulator is placed in RUN.** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of APP-044-B26. **Hand the operator a copy of the procedure after he/she locates it.** **EXAMINER'S NOTE: Operator may reference FP-001 Attachment 7.3.** COMMENTS:	____ SAT ____ UNSAT
STEP 3: Immediately dispatch FP Tech. Aide or closest Fire Brigade Member to investigate cause of alarm. Reference FP-001. (APP-044-B26, Step 1) STANDARD: Operator dispatches the FP Tech. Aide / Fire Brigade Member to the Control Room HVAC Equipment Room to investigate. **BOOTH INSTRUCTOR'S CUE: Respond as the individual dispatched that you are en-route to the Control Room HVAC Equipment Room.** **If called, respond as Security that you are en-route to the Control Room HVAC Equipment Room to unlock the Security Door.** **EXAMINER NOTE: The door into the Control Room HVAC Equipment Room does not have a key-card entry. The Auxiliary Operators carry a plastisol-covered security key for emergency use.** COMMENTS:	____ SAT ____ UNSAT

STEP 4: IF an additional alarm on opposite train is received, THEN activate the Fire Brigade per FP-001. (Step 2) STANDARD: Fire Brigade not activated, no other alarms indicated on Fire Alarm Computer at the present time. COMMENTS:	____ SAT ____ UNSAT
STEP 5: IF smoke renders the Control Room inaccessible, THEN Go To AOP-004, CONTROL ROOM INACCESSIBILITY. (Step 3) STANDARD: Control Room Evacuation not required. **EXAMINER'S CUE: The faint odor of smoke is present in the Control Room.** **EXAMINER'S NOTE: The operator may dispatch Fire Brigade (sound the Fire Alarm) based on smoke in the Control Room** COMMENTS:	____ SAT ____ UNSAT
STEP 6: IF small amounts of smoke enter the Control Room, THEN isolate the Control Room from the HVAC Equipment Room as follows: (Step 4.1 thru 4.5) 1. Stop HVA-1A, CONT RM AIR HANDLING unit 2. Stop HVA-1B, CONT RM AIR HANDLING unit 3. Close OUTSIDE AIR DAMPER "A" 4. Close OUTSIDE AIR DAMPER "B" 5. Stop HVE-16, CONT RM AIR EXHAUST STANDARD: 1. HVA-1A control switch placed in STOP, green light illuminated 2. HVA-1B control switch placed in STOP, green light illuminated 3. OUTSIDE AIR DAMPER "A" control switch placed in CLOSE, green light illuminated 4. OUTSIDE AIR DAMPER "B" control switch placed in CLOSE, green light illuminated 5. HVE-16 control switch placed in STOP, green light illuminated **BOOTH INSTRUCTOR'S CUE: The 2nd train Fire Alarm (APP-044-B89) is triggered to actuate when the HVE-16 control switch is placed in STOP.** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 7: Silence Fire Alarm Console alarm. Activate the Fire Brigade per FP-001. (Step 2) STANDARD: Fire Alarm Console silenced by depressing F2. Operator determines 2nd alarm on Control Room HVAC Equipment Room and obtains FP-001, Attachment 7.3, Control Room Fire Emergency Guide and Emergency Phone Numbers. Operator may refer to APP-044-B89 or go to directly to FP-001. **EXAMINER'S CUE: Hand the operator a copy of FP-001, after he/she locates it.** **EXAMINER'S NOTE: The operator may perform the actions listed on Attachment 7.3, Control Room Fire Emergency Guide and Emergency Phone Numbers, or go directly to Section 6.3. (Turn to JPM Step 16 for direct entry in Section 6.3)** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

NOTE: Portable radios, cell phones, and beepers are available for Fire Brigade notification if the PA system or plant alarms are malfunctioning.

STEP 8: Place the VLC Switch in the "EMERGENCY" position (FP-001, ATT. 7.3, Step C, 1st dash) STANDARD: VLC Switch placed in EMERGENCY. COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

STEP 9: Sound the FIRE ALARM and perform a site wide announcement over the Plant PA (ATT.7.3, Step C, 2nd & 3rd dash) ATTENTION FIRE BRIGADE PERSONNEL. ATTENTION FIRE BRIGADE PERSONNEL. A FIRE HAS BEEN REPORTED AT THE CONTROL ROOM HVAC EQUIPMENT ROOM. STANDARD: Fire Alarm control switch placed in ALARM for 15 seconds and then returned to the MID position. Operator then makes a plant announcement using the PA system. COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT
STEP 10: Sound the FIRE ALARM a second time and repeat the above message. (ATT. 7.3, Step C, 4th dash) STANDARD: Fire Alarm control switch placed in ALARM for 15 seconds and then returned to the MID position. Operator then makes a plant announcement using the PA system. **BOOTH INSTRUCTOR'S CUE: After the 2nd Fire alarm and PA announcement, call the Control Room as the dispatched individual (from Step 3 above) and report heavy smoke in the Control Room HVAC Equipment Room** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

NOTE: The Engine Driven Fire Pump will automatically start if the Motor Fire Pump cannot maintain system pressure.

STEP 11: Start Electric Motor Driven Fire Pump. (ATT. 7.3, Step F) STANDARD: Electric Motor Driven Fire Pump started by placing the control switch on Containment FP System Panel to the right position observing the red light illuminated. COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

STEP 12: Evaluate the need to evacuate plant personnel. Use Local or Site evacuation as needed. (ATT. 7.3, Step G) STANDARD: Based on conservative decision making, the operator may sound the Local evacuation alarm and announce the evacuation of the Control Room HVAC Equipment Room COMMENTS:	____ SAT ____ UNSAT
STEP 13: Notify the RESS Duty Manager, who will notify the RESS Fire Protection Staff and other RESS personnel as necessary (CR 96-01227). (ATT. 7.3, Step H) STANDARD: Operator informs the Control Room supervision to notify the RESS Duty Manager. **EXAMINER'S CUE: If requested, acknowledge notify the RESS Duty Manager** COMMENTS:	____ SAT ____ UNSAT
STEP 14: IF Team Leader requests additional fire fighting assistance THEN call back at least four (4) off shift Fire Brigade personnel. A Team Leader should be called back for each four (4) Fire Brigade Members recalled and/or call the Hartsville Fire Department if needed (see Attachment 7.2). (ATT. 7.3, Step I) **BOOTH INSTRUCTOR'S CUE: As the Fire Brigade Leader, call the Control Room and report:** • **Additional fire fighting assistance will not be required** • **There was no fire, heavy smoke only. Re-flash watch is stationed** • **Apparent cause is the belt on HVA-1A** • **The room has been ventilated** STANDARD: Operator determines no additional assistance is required. COMMENTS:	____ SAT ____ UNSAT

STEP 15: Also see Section 6.3 for additional information. (Step J) STANDARD: Operator refers to Section 6.3. **EXAMINER'S NOTE: If the operator used Attachment 7.3 to perform the initial actions, he/she will refer to Section 6.3 now. Some of the actions in this section will have already been performed by the Annunciator Panel Procedures (APPs) and Attachment 7.3.** COMMENTS:	____ SAT ____ UNSAT
STEP 16: IF indications suggest a fire in the Containment Building, THEN perform the following: (Step 6.3.1) STANDARD: Operator determines there is no indication of fire in the Containment Building. COMMENTS:	____ SAT ____ UNSAT
STEP17 : IF a single Train "A" OR Train "B" alarm on the Fire Alarm Console is received, THEN dispatch the Fire Protection Auxiliary Operator (FPAO) OR a Fire Brigade member to investigate AN report conditions to the Control Room. (Step 6.3.2) STANDARD: Operator dispatches the FP Tech. Aide / Fire Brigade Member to the Control Room HVAC Equipment Room to investigate. **EXAMINER'S NOTE: Could have been performed per ATT. 7.3** COMMENTS:	____ SAT ____ UNSAT

NOTE: Based on information available, the Superintendent Shift Operations can direct other people or groups as needed to deal with situations outside the Fire Brigade response area.

STEP 18: IF a fire is reported outside of the Fire Brigade Response Area, (see Attachment 7.5) THEN perform the following: (Step 6.3.3) STANDARD: Operator determines the fire is inside the Fire Brigade Response Area. COMMENTS:	____ SAT ____ UNSAT
STEP 19: IF any of the following are met, THEN immediately dispatch the Fire Brigade IAW Step 6.3.5 (RAIL 94R0638): (Step 6.3.4) • a verbal report is received in the Control Room of an existing fire in the plant • a second train alarm is received • a system actuation (CO_2, Halon, deluge, pre-action sprinkler system) is received. STANDARD: Operator determines 2nd train alarm on Control Room HVAC Equipment Room and dispatches the Fire Brigade per Step 6.3.5. **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step is NOT critical** COMMENTS:	**CRITICAL STEP *** ____ SAT ____ UNSAT

NOTE: Portable radios, cell phones, and beepers are available for Fire Brigade notification if the PA system or plant alarms are malfunctioning.

STEP 20:	IF the Control Room determines a Fire Brigade response is required, THEN perform the following: (Step 6.3.5) • Place the VLC Switch in the "EMERGENCY" position and sound the fire alarm for 15 seconds • Announce the location and nature of the fire over the plant P.A. system. • Sound the fire alarm again for 15 seconds and repeat the message. • Notify the Superintendent Shift Operations.	**CRITICAL STEP *** ____ SAT
STANDARD:	VLC Switch placed in EMERGENCY. Fire Alarm control switch placed in ALARM for 15 seconds and then returned to the MID position. Plant announcement using the PA system made. Fire alarm and announcement repeated a second time Superintendent Shift Operations notified	____ UNSAT
EXAMINER'S CUE:	**Acknowledge notification (as Superintendent Shift Operations) of the dual train fire alarm in the Control Room HVAC Equipment Room**	
EXAMINER'S NOTE:	**If action taken IAW ATT. 7.3, then this step is NOT critical**	
COMMENTS:		

NOTE: The Engine Driven Fire Pump will automatically start if the Motor Fire Pump cannot maintain system pressure.

STEP 21:	Verify the Motor Driven Fire Pump is started. (Step 6.3.6)	**CRITICAL STEP ***
STANDARD:	Electric Motor Driven Fire Pump started by turning the control switch on the Containment FP System Panel to the right position and observing the red light illuminated.	____ SAT
BOOTH INSTRUCTOR'S CUE:	**As the Fire Brigade Leader, call the Control Room and report:** • **Additional fire fighting assistance will not be required** • **There was no fire, heavy smoke only. Re-flash watch is stationed** • **Apparent cause is the belt on HVA-1A** • **The room has been ventilated**	____ UNSAT
EXAMINER'S NOTE:	**If action taken IAW ATT. 7.3, then this step is NOT critical**	
COMMENTS:		

STEP 22: IF the fire emergency is of an extended duration AND the Engine Driven Fire Pump is operating, THEN perform the following: (Step 6.3.7) • Dispatch an operator to the intake as available • Contact an off-shift Fire Brigade member to man the fire pumps STANDARD: Operator determines the fire is not of an extended duration. COMMENTS:	____ SAT ____ UNSAT
STEP 23: Review the applicable Fire Protection Preplans to determine potential hazards and consequences within the reported area. (Step 6.3.8) STANDARD: Operator determines reference to the Pre-Plan is not required **EXAMINER'S NOTE: The operator has received a report that there is no fire.** COMMENTS:	____ SAT ____ UNSAT
STEP 24: VERIFY the plant is in a safe condition corresponding to the existing or potential consequences of the fire on safe plant condition. (Step 6.3.9) STANDARD: Plant is steady-state. Control Room HVAC is secured. **EXAMINER'S NOTE: The operator may consider starting the other train of Control Room HVAC.** **BOOTH INSTRUCTOR CUE: As the FB leader, call the CR and report fire suppression equipment can be restored to normal operational status.** COMMENTS:	____ SAT ____ UNSAT
STEP 25: IF the fire is in the Control Room, Auxiliary Building or CV, THEN refer to DSP-001 entry conditions. (Step 6.3.10) STANDARD: N/A, fire is not in the Control Room, Auxiliary Building, or CV COMMENTS:	____ SAT ____ UNSAT

<u>STEP 26</u>: IF a "confirmed" fire is located in any Reactor Auxiliary Building fire area, THEN verify the associated ventilation equipment is shutdown by either using the equipments's switch OR by opening the supply breaker. (Step 6.3.11) <u>STANDARD</u>: N/A, fire is not located in the Reactor Auxiliary Building. <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 27</u>: Implement the EALs (Step 6.3.12) <u>STANDARD</u>: Operator informs the Superintendent Shift Operations to implement the EALs. **EXAMINER'S CUE: Acknowledge (as the Superintendent Shift Operations) to implement the EALs** <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 28</u>: Notify the RESS Duty Manager, who will notify the RESS Fire Protection Staff and other RESS personnel as necessary. (CR 96-01227) (Step 6.3.13) <u>STANDARD</u>: Operator informs the Control Room supervision to notify the RESS Duty Manager. **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step was already performed** <u>COMMENTS</u>:	____ SAT ____ UNSAT
<u>STEP 29</u>: IF there is a large or unusual fire AND the Team Leader requests assistance, THEN immediately call in off-shift Fire Brigade members. A Team Leader should be called in for each four Fire Brigade members. If Hartsville Fire Department assistance is needed, see Attachment 7.2. (Step 6.3.14) <u>STANDARD</u>: Operator determines no assistance required. **EXAMINER'S NOTE: If action taken IAW ATT. 7.3, then this step was already performed** <u>COMMENTS</u>:	____ SAT ____ UNSAT

STEP 30: IF it is necessary to admit an emergency vehicle(s) into the Protected Area THEN use the following guidelines to expedite entry (SP-008): (Step 6.3.15) STANDARD: Operator determines no emergency vehicles required to enter the Protected Area. **BOOTH INSTRUCTOR'S CUE: As the Fire Brigade Leader, call the Control Room and recommend sounding the ALL CLEAR** COMMENTS:	____ SAT ____ UNSAT
STEP 31: IF the fire involves potentially hazardous materials, THEN ensure that the fire brigade activities are limited to fire suppression and spill confinement. (Step 6.3.16) STANDARD: Operator determines no hazardous materials are involved. COMMENTS:	____ SAT ____ UNSAT
STEP 32: IF the situation involves hazardous materials, THEN perform the following: (Step 6.3.17) STANDARD: Operator determines no hazardous materials are involved. COMMENTS:	____ SAT ____ UNSAT
STEP 33: WHEN recommended by the Fire Brigade Team Leader, THEN sound the ALL CLEAR alarm for 5 seconds and announce the status of the fire (ACR 94-614) (Step 6.3.18) STANDARD: ALL CLEAR alarm sounded for 5 seconds by placing the control switch in the ALL CLEAR position and back to MID COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 34:	WHEN the fire is extinguished, THEN direct recovery to normal plant operation giving consideration to the following: (Step 6.3.19) • Need for fire watches while fire detection and suppression systems are out of service. • Restoring fire detection and fire suppression systems to normal operational alignment in accordance with governing system Operating Procedures.	____ SAT
STANDARD:	Electric Motor Driven Fire Pump secured by placing the control switch on Containment FP System Panel to the left position and observing the green light illuminated	____ UNSAT
COMMENTS:		
STEP 35:	VERIFY post fire activities include the preservation of evidence and the fire scene IAW PLP-113. (CR 96-01227) (Step 6.3.20)	
STANDARD:	Operator directs the Fire Brigade Team Leader to VERIFY post fire activities include the preservation of evidence and the fire scene IAW PLP-113.	____ SAT
EXAMINER'S CUE: JPM is complete.		
COMMENTS:		____ UNSAT
	END OF TASK	

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is at 100% power, all systems aligned for normal operation

INITIATING CUES:

You are to respond to events as they occur.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM CR-110

Respond to ATWS Event

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform the immediate actions for a Reactor Trip or Safety Injection IAW PATH-1
000*007*R5*01

Alternate Path:

Reactor will not automatically trip when required
Reactor will not trip from the right hand side pushbutton
Turbine will not trip from the RTGB

Facility JPM #:

JPM CR-110
RO / SRO

K/A Rating(s):

004 A4.18	4.3/4.1	029 EA1.09	4.0/3.6
000 EA1.01	3.4/3.1	029 EA1.12	4.1/4.0
000 EA1.08	4.5/4.5	029 EA1.14	4.2/3.9
000 EA1.09	4.0/3.6	029 EA1.15	4.1/3.9
000 EA1.12	4.1/4.0	029 EA2.05	3.4/3.4
000 EA1.13	4.1/3.9	029 EA2.07	4.2/4.3
029 EA1.01	3.4/3.1	2.4.49	4.0/4.0

Task Standard:

Immediate actions associated with an ATWS condition performed IAW PATH-1

Preferred Evaluation Location: Simulator __X__ In-Plant ______

Preferred Evaluation Method: Perform __X__ Simulate ______

References:

PATH-1

Validation Time: 10 min. **Time Critical:** No

Candidate: ____________________________
NAME

Overall Time
Start: __________
Finish: __________

Performance Time (min): __________

Examiner: ____________________ ____________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 4
Critical because operator must determine an automatic reactor trip signal was initiated and the reactor failed to trip

Step 6
Critical because prompt operator action is required (by memory) to insert negative reactivity to the reactor

Step 8
Critical because prompt operator action is required (by memory) to trip/runback the turbine in the event of a failure of the turbine to trip

Step 9
Critical because operator action is required (by memory) to verify at least 1 emergency bus is energized

Step 10
Critical because operator action is required (by memory) to determine if SI has initiated or is required

SIMULATOR OPERATOR INSTRUCTIONS:

1. Initialize the simulator to IC-5, go to RUN, and activate CAEP 88_JPM_CR_004_R7_POTEET

2. If CAEP is not functioning, perform the following:
   - activate IMF RPS01A and 01B...failure to open in BOTH auto and manual
   - activate IMF TUR02A, B, C... failure of the turbine to trip
   - activate IMF TUR21B ...failure of OTΔT Runback
   - Place the simulator in FREEZE.

3. Place simulator in RUN when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

The CAEP has the following triggers included:

- E3 (88_JPM_CR_004_3): When the left hand side Reactor Trip pushbutton is depressed, the reactor trip breakers will open

- E2 (88_JPM_CR_004_2): When Control Bank "D" reaches 208 steps, the reactor trip breakers will open. (This trigger provides a contingency in case the operator drives rods instead of depressing both pushbuttons.)

SEE ABOVE AND IN EACH STEP

Tools/Equipment/Procedures Needed:

PATH-1

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The unit is at 100% power. All controls are in auto/normal. No equipment is out-of-service.
2. You are the Reactor Operator <u>and</u> the BOP (the BOP has left the Control Room).

INITIATING CUES:

You are to respond to events as they occur

START TIME: ______

EXAMINER'S NOTE: This scenario starts at 100% power. Approximately 20 seconds after the simulator is placed in RUN, an 800 gpm RCS leak will occur. The operator will attempt to respond to annunciators as they occur. A second Charging Pump may be started to address excessive RCS leakage. The annunciators and bistables associated with OTΔT will alarm, however the runback and reactor trip will fail to occur. The operator should then realize an ATWS event is occurring.

<table>
<tr><td>
<u>STEP 1</u>: APP-003-F4, CHG PMP HI SPEED alarms due to lowering RCS pressure

<u>STANDARD</u>: Operator:
• acknowledges/silences alarm
• determines RCS pressure is decreasing by observing PI-444, 445, 455, 456, 457
• determines PZR level is decreasing by observing LI-460, 461, 459A
• will check APP-003-F4
may start an additional Charging Pump
may enter AOP-016

<u>BOOTH INSTRUCTOR'S NOTE:</u> Initiate 800 gpm RCS Leak ~20 seconds after the simulator is placed in RUN.
IMF RCS09A ... 800

<u>COMMENTS</u>:
</td><td>
____ SAT

____ UNSAT
</td></tr>
<tr><td>
<u>STEP 2</u>: The following annunciators alarm due to lowering RCS pressure and level:
• APP-003-D8, PZR CONTROL HI/LO PRESS
• APP-003-E8, PZR CONTROL HI/LO LVL

<u>STANDARD</u>: Operator determines:
• RCS leakage in progress
• starts a second (or third) Charging Pump
• all PZR Heaters are energized, Spray valves are closed
• entry into AOP-016, Excessive RCS Leakage is required

<u>EXAMINER'S NOTE:</u> Operator may attempt manual reactor trip due to rapid RCS pressure reduction

<u>COMMENTS</u>:
</td><td>
____ SAT

____ UNSAT
</td></tr>
</table>

STEP 3: APP-005-D5, OPΔT/OTΔT TURBINE RUNBACK ROD STOP alarms due to lowering RCS pressure STANDARD: Operator determines: • OTΔT Rod Stop and Turbine Runback setpoint & coincidence satisfied • Turbine Runback not in progress **EXAMINER'S NOTE: Due to the pace of the transient, the operator may not have time to diagnose the runback.** COMMENTS:	____ SAT ____ UNSAT
STEP 4: APP-004 - E3, OVERTEMP ΔT TRIP (First Out Annunciator) alarms STANDARD: Operator determines the reactor failed to automatically trip by observing: • the First Out Annunciator and / or • the Reactor Trip Breaker red & green breaker indicating lights extinguished **EXAMINER'S NOTE: PZR pressure ~ 2080 psig** **RCS Tave ~ 574°F** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 5: REACTOR TRIPPED: (Step 1) STANDARD: The operator determines the reactor is not tripped • Reactor Trip Main Breakers - no indication • Rod Position indication CBD-218 • Rod Bottom lights NOT illuminated • Neutron Flux ~ 100% COMMENTS:	____ SAT ____ UNSAT

STEP 6:	TRIP REACTOR (Step 1 RNO)	**CRITICAL STEP**
STANDARD:	The operator depresses the pushbuttons on the RTGB. The reactor trips after the left hand pushbutton is depressed	____ SAT
COMMENTS:		____ UNSAT
STEP 7:	TURBINE TRIPPED: (Step 2)	
STANDARD:	The operator determines the Turbine is NOT Tripped • Both Turbine Stop valves are open • All Governor valves indicate open	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	TRIP OR RUNBACK TURBINE (Step 2 RNO)	**CRITICAL STEP**
STANDARD:	Operator: • depresses the THINK and TURBINE TRIP pushbuttons and determines the turbine will not trip by observing the Stop and Governor valves open • manually runs back the turbine by depressing the following pushbuttons on the EH Turbine Control Panel: • LIMIT ⇓ OR • GV ⇓ AND GV FAST	____ SAT ____ UNSAT
COMMENTS:		
STEP 9:	E1 AND E2 ENERGIZED (Step 3)	**CRITICAL STEP**
STANDARD:	Operator determines E1 and E2 are energized by observing the red breaker closed lights on the RTGB at switches for E1 & E2 480V BUS MAIN (52/18B & 28B)	____ SAT
COMMENTS:		____ UNSAT

STEP 10: SI INITIATED (Step 4) STANDARD: Operator determines SI has initiated by observing any of the following: • APP-004-D1, PZR LO PRESS SFGRD/TRIP • SI Pumps running • Emergency Diesel Generator White Start light illuminated **EXAMINER'S NOTE: RCS pressure ~ 1100 psig** **EXAMINER'S CUE: After the operator states Immediate Actions are complete, terminate the JPM** COMMENTS: **END OF TASK**	**CRITICAL STEP** _____ SAT _____ UNSAT

TIME STOP: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The unit is at 100% power. All controls are in auto/normal.
2. No equipment is out-of-service.
3. You are the Reactor Operator and the BOP (the BOP has left the Control Room).

INITIATING CUES:

You are to respond to events as they occur

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM IP-002

SHIFT AUXILIARY FEEDWATER PUMP SUCTION TO SERVICE WATER

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Shift Auxiliary Feedwater Pump Suction to Service Water.
000*054*R5*01
061*007*R1*04

Alternate Path:

N/A

Facility JPM #:

JPM IP-002
AO / RO / SRO

K/A Rating(s):

061 K1.07	3.6/3.8
054 AA1.01	4.5/4.4

Task Standard:

Auxiliary Feedwater Pump Suction aligned to Service Water IAW OP-402, Section 8.1

Preferred Evaluation Location: Simulator ______ In-Plant __X__

Preferred Evaluation Method: Perform ______ Simulate __X__

References:

1. OP-402, Section 8.1
2. EOP Path-1, Foldout A.

Validation Time: 15 min. **Time Critical:** Yes (15 min.)

Candidate: ______________________________
NAME

	Overall Time	Critical Time
Start:	________	________
Finish:	________	________
Performance Time (min):	________	________

Examiner: ______________________ ______________________ / ________
NAME SIGNATURE DATE

COMMENTS

Step 3
Critical because CST must be isolated to provide Emergency B/U suction from SW.

Step 4
Critical because CST must be isolated to provide Emergency B/U suction from SW.

Step 5
Critical because AFW-24A must be closed to prevent SW from flowing into CCW Pump Room and filling Sump/WHUT.

Step 6
Critical because AFW-24 must be open to provide SW flow to AFW Pumps Suction.

Step 7
Critical because SW-118 must be open to provide SW flow to AFW Pumps Suction.

Tools/Equipment/Procedures Needed:

OP-402, Section 8.1 with Step 8.1.1 completed.
The Operator, as the Inside AO, would have the Inside AO Key Ring with Locked Valve Key to simulate unlocking valves.

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

INITIAL CONDITIONS:

1. You are the Inside Auxiliary Operator (IAO)
2. The plant is in hot shutdown due to a ruptured Condensate Storage Tank
3. All (3) AFW pumps have been stopped
4. Step 8.1.1 of OP-402 is complete

INITIATING CUES:

You have been dispatched from the Control Room to establish Service Water as the suction supply to the Auxiliary Feedwater system in accordance with OP-402, Section 8.1 up to but not including venting AFW Pumps

START TIME: _______ **TIME CRITICAL START TIME:** _______

STEP 1: Verify the AFW Pumps are STOPPED (Step 8.1.2.1) • SDAFW • MDAFW Pump "A" • MDAFW Pump "B" STANDARD: Operator determines all AFW Pumps are stopped from initial conditions EXAMINER'S CUE: **If operator calls the Control Room to verify all AFW Pumps are stopped, inform him/her all are stopped.** COMMENTS:	___ SAT ___ UNSAT

NOTE: Closing AFW-1, AFW PUMPS SUCTION FROM CST OR AFW-104, AFW PUMPS SUCTION FROM CST in the next step renders the AFW pumps inoperable (ITS LCO 3.7.4 and ITS SR 3.7.4.1)

STEP 2: Notify the CRSS/SSO that an Action Statement will be entered and record the time (Step 8.1.2.2) STANDARD: Operator contacts the CRSS/SSO and informs him the Action Statement will be entered and records the time EXAMINER'S CUE: **The CRSS/SSO acknowledges the report from the Operator.** **If operator calls the Control Room or the Outside Auxiliary Operator to close AFW-1 & 104, inform him/her the OAO is already busy and he/she will have to perform these actions.** COMMENTS:	___ SAT ___ UNSAT

STEP 3: Unlock AND close AFW-1, AFW PUMPS SUCTION FROM CST (Step 8.1.2.3.a) STANDARD: Operator simulates unlocking and closing AFW-1 by turning the handwheel in the fully clockwise direction and observing stem insertion **EXAMINER'S NOTE: Operator has Inside AO Key Ring with Locked Valve Key** **EXAMINER'S CUE: AFW-1 is unlocked and the valve stem is fully inserted and valve will not travel any further in the clockwise direction** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Unlock AND close AFW-104, AFW PUMPS SUCTION FROM CST (Step 8.1.2.3.b) STANDARD: Operator simulates unlocking and closing AFW-104 by turning the handwheel in the fully clockwise direction and observing stem fully inserted **EXAMINER'S CUE: AFW-104 is unlocked and the valve stem is fully inserted and valve will not travel any further in the clockwise direction** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Close AFW-24A, AFW SUCTION FROM SW EMERGENCY B/U TELL-TAIL DRAIN (Step 8.1.2.3.c) STANDARD: Operator simulates closing AFW-24A by turning the handwheel in the fully clockwise direction and observing stem fully inserted **EXAMINER'S CUE: AFW-24A valve stem is fully inserted and valve will not travel any further in the clockwise direction** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6: Unlock AND open AFW-24, AFW SUCTION FROM SW EMERGENCY B/U (Step 8.1.2.3.d) STANDARD: Operator simulates unlocking and opening AFW-24 by turning the handwheel in the fully counter-clockwise direction and observing stem fully withdrawn, then turning ~1/2 turn clockwise to remove from backseat **EXAMINER'S CUE:** **AFW-24 valve stem is fully withdrawn, and valve will not travel any farther in the counter-clockwise direction (and removed from the backseat if the operator performs this action)** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Unlock AND open SW-118, SW EMERGENCY B/U TO AFW SUCTION (Step 8.1.2.3.e) STANDARD: Operator simulates unlocking and opening SW-118 by turning the handwheel in the fully counter-clockwise direction and observing stem fully withdrawn, then turning ~1/2 turn clockwise to remove from backseat **EXAMINER'S CUE:** **SW-118 valve stem is fully withdrawn and valve will not travel any farther in the counter-clockwise direction (and removed from the backseat if the operator performs this action)** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME: __________ **TIME CRITICAL STOP TIME:** __________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. You are the inside Auxiliary Operator
2. The plant is in Hot Shutdown due to ruptured Condensate Storage Tank
3. All (3) AFW pumps have been stopped
4. Step 8.1.1 of OP-402 is complete

INITIATING CUES:

You have been dispatched from the Control Room to establish Service Water suction supply to the Auxiliary Feedwater system in accordance with OP-402, Section 8.1 up to but not including venting AFW Pumps

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM IP-007

Energize DS Bus IAW EPP-22

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Energize Dedicated Shutdown Bus IAW EPP-022
000*222*R5*01
000*055*R5*04

Alternate Path:

N/A

Facility JPM #:

JPM IP-007

K/A Rating(s):

062 A2.05 2.9/3.3
062 A4.02 2.5/2.8
062 A4.04 2.6/2.7
064 A4.06 3.9/3.9

Task Standard:

The Dedicated Shutdown (DS) Bus is energized from the Dedicated Shutdown Diesel Generator (DSDG) IAW EPP-022

Preferred Evaluation Location: Simulator ______ In-Plant __X__

Preferred Evaluation Method: Perform ______ Simulate __X__

References:

EPP-001, Loss of All AC Power
EPP-22, Energizing Plant Equipment Using Dedicated Shutdown Diesel Generator

Validation Time: 9 min. **Time Critical:** No

Candidate: ______________________________ NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT ______ UNSAT ______

Performance Time: ________

Examiner: ______________________ NAME ______________________ SIGNATURE / ________ DATE

COMMENTS

Step 3
Critical because racking out this breaker is required to prevent an automatic start of the A CCW Pump

Step 4
Critical because fuel prime necessary to ensure adequate fuel supply/pressure to the DSDG engine for starting

Step 5
Critical because manual action required to start the DSDG

Step 6
Critical because prompt manual action required to raise engine speed to normal operating speed

Step 8
Critical because manual action required to energize the DS Bus by closing the DSDG output breaker

Tools/Equipment/Procedures Needed:

Two-Way Radio
Flashlight
Simulated Key Set #178
EPP-22, Energizing Plant Equipment Using Dedicated Shutdown Diesel Generator

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps , including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

The plant has lost onsite and offsite AC power
EPP-1 (Loss of All AC Power) has been implemented
EPP-1 has directed entry into EPP-22 to energize plant equipment using the DSDG
All equipment in Step 1 of EPP-22 has been obtained from the Control Room

INITIATING CUES:

The CRSS has directed you to perform the steps of EPP-22 necessary to energize the DS Bus.

START TIME: _______

CAUTION: Normal Security and Radiation Protection Procedures are not applicable during the performance of this procedure.
A loss of DC power may occur if the DC Busses are at maimum load and the Battery Chargers are not restarted within 60 minutes of a loss of all AC power.

NOTE: This procedure is to be completed as rapidly as possible following a loss of all AC power.

STEP 1: Obtain The Following Prior To Leaving The Control Room (Step 1) • Two-Way Radio • Flashlight • Key Set #178, #179, or #180 STANDARD: Operator obtains a radio, flashlight and key set prior to leaving the Control Room EXAMINER'S CUE: **Inform the operator that ALL Security and Radiation Protection procedures ARE APPLICABLE for the purpose of this simulated activity** **Hand the operator:** • **Two-Way Radio** • **Flashlight** • **Simulated Key Set #178** COMMENTS:	___ SAT ___ UNSAT

STEP 2: Trip the following Breakers (Step 2.a) • FEED TO 480V BUS DS (CMPT-32A) • SERVICE WATER PUMP D (ALT POWER) (CMPT-33B) • COMPONENT COOLING WATER PUMP A (CMPT-33C) • CHARGING PUMP A (CMPT-34B) • FEED TO MCC-5 (ALT POWER) (CMPT-34C) STANDARD: At the DS Bus, the operator locates the following breakers, determines the breaker is open by observing the OPEN flag in the breaker status window or depresses the TRIP pushbutton on the breaker cubicle door: • FEED TO 480V BUS DS (CMPT-32A) • SERVICE WATER PUMP D (ALT POWER) (CMPT-33B) • COMPONENT COOLING WATER PUMP A (CMPT-33C) • CHARGING PUMP A (CMPT-34B) • FEED TO MCC-5 (ALT POWER) (CMPT-34C) **EXAMINER'S CUE:** **After the operator locates each breaker and depresses it's TRIP pushbutton, inform him the OPEN flag is present in the breaker status window.** COMMENTS:	___ SAT ___ UNSAT
STEP 3: Rack out Breaker COMPONENT COOLING PUMP A (CMPT-33C) (Step 2b) STANDARD: Breaker COMPONENT COOLING PUMP A (CMPT-33C) racked out by simulating the insertion of the breaker levering tool and rotating counter-clockwise until the breaker position tab indicates DISC **EXAMINER'S CUE:** **After the operator locates and simulates inserting the tool into the breaker and turning it counter-clockwise, inform him/her the breaker is racked out** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

CAUTION: DSDG speed should be increased to 900 rpm as soon as possible to prevent possible voltage regulator damage.

NOTE: APP-025, DEDICATED SHUTDOWN DIESEL GENERATOR ANNUNCIATOR PANEL, will NOT be energized until the DS Bus is energized.
Breaker 52/32B, DEDICATED SHUTDOWN DIESEL GENERATOR TO 480V BUS DS (ALT POWER), can NOT be closed locally at the breaker.

STEP 4: Press AND hold the FUEL PRIME Pushbutton for approximately 20 seconds (Step 3.a) STANDARD: In the 4160V Switchgear Room at the DSDG Control Panel, the operator simulates pressing and holding the Fuel Prime Pushbutton for at least 20 seconds **EXAMINER'S CUE:** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Start the DS Diesel by depressing the START Pushbutton (Step 3.b) STANDARD: In the 4160V Switchgear Room at the DSDG Control Panel, the operator simulates depressing the START pushbutton **EXAMINER'S CUE: After the operator simulates depressing the start pushbutton, inform him/her that DSDG speed indicates 450 rpm** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Adjust engine speed to 900 rpm using the DIESEL GEN GOVERNOR SWITCH (Step 3.c) STANDARD: In the 4160V Switchgear Room at the DSDG Control Panel, the operator simulates increasing DS Engine speed to 900 rpm by momentarily placing the Diesel Gen Governor switch to the RAISE position **EXAMINER'S CUE: After the operator simulates momentarily placing the Diesel Gen Governor switch in the Raise position, inform him/her that engine speed indicates 900 rpm** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 7: Check VOLTMETER DIESEL OUTPUT - APPROXIMATELY 480 VOLTS (Step 3.d) STANDARD: Operator locates the VOLTMETER DIESEL OUTPUT and determines it indicates 480 volts **EXAMINER'S CUE: After operator locates the VOLTMETER DIESEL OUTPUT inform him/her it indicates 480 volts** COMMENTS:	___ SAT ___ UNSAT
STEP 8: Place CONTROL SWITCH 52/32B DIESEL BREAKER to CLOSE (Step 3.e) STANDARD: Operator locates the DSDG output breaker 52/32B and simulates closing it by momentarily turning the control switch to the CLOSE position **EXAMINER'S CUE: After operator simulates turning the control switch for breaker 52/32/B to the CLOSE position, inform him/her ______________** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 9: Check VOLTMETER BUS DS - APPROXIMATELY 480 VOLTS (Step 3.f) STANDARD: Operator locates the VOLTMETER BUS DS and determines it indicates 480 volts **EXAMINER'S CUE: After operator locates the VOLTMETER BUS DS inform him/her it indicates 480 volts** COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant has lost onsite and offsite AC power
EPP-1 (Loss of All AC Power) has been implemented
EPP-1 has directed entry into EPP-22 to energize plant equipment using the DSDG
All equipment in Step 1 of EPP-22 has been obtained from the Control Room

INITIATING CUES:

The CRSS has directed you to perform the steps of EPP-22 necessary to energize the DS Bus.

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM IP-039

PERFORM AOP-022, ATTACHMENT 7, ISOLATION OF SOUTH SW HEADER IN THE AUXILIARY BUILDING

CANDIDATE ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform AOP-022, Attachment 7, Isolation of South SW Header in the Auxiliary Building.
000 076 R1 04
000 127 R5 01
000 111 R5 01

Alternate Path:

N/A

Facility JPM #:

JPM IP-039

K/A Rating(s):

076 K4.06	2.8/3.2
062 AK3.03	4.0/4.2
062 AA2.01	2.9/3.5
062 AA2.03	2.6/2.9

Task Standard:

Intact service water header isolated from ruptured header, leak isolated and cooling water lined up to critical loads.

Preferred Evaluation Location:

Simulator _____ In-Plant __X__

Preferred Evaluation Method:

Perform _____ Simulate __X__

References:

AOP-022, Attachment 7

Validation Time: 20 min. **Time Critical:** No

Candidate: ______________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT _____ UNSAT _____

Performance Time: ________

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

COMMENTS

Step 1
Critical because either SW-18 or SW-19 must be closed to isolate ruptured header from intact header.

Step 2
Critical because SW-739 and SW-100 must be closed to isolate ruptured header from intact header.

Step 4
Critical because Air Compressors must be OFF to prevent damage due to having no cooling water.

Step 5
Critical because wrong assessment of leak location would result in cooling water not being supplied to vital equipment.

Step 6
Critical because SW-52 must be closed to prevent reinitiating the leak and SW-83 must be opened to supply cooling water to vital equipment.

Step 8
Critical because wrong assessment of leak location would result in cooling water not being supplied to vital equipment.

Step 9
Critical because SW-24 must be closed to prevent reinitiating the leak and SW-26 and SW-27 must be opened to supply cooling water to vital equipment.

Tools/Equipment/Procedures Needed:

AOP-022, Attachment 7

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Candidate Cue Sheet I provided you.

INITIAL CONDITIONS:

1. The plant is at 100% power.
2. You are the inside auxiliary operator
3. The control room has implemented AOP-022 (Loss of Service Water) for a leak in the South Header.
4. The leak is on the downstream flange of SW-545, South Service Water Header Check Valve.

INITIATING CUES:

The CRSS has directed you to perform Attachment 7 of AOP-022, for components located inside the Auxiliary Building.

START TIME: ________

STEP 1: Close One Of The Following Valves In The Auxiliary Building Hallway (Step 1) • SW-18, NORTH AND SOUTH SUPPLY HDR CROSS CONNECT OR • SW-19, NORTH AND SOUTH SUPPLY HDR CROSS CONNECT STANDARD: Operator simulates closing either SW-18 or SW-19 by pulling the chain operator to rotate valve handwheel in the CW direction. **EXAMINER'S CUE:** **Valve indicates closed.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE: SW-100 is located above CCW HX A on the East side

STEP 2: Close The Following Valves In The CCW Pump Room: (Step 2) • SW-739, CCW HEAT EXCHANGER "A" RETURN • SW-100, HVH-7A SUPPLY STANDARD: Operator simulates closing • SW-739 by turning the valve handwheel in the fully clockwise direction and observing the valve position indicator point to closed • SW-100 by turning the valve handwheel in the fully clockwise direction and observing the stem fully inserted **EXAMINER'S CUE:** **When Operator enters CCW Pump Room, inform him water is on the floor.** **When Operator approaches SW-739, inform him water is spraying from the downstream flange for the south SW header check valve.** **SW-739 indicator points to CLOSED and SW-100 valve stem is inserted.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: Notify Control Room Personnel That Steps 1 And 2 Of Attachment 7 Are Complete (Step 3) STANDARD: Control Room notified Steps 1 and 2 are complete. **EXAMINER'S CUE: Acknowledge Control Room notified.** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Place Control Switches For The Following Equipment In The OFF Position: (Step 4) • STATION AIR COMPRESSOR • INSTRUMENT AIR COMPRESSOR A STANDARD: Operator simulates placing the control switches for the Station Air Compressor and Instrument Air Compressor "A" in OFF position **EXAMINER'S CUE: Station Air Compressor and Instrument Air Compressor A are in the OFF position.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

CAUTION: Subsequent actions to cross-connect cooling water to plant components should not be performed if the leak will be reinitiated

NOTE: SW-52, SOUTH SUPPLY HDR TO "A" TRN COMPONENTS IN AUX BLDG, is located in the Auxiliary Building hallway, East of the STATION AIR RECEIVER, above third cable tray

STEP 5: Check leak location - UPSTREAM OF SW-52 (Step 5) STANDARD: Operator determines leak is upstream of SW-52 **EXAMINER'S NOTE: The operator may decide to refer to the P&IDs to verify leak location.** **DWG. # G-190199 sheet 10 (B3): SW-545 (leak is on the downstream flange of this check valve). Follow to sheet 9 (B1) and farther downstream to (C7) to find SW-52** **EXAMINER'S CUE: If asked, there is no water in the Aux Bldg hallway** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE:
- SW-83, DIESEL SUPPLY CROSS-CONNECT, is located at the North end of EDG A.
- Cross-connecting Service Water to the Emergency Diesel Generators will also cross-connect Service Water to INSTRUMENT AIR COMPRESSOR A, STATION AIR COMPRESSOR, HVH-6A,and HVH-8A
- A ladder is required for access to SW-52.

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STEP 6: Cross-Connect Service Water Supply To EDGs As Follows: (Step 6)
a. Close SW-52
b. Open SW-83

STANDARD: Operator simulates:
a. closing SW-52 by obtaining (or stating the location of) a ladder, and turning the valve handwheel in the fully clockwise direction
b. opening SW-83 by turning the valve handwheel in the fully counter-clockwise direction and observing the stem fully withdrawn

EXAMINER'S NOTE: Potential follow-up questions if these actions are not demonstrated:
• **requirements for wearing a safety harness**
• **requirements for informing HP regarding climbing in the overhead**

EXAMINER'S CUE: After Operator locates SW-52, states where a ladder would be obtained and simulates closing SW-52, inform him the valve is closed.

After Operator locates SW-83 and simulates opening SW-83, inform him the valve is open.

COMMENTS:

</td><td>

CRITICAL STEP

___ SAT

___ UNSAT

</td></tr>
<tr><td>

STEP 7: Notify Control Room Personnel That SW Has Been Cross-Connected To Supply The Following Equipment: (Step 7)
• EDG A
• INSTRUMENT AIR COMPRESSOR A
• STATION AIR COMPRESSOR
• HVH-6A
• HVH-8A

STANDARD: Operator notifies the Control Room that SW has been Cross-Connected

EXAMINER'S CUE: Acknowledge report from the Operator to the Control Room.

COMMENTS:

</td><td>

___ SAT

___ UNSAT

</td></tr>
</table>

STEP 8: Check Leak location - UPSTREAM OF SW-24, SOUTH HDR SUPPLY TO SW BOOSTER PUMPS (Step 8) STANDARD: Operator determines the leak is upstream of SW-24 **EXAMINER'S CUE: If asked, there is no water in Aux Bldg hallway or "A" EDG room.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE: SW BOOSTER PUMP A may be operated as required after the suction path is established from the North Service Water Header.

STEP 9: Cross-Connect SW Booster Pump Suction Supply As Follows: (Step 9) a. Close SW-24 b. Open SW-26 SW BOOSTER PUMP SUCTION CROSS-CONNECT c. Open SW-27 SW BOOSTER PUMP SUCTION CROSS-CONNECT STANDARD: Operator simulates a. closing SW-24 by turning the valve handwheel in the fully clockwise direction and observing the valve position indicator pointing to the closed position b. opening SW-26 by turning the valve handwheel in the fully counter-clockwise and observing the valve position indicator pointing to the open position c. opening SW-27 by turning the valve handwheel in the fully counter-clockwise and observing the valve position indicator pointing to the open position **EXAMINER'S CUE: After the operator locates and simulates:** **a. closing SW-24, inform him/her the position indicator indicates closed** **b. opening SW-26, inform him/her the position indicator indicates open** **c. opening SW-27, inform him/her the position indicator indicates open** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 10: Notify Control Room Personnel That SW Has Been Cross-Connected To Supply SW BOOSTER PUMP A (Step 10) STANDARD: Operator notifies the Control Room that SW has been cross-connected to supply SW Booster pump A **EXAMINER'S CUE: Acknowledge the report from the Operator.** COMMENTS:	___ SAT ___ UNSAT
STEP 11: Notify Control Room Personnel That Attachment 7 Is Complete (Step 11) STANDARD: Operator notifies the Control Room that Attachment 7 is complete **EXAMINER'S CUE: Acknowledge the report from the Operator** COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME: _____

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is at 100% power.

You are the inside auxiliary operator

The control room has implemented AOP-022 (Loss of Service Water) for a leak in the South Header

The leak is on the downstream flange of SW-545, South Service Water Header Check Valve

INITIATING CUES:

The CRSS has directed you to perform Attachment 7 of AOP-022, for components located inside the Auxiliary Building

REGION II
LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM IP-048

RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL IAW EPP-1

OPERATOR ______________________________

EXAMINER ______________________________

Approved By: ______________________ Date: ______________

REGION II
JOB PERFORMANCE MEASURE

Task:

Restore AC Power At The EDG Engine Control Panel IAW EPP-1, Attachment 6
000*055*R5*01

Alternate Path:

"A" EDG unavailable, cannot be started
"B" EDG will not start from local control panel
Breaker 52/27B failed to automatically close

Facility JPM #:

JPM IP-048
AO / RO / SRO

K/A Rating(s):

064 A4.01	4.0/4.3
064 A4.06	3.9/3.9
055 EA1.02	4.3/4.4
055 EA1.06	4.1/4.5

Task Standard:

E-2 energized from "B" Emergency Diesel Generator IAW EPP-1 Attachment 6, RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL.

Preferred Evaluation Location:

Simulator ______ In-Plant __X__

Preferred Evaluation Method:

Perform ______ Simulate __X__

References:

EPP-1, Attachment 6, RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL

Validation Time: 18 min. **Time Critical:** Yes (12 min.)

Operator: ______________________________
NAME

	Overall Time	**Critical Time**
Start:	__________	__________
Finish:	__________	__________
Performance Time (min):	__________	__________

Performance Rating: SAT ________ UNSAT ________

Examiner: ______________________ ______________________ / ________
NAME SIGNATURE DATE

COMMENTS

Steps 1 - 13
Time critical because restoration of power to at least 1 safety-related bus is required in a timely manner to prevent RCP Seal degradation

Step 1
Critical because control must be transferred to local to enable start pushbutton

Step 2
Critical because operator action is required to locally start the EDG

Step 6
Critical because de-energizing the air start solenoids causes the diesel engine to start

Step 7
Critical because operator action is required to manually isolate Starting Air to the EDG (ensures EDG can carry full load)

Step 11
Critical because transition to the RNO is based on recognizing the "B" EDG output breaker is open

Step 12
Critical because the synchroscope switch is interlocked with the local close switch for 52/27B

Step 13
Critical because operator action is required to manually close the EDG "B" output breaker to supply the E-2 Bus.

Tools/Equipment/Procedures Needed:

EPP-1, Attachment 6, RESTORING AC POWER AT THE EDG ENGINE CONTROL PANEL

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps , including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the Operator Cue Sheet I provided you.

OPERATOR INFORMATION:

Inform the operator that there are time critical steps in this JPM.

INITIAL CONDITIONS:

You are the Inside Auxiliary Operator.

The Unit has experienced a total loss of onsite and offsite AC power.

EOP procedure EPP-1 (Loss of AC Power) has been implemented.

"A" Emergency Diesel Generator is out of service and under clearance.

"B" Emergency Diesel Generator failed to automatically start.

INITIATING CUES:

In accordance with EPP-1, Step 7, the Control Room Shift Supervisor (CRSS) has directed you to place the "B" EDG Control Switch in the LOCAL position, depress the START pushbutton, and report back as soon as possible.

START TIME: ________ **TIME CRITICAL START TIME:** ________

EVALUATOR NOTE:
Steps 1 through 13 are time critical.
Record the CRITICAL START TIME as time the operator enters the "B" EDG Room.

EPP-1 STEP 1: Place the EDG Control Switch in the LOCAL position (Step 7.b.1 RNO) STANDARD: Operator simulates placing the EDG Control Switch in the LOCAL position and observes the LOCAL CONTROL white light. **EXAMINER'S CUE: The EDG Control Switch is in the LOCAL position. The LOCAL CONTROL white light is illuminated.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Depress the START pushbutton (Step 7.b.2 RNO) STANDARD: Operator simulates depressing the START pushbutton. **EXAMINER'S CUE: When the START pushbutton is depressed, inform the Operator that the EDG is NOT rolling over.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Operator contacts the CRSS to inform him B EDG did not start. STANDARD: Operator determines B EDG did not start and "A" EDG is OOS from initial conditions. Operator contacts the CRSS to inform him B EDG did not start. **EXAMINER'S NOTE: PA is not energized. If Operator uses PA, provide no response. Radio or cell phone are functional.** **EXAMINER'S CUE: Acknowledge report from Operator and instruct him to perform EPP-1, Attachment 6.** COMMENTS:	___ SAT ___ UNSAT

STEP 4: Operator determines need to obtain a copy of EPP-1, Attachment 6. STANDARD: Operator obtains a copy of EPP-1, Attachment 6 from IAO office, WCC, Control Room, or other valid location. **EXAMINER'S NOTE: None.** **EXAMINER'S CUE: When Operator states need to obtain a copy of EPP-1, Attachment 6, ask where he would locate one. If correct, provide copy of EPP-1, Attachment 6.** COMMENTS:	___ SAT ___ UNSAT
EPP-1, Attachment 6 STEP 5: Check EDGs Status - AT LEAST ONE RUNNING. (Step 1) STANDARD: Operator determines "B" EDG did not start by checking local indications and "A" EDG is OOS from initial conditions. Operator proceeds to Step 1, RNO. **EXAMINER'S CUE: Provide the operator cues for the indications that he (she) would check to determine that "B" EDG is NOT running. For example:** **Room is quiet** **Engine not rotating** **Normal lighting de-energized, only emergency lights are illuminated** COMMENTS:	___ SAT ___ UNSAT

STEP 6: Contact the Control Room and request that the following breakers be opened in the Battery Room: (Step 1 RNO) • At 125V DC MCC-A, open Breaker 24, DIESEL GENERATOR "A" CONTROL POWER. • At 125V DC MCC-B, open Breaker 12, DIESEL GENERATOR "B" CONTROL POWER STANDARD: Operator contacts the Control Room to have the following breakers opened in the Battery Room: • At 125V DC MCC-B, open Breaker 12, DIESEL GENERATOR "B" CONTROL POWER. **EXAMINER'S NOTE: Operator may elect to only have breaker associated with B EDG opened since A EDG is under clearance.** **EXAMINER'S CUE: Control Room acknowledges MCC B / Breaker 12 and, if requested, MCC A / Breaker 24 need to be opened.** **(~ 1 minute later) the "B" EDG STARTS (air solenoids fail open).** **Noise level in the room increases** **Control Room reports the requested breakers (above) have been opened** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Unlock And Close Both DG STARTING SOLENOID INLET Valves For Any Running EDG: (Step 2nd bullet) • For EDG B: DA-18B DA-22B STANDARD: Operator simulates unlocking and closing DA-18B and DA-22B by rotating the handwheel in the fully clockwise direction **EXAMINER'S NOTE: "A" EDG starting air valves are closed and under clearance.** **EXAMINER'S CUE: When valves are located and simulated unlocked and closed then inform operator the valves are rotated fully clockwise.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

<u>STEP 8</u>: Close The Output Breaker For EDG "A" As Follows: (Step 3.a) a. Check EDG "A" - RUNNING. <u>STANDARD</u>: Operator determines "A" EDG is not running and proceeds to Step 4 (via the RNO) **EXAMINER'S CUE: If the operator goes into the "A" EDG Room, inform him/her it is very quiet and except for the emergency lights, dark in the room** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 9</u>: Close The Output Breaker For EDG "B" As Follows (Step 4.a) a. Check EDG "B" - RUNNING <u>STANDARD</u>: Operator determines "B" EDG is running. **EXAMINER'S CUE: "B" EDG is running,** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 10</u>: At the DG CONTR. SW BRD. B, check GENERATOR VOLTAGE - APPROXIMATELY 480 VOLTS (Step 4.b) <u>STANDARD</u>: Operator determines "B" EDG Output Voltage is Approximately 480V. **EXAMINER'S CUE: When Operator locates EDG Output Voltage Meter inform him voltage is 480V.** <u>COMMENTS</u>:	___ SAT ___ UNSAT
<u>STEP 11</u>: At the DG CONTR. SW BRD. B, Check EDG OUTPUT BKR 52/27B - CLOSED (Step 4.c) <u>STANDARD</u>: Operator determines breaker 52/27B is not closed and proceeds to step 4.c RNO **EXAMINER'S CUE: Green Light is illuminated and red light extinguished for breaker 52/27B.** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT

<u>STEP 12</u>: Turn the SYNCHROSCOPE Switch for the GENERATOR Breaker to the ON position (Step 4.c.1 RNO) <u>STANDARD</u>: Operator positions Generator Synchroscope switch to the ON position. **EXAMINER'S CUE: The SYNCHROSCOPE Switch for the GENERATOR Breaker is in the ON position. If asked, the synchroscope pointer is at 12:00 and the lights are extinguished.** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT
<u>STEP 13</u>: Close EDG OUTPUT BKR 52/27B. (Step 4.c.2 RNO) <u>STANDARD</u>: Operator simulates momentarily placing the control switch for breaker 52/27B to the close position and determines the breaker closed by observing the red light illuminated, and the green light extinguished **EXAMINER'S NOTE: If operator did not turn on synchroscope, or manipulated the wrong synchroscope, then 52/27B DID NOT Close. DO NOT provide cue below.** **EXAMINER'S CUE: When proper switch is located and operation is simulated, notify Operator that breaker 52/27B red light is illuminated, and green light is extinguished.** <u>COMMENTS</u>:	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME CRITICAL STOP TIME: ________

<u>STEP 14</u>: <u>IF</u> breaker 52/27B will <u>NOT</u> close, <u>THEN</u> Trip EDG "B" (Step 4.c.3 RNO) <u>STANDARD</u>: Operator determines breaker 52/27B is closed by observing the red light illuminated, green light extinguished **EXAMINER'S CUE: None** <u>COMMENTS</u>:	___ SAT ___ UNSAT

STEP 15: Turn the SYNCHROSCOPE Switch for the GENERATOR Breaker to the OFF position (Step 4.c.4 RNO) STANDARD: Operator simulates placing the SYNCHROSCOPE Switch for the GENERATOR Breaker to the OFF position. **EXAMINER'S CUE: The SYNCHROSCOPE Switch for the GENERATOR Breaker to the OFF position.** COMMENTS:	___ SAT ___ UNSAT
STEP 16: Check BOTH EDG Starting Air Receivers - GREATER Than 80 PSIG (Step 5) STANDARD: Operator determines "B" EDG Air Receiver is pressurized to > 80 psig by observing the pressure indicator at the top of the receiver **EXAMINER'S NOTE: Since "A" EDG is OOS, the operator may not check its Air Receiver** **EXAMINER'S CUE: When Operator checks Air Receiver pressure gauge(s) inform him air pressure is 100 psig.** COMMENTS:	___ SAT ___ UNSAT
STEP 17: Perform The Following: (Step 6) a. Notify Control Room that Attachment 6 is complete b. Inform Control Room of EDG AND EDG output breaker status STANDARD: Operator simulates notifying the Control Room that Attachment 6 is complete and "B" EDG is running with it's Output Breaker shut **EXAMINER'S CUE: When Control Room is contacted acknowledge report.** COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME: ________

OPERATOR CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are the Inside Auxiliary Operator.

The Unit has experienced a total loss of onsite and offsite AC power.

EOP procedure EPP-1 (Loss of AC Power) has been implemented.

"A" Emergency Diesel Generator is out of service and under clearance.

"B" Emergency Diesel Generator failed to automatically start.

INITIATING CUES:

In accordance with EPP-1, Step 7, the Control Room Shift Supervisor (CRSS) has directed you to place the "B" EDG Control Switch in the LOCAL position, depress the START pushbutton, and report back as soon as possible.