U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit: Sequoyah Nuclear Plants 1 & 2
Region: I ☐ II X III ☐ IV ☐	Reactor Type: W X CE ☐ BW ☐ GE ☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

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:

   - Unit 2 was operating at 100% power when the following indications were observed:
     - PZR pressure at 2100 psig and rapidly decreasing
     - Tavg 578°F and stable
     - PZR level 65% and rising

   - 30 secs later the Reactor was manually tripped by the operator and the following indications were noted upon completing the immediate operator actions:
     - PZR pressure 1800 psig and decreasing
     - RCS temp 547°F and slowly lowering
     - PZR level 75% and rapidly rising

   Which ONE of the following accidents would provide these indications?

   A. Ejected Control Rod

   B. PZR Vapor Space Break

   C. SBLOCA on the RCS Cold-leg

   D. Feedline Break Inside Containment

2. Given the following conditions:

   - A large break LOCA occurred
   - Operators have just completed transfer to containment sump
   - A loss of offsite power occurs

   In accordance with ES-1.3, "Transfer to RHR Containment Sump," which one of the following describes the operator actions required for this condition?

   A. Place the SI pumps and CCPs in Pull-to-Lock until the RHR pumps have been restarted after the shutdown boards are reenergized.

   B. Place the CCPs in Pull-to-Lock until the RHR pumps have been restarted after the shutdown boards are reenergized.

   C. Ensure both RHR pumps are started by the blackout sequencers after the diesel generators reenergize the shutdown boards, then restart the SI pumps.

   D. Ensure ALL ECCS pumps are started by the blackout sequencers when the diesel generators reenergize the shutdown boards.

3. Given the following:

- Unit-1 is operating at 100% power
- The CVCS system in normal alignment and 1B CCP in service.
- The following indications occur concurrently:

- All RCP seal flows decreasing
- Annunciator windows :
  - FS-62-1 REAC COOL PMPS SEAL WATER FLOW LO
  - FS-62-93 A/B CHARGING LINE FLOW ABNORMAL
- 1-FI-62-93A "CHARGING HDR FLOW" decreases from 84 gpm to 52 gpm
- 1-PI-62-92A "CHARGING HDR PRESS" decreases from 2400 psig to 2100 psig
- 1-EI-62-104A "CHARGING PUMP 1B AMPS" increases from 32 to 46 amps
- Demand is slowly increasing on 1-HIC-62-93 "CHARGING FLOW CONTROL"

In accordance with AOP-M.09,"Loss of Charging," which ONE of the following is the required crew response?

A. Stop 1B CCP and place 1A CCP in service.

B. Stop and place the 1B CCP in Pull-to-Lock and monitor RCP seal temperatures.

C. Dispatch auxiliary building AUO to swap in service seal injection filters.

D. Take manual control of charging flow control 1-HIC-62-93A and adjust 1-HIC-62-93A and charging seal water flow control 1-HIC-62-89A to increase seal water flows.

4. Given the following:

   - Unit 1 is in Mode 5 with RCS at Mid-Loop.
   - 1A-A RHR pump in service.

   In accordance with AOP-R.03, "RHR System Malfunction," which ONE of the following action(s) will be required if the 1A-A RHR pump motor amps become very erratic and continue to be erratic even after flow is reduced?

   A. Stop the 1A-A RHR pump and start the 1B-B RHR pump.

   B. Make up to the RCS immediately by opening valve 1-FCV-63-1, RHR suction from RWST.

   C. Stop the 1A-A RHR pump, increase the level in the RCS and attempt to restore RHR cooling.

   D. Make up to the RCS immediately via valves 1-FCV-62-135 & 136, Suction of CCPs from the RWST.

5. Given the following:

- Unit-1 is in Mode 4 aligned for two train RHR cooldown in preparation for refueling.
- Unit-2 is in Mode 1 at 100% power.
- The ERCW cooling valves to CCS heat exchangers are aligned as follows:
- 1-HS-67-146A, "CCS HX 1A1 and 1A2 to Disch Hdr B," is in the "open position."
- 0-HS-67-152A, "CCS HX 0B1 and 0B2 Outlet to Disch Hdr B," is in the "open position," pushed in.
- 2-HS-67-146A, "CCS HX 2A1 and 2A2 to Disch Hdr A," is in the "35% open position."

Which ONE of the following identifies the automatic equipment response to a U-2 Safety Injection signal and the reason.

A. 1-FCV-67-146 repositions to 35% open to ensure adequate flow to the 2A1 and 2A2 CCS heat exchangers.

B. 0-FCV-67-152 repositions to 50% open to ensure adequate flow to "B" train ESF components.

C. 2-FCV-67-146 repositions to 50% open to ensure adequate flow to the 2A1 and 2A2 CCS heat exchangers.

D. 0-FCV-67-152 repositions to 35% open to ensure adequate flow to "B" train ESF components.

6. With both units operating at 100% power a loss of offsite power occurred. Unit-1 shutdown boards were energized two minutes ago from their respective diesel generators.

   Assuming **NO** operator action, which ONE of the following identifies the banks of pressurizer heaters (A, B, C or D,) if any, that are available for pressurizer pressure control at this time?

   A. All heaters are available.

   B. No heaters are available.

   C. A and B, only.

   D. C and D, only.

7. Given the following:

   - An ATWS has occurred and FR-S.1, "Response to Nuclear Power Generation/ATWS," is in progress.
   - While implementing step #2 "**VERIFY** turbine TRIPPED," an SI occurs (caused by a Pressurizer PORV OPENING) and all rods insert.

   Which ONE of the following actions is required be performed?

   A. Immediately exit FR-S.1, and Perform E-0, "Reactor Trip or Safety Injection."

   B. Shut the block valve for the stuck open PORV then transition to E-0 at step 6, "**MONITOR** for SI Signal," of FR-S.1.

   C. Remain in FR-S.1 until completed or directed to transition to another procedure.

   D. Exit FR-S.1 when the RED path clears, and perform the steps of E-1, "Loss of Reactor or Secondary Coolant," then close the block valve to the stuck open PORV.

8. Given the following:

- Unit-2 is in Mode 3 at normal operating temperature and pressure with the main steam isolation valves closed.
- The crew is responding to a manual Safety Injection due to decreasing Pressurizer level.
- While performing actions of E-0, "Reactor Trip or Safety Injection," the crew is at step 21, "Verify Secondary Radiation Normal."

Which ONE of the following identifies how the operator ensures a S/G blowdown sample path exists for identification of the ruptured steam generator?

A. Ensure all aux FW start signals are clear. Verify the red sample valve status light is lit for the S/G to be sampled on 2-M-6.

B. Ensure all aux FW start signals are clear. Ensure inside containment blowdown isolation valve for the S/G to be sampled, red light, is lit on 2-M-4.

C. Ensure phase "A" is reset. Verify the red sample valve status light is lit for the S/G to be sampled on 2-M-6.

D. Ensure phase "A" is reset. Ensure inside containment blowdown isolation valve for the S/G to be sampled, red light, is lit on 2-M-4.

9. The following conditions exist on Unit-1:

- Reactor power is 55%
- Purge is in service for a containment entry
- A feedwater line rupture occurs outside containment

Loop # 3 steam generator narrow range level channels decrease as tabulated below:

TIME	1-LI-3-97	1-LI-3-94	1-LI-3-93
0 minutes	15%	14%	14%
2 minutes	13%	12%	12%
4 minutes	11%	10%	10%
6 minutes	10%	8%	9%

Assuming **NO** operator action, which one of the following identifies the earliest time annunciator panel 1-M4-D window (A-3) "LS-3-97B STM GEN LOOP 3 LEVEL LOW-LOW REACTOR TRIP" will light.

A. 0 minutes

B. 2 minutes

C. 4 minutes

D. 6 minutes

10. Given the following:

- Unit 2 has tripped due to a loss of off-site power.
- Natural circulation flow has been established.
- The present plant conditions are:
  - PZR level 33% and lowering.
  - All SG pressures are ~1000 psig.
  - RCS subcooling is 87°F.

Which ONE of the following indicate the RCS loop wide range cold leg temperatures?

A. 532 - 536°F

B. 538 - 542°F

C. 544 - 548°F

D. 550 - 554°F

11. Given the following:

- Unit 1 is at 100% RTP.
- MCR alarms received indicate that an electrical board has failed.
- All trip status lights on Panel 1-XX-55-5 (1-M-5) are OFF .
- The crew responds in accordance with the appropriate procedure.

Which ONE of the following identifies...

(1) the electrical board that failed

and

(2) the reason that manipulation of Auxiliary Feedwater (AFW) controls will be required?

	(1)	(2)
A.	120 VAC Vital Instrument Board 1-I.	To prevent overcooling due to excessive AFW flow due to the LCVs failing open.
B.	120 VAC Vital Instrument Board 1-I.	To allow the turbine driven AFW pump to be operated above minimum speed.
C.	120 VAC Vital Instrument Board 1-II.	To prevent overcooling due to excessive AFW flow due to the LCVs failing open.
D.	120 VAC Vital Instrument Board 1-II.	To allow the turbine driven AFW pump to be operated above minimum speed.

12. Given the following plant conditions:

- Units 1 and 2 are operating at 100% power.
- The 125 V DC Power System is normally aligned except Vital Battery Board IV, which is being supplied from the Vital Battery V and 2-S Vital Battery Charger.
- Offsite power is lost.
- 1A-A and 2B-B diesel generators start and load.
- 1B-B and 2A-A diesel generators fail to start.

Assuming **NO** operator action is taken, if offsite power has been lost for 5 hours, which ONE of the following statements identifies the condition of the 125V Vital DC battery boards?

A. All four 125v Vital DC Battery Boards would be at their normal voltage.

B. All four 125v Vital DC Battery Boards would be at lower than normal voltage.

C. 125v Vital DC Battery Boards I and IV would be at their normal voltage.

125v Vital DC Battery Boards II and III would be at lower than normal voltage.

D. 125v Vital DC Battery Boards II and III would be at their normal voltage.

125v Vital DC Battery Boards I and IV would be at lower than normal voltage.

13. Given the following plant conditions:

- A Safety Injection has occurred on Unit 1.
- D/G 1A-A and 1B-B are running.
- ERCW pump L-B is not running and M-B failed to automatically start.
- All other equipment functioned as designed.

Assuming **NO** operator action, which ONE of the following describes the effect this failure will have on 1B-B D/G?

A. If ERCW pump L-B or M-B is not started, 1B-B D/G will automatically trip on high Jacket Water temperature.

B. 1B-B D/G will be unaffected since the ERCW Headers 1B and 2B are crosstied.

C. 1B-B D/G will be unaffected since the ERCW Headers 1A and 1B are crosstied.

D. If ERCW pump L-B or M-B is not started, 1B-B D/G will experience high Main Bearing temperatures.

14. Given the following conditions:

- Unit-1 is at 100% power.
- All systems normally aligned.
- The Transmission Operator has notified the plant that system grid voltage is high and forecasted to go higher.
- The Transmission Operator requests the plant to take in the maximum value of MVARs to help stabilize the grid.

Which ONE of the following transmission lines out of service affects the maximum allowed MVAR incoming value on Unit 1, and how is the adjustment made in accordance with 0-GO-5, "Normal Power Operation?"

	TRANSMISSION LINE	METHOD OF ADJUSTMENT
A.	A 500 KV line	Exciter Voltage Auto Adjuster
B.	A 161 KV line	Exciter Voltage Base Adjuster
C.	A 161 KV line	Exciter Voltage Auto Adjuster
D.	A 500 KV line	Exciter Voltage Base Adjuster

15. Given the following:

- Unit 1 was operating at 100% power when a small break LOCA occurred.
- The crew has implemented ECA-1.2, "LOCA Outside Containment," due to alarm "AUX BLDG HIGH ENERGY LINE BREAK" being LIT.
- The crew closes RHR Train A cold leg injection valve, FCV-63-93, in accordance with ECA-1.2.
- RCS pressure is now 1495 psig and slowly rising.

Which ONE of the following pumps is contributing the most to the decrease in RWST level?

A. 1B-B Safety Injection pump

B. 1A-A Containment Spray pump

C. 1B-B RHR pump

D. 1A-A CCP injecting through CCPIT

16. In accordance with EPM-3-FR-H.1, "Basis Document For FR-H.1 Loss Of Secondary Heat Sink," which ONE of the following is the reason the RCPs are tripped during performance of FR-H.1, "Response to Loss of Secondary Heat Sink"?

    A. To extend the effectiveness of the remaining water inventory in the steam generators.

    B. To delay the pressure rise to the PORV setpoint by lowering core delta P.

    C. To allow natural circulation to be established prior to losing the steam generators as a heat sink.

    D. To prevent excessive inventory loss through open PORVs if bleed and feed is necessary.

17. Given the following conditions:

- With Unit 1 initally at full power a large break LOCA occurred.
- Containment pressure = 11 psig.
- Both Containment Spray Pumps are running.
- Containment sump level = 52%.
- RWST level = 26%.
- The crew transitioned to ECA-1.1, "Loss Of RHR Sump Recirculation," due to the inability to open either of the Containment Sump suction valves,
  1-FCV-63-72, "CNTMT Sump Suct to RHR Pump 1A,"
  or
  1-FCV-63-73, "CNTMT Sump Suct to RHR Pump 1B."
- The crew is determining the proper containment spray pump alignment and operation.

In accordance with ECA-1.1, which ONE of the following will result in the proper alignment of the containment spray pumps under existing plant conditions?

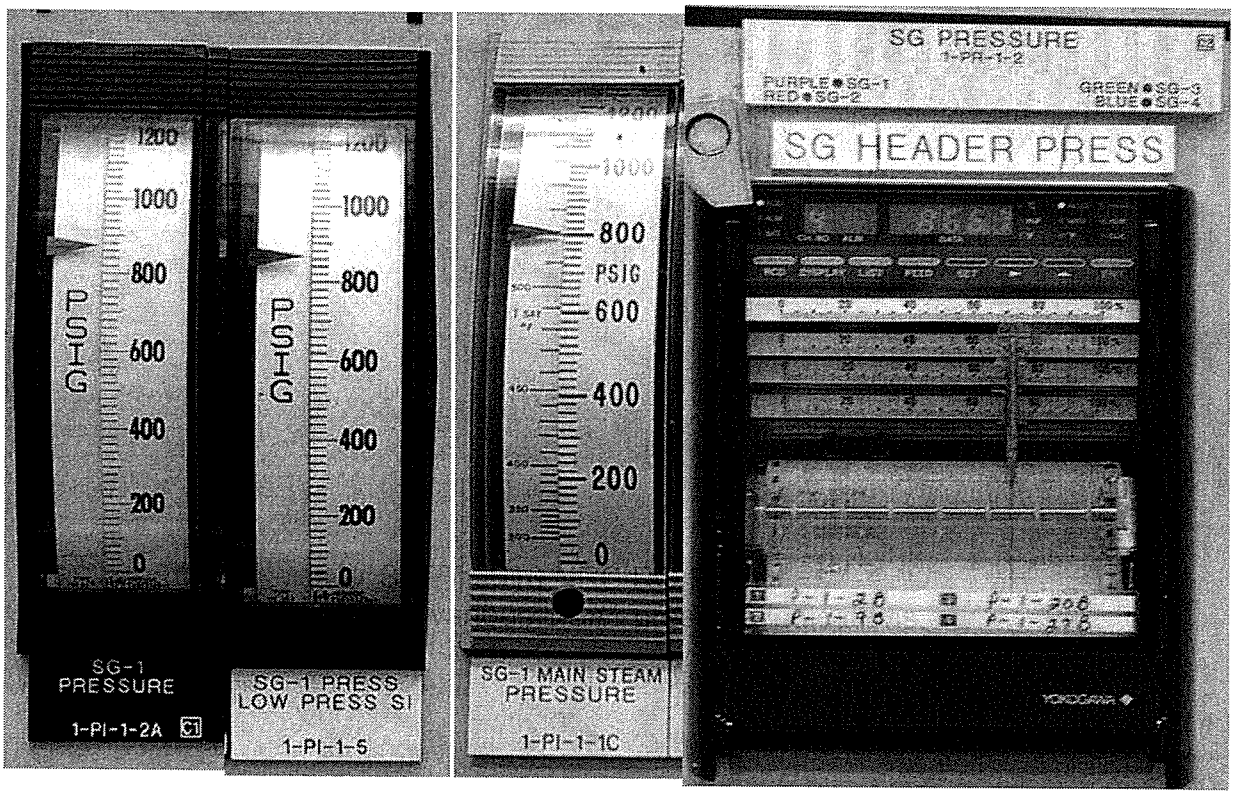
A. Stop both containment spray pumps and place the handswitches in PULL TO LOCK.

B. Continue to run both containment spray pumps until RWST level is less than 8%, then stop both containment spray pumps.

C. Stop one containment spray pump and allow the remaining containment spray pump to take suction from the RWST.

D. Stop both containment spray pumps until suction can be aligned to the containment sump, then restart one containment spray pump.

18. Given the following picture of various SG#1 pressure indications:



Which ONE of the pictured indicators is the Post Accident Monitoring (PAM), Category 1, indication that would be used to indentify/indicate a Steam Line Break on SG#1?

A. 1-PI-1-2A
B. 1-PI-1-5
C. 1-PI-1-1C
D. 1-PR-1-2

19. Plant conditions are as follows:

- Unit 2 is at 100% steady state power.
- The Pressurizer Level Control Selector Switch, 2-XS-66-339E, is selected to LT-339/320.

Assuming **NO** operator action, which ONE of the following describes the response(s) of the pressurizer level control system if the bellows inside the differential pressure cell for pressurizer level transmitter 2-LT-68-320 develops a leak?

A. Backup heaters energize and annunciator "LS-68-339E/F PRESSURIZER LEVEL HIGH BACKUP HTRS ON," alarms.

B. Letdown isolates, pressurizer heaters deenergize and annunciator "LS-68-339E/F PRZR LVL LOW HEATER OFF & LETDOWN SECURED," alarms.

C. Charging flow increases and annunciator "LS-68-335D/E PRESSURIZER LEVEL HIGH-LOW," alarms.

D. Charging flow remains constant and annunciator "LS-68-335D/E PRESSURIZER LEVEL HIGH-LOW," alarms

20. Given the following:

- Unit 2 is at 100% power with N31,"Source Range Channel I," out of service for maintenance.
- A loss of all AC power has occurred on Unit 2.
- The actions required by ECA-0.0, "Loss of All AC Power," are in progress.
- SG atmospheric relief valves are being controlled locally to reduce SG pressure to less than 160 psig.
- A low steam line pressure SI signal has been received.
- Steam line pressure is 350 psig and RCS cold leg temperatures are 325 °F.
- The OATC reports that N32, "Source Range Channel II," startup rate indicated positive then dropped to zero.
- The STA monitoring the CSF status trees informs the shift supervisor that there is an Orange path on Subcriticality.
- Both Intermediate range startup rates are reading a sustained +0.2 dpm.

In accordance with ECA-0.0, which ONE of the following actions is required to be taken and the reason for this action?

A. Begin an emergency boration to add negative reactivity.

B. Stop dumping steam and allow the plant to heat up to add negative reactivity.

C. Continue to lower SG pressure to < 160 psig to inject the Cold Leg Accumulators thus adding negative reactivity.

D. Proceed immediately to FR-S.1,"Nuclear Power Generation/ATWS," due to Orange path on Critical Safety Function Status Trees.

21. Which ONE of the following failures of the Intermediate Range Nuclear Instrumentation system would require Duty Plant Manager notification for actuation of the reactor protection system?

A. With Reactor power at 20%, control power fails on both intermediate channels.

B. With Reactor power at 98%, Intermediate range channel N-35 fails high with N-36 previously removed from service.

C. Power is decreased from 12% to 8% following completion of actions for removing N-36 from service due to loss of control power.

D. Power is decreased from 12% to 8% following completion of actions for removing N-36 from service due to loss of instrument power.

22. The following plant conditions exist:

- Refueling is in progress on Unit 1.
- A spent fuel element is being moved from the reactor to the upender.
- The spent fuel element is dropped to the bottom of the canal.

Which ONE of the following products released from the ruptured spent fuel element will present the most immediate hazard?

A. Beta radiation from Tritium.

B. Alpha radiation from fission products.

C. Gamma radiation from Iodine and Krypton gases.

D. Gamma radiation from fission and corrosion products.

23. Given the following:

- Unit 1 was operating at 100% power when conditions arose that caused the crew to abandon the Main Control Room.
- The crew has implemented AOP-C.04, "Shutdown from Auxiliary Control Room," and is commencing a unit cooldown.

Which ONE of the following identifies the operation of the Unit 1 Chemical and Volume Control system controls, before evacuating the MCR?

A. Ensure one CCP placed in Pull to Lock.

B. Place both CCP handswitches in Pull to Lock.

C. Ensure total seal injection flow greater than 24 gpm.

D. Ensure RWST to CCP suction valves, LCV-62-135 and LCV-62-136, Open.

24. Given the following:

- Unit-2 has experienced a small break LOCA that resulted in entry into FR-C.1, "Inadequate Core Cooling."
- While performing FR-C.1, the position of pressurizer PORV block valve 2-FCV-68-332 could not be determined from control room indications.
- The Control Building AUO is dispatched to perform EA-201-1, "480 V Board Room Breaker Alignments."

Which ONE of the following identifies:

(1) the action the control room staff will direct the Control Building AUO to perform in accordance with EA-201-1 to restore valve power

and

(2) if the block valve is subsequently stroked after power restoration, what main control indicating lights, if any, would be lit when the valve is in mid-position?

A. (1) Close the block valve breaker locally at 480V Reactor MOV Board 2B1-B.
(2) Red and green valve positon lights <u>will NOT</u> be lit.

B. (1) Transfer 480V Reactor MOV Board 2B1-B control power to alternate.
(2) Red and green valve position lights <u>will</u> be lit.

C. (1) Close the block valve breaker locally at 480V Reactor MOV Board 2B1-B.
(2) Red and green valve positon lights <u>will</u> be lit.

D. (1) Transfer 480V Reactor MOV Board 2B1-B control power to alternate.
(2) Red and green valve position lights <u>will NOT</u> be lit.

25. Given the following:

- Unit 2 is operating at 100%.
- The crew has just entered AOP-R.06, "High RCS Activity" due to a report from chemistry that the activity level has indicated an increase in the last 2 samples.

Which one of the following identifies...

(1) the reason for contacting Chemistry during performance of AOP-R.06

and

(2) the DOSE EQUIVALENT 131 activity value that will require Tech Spec. LCO 3.4.8, "RCS Specific Activity," to be entered?

A. (1) To ensure the Fuel Reliability Assessment Program is implemented.
(2) 0.16 microcuries/gram

B. (1) To recommend letdown alignment for maximizing the cleanup of the RCS.
(2) 0.16 microcuries/gram

C. (1) To recommend letdown alignment for maximizing the cleanup of the RCS.
(2) 0.36 microcuries/gram

D. (1) To ensure the Fuel Reliability Assessment Program is implemented.
(2) 0.36 microcuries/gram

26. Given the following:

- A LOCA on Unit-2 has resulted in entry into E-1 "Loss of Reactor or Secondary Coolant."
- Unit 2 containment conditions are as follows:
  - Containment pressure is 2.9 psig and stable.
  - Lower Containment radiation is 100 R/hr and slowly increasing.
  - Containment sump level is 65% and slowly increasing.

In accordance with 2-FR-0, "Unit 2 Status Trees," which ONE of the following is the required crew response:

A. Continue in E-1 "Loss of Reactor or Secondary Coolant."

B. Enter FR-Z.1 "High Containment Pressure."

C. Enter FR-Z.2 "Containment Flooding."

D. Enter FR-Z.3 "High Containment Radiation."

27. Given the following plant conditions:

- A large break LOCA has occurred.
- Accumulators have discharged and are isolated.
- ES-1.3, "Transfer to Containment Sump," has been completed.
- Containment sump level is now at 84% and slowly rising.
- FR-Z.2, "Containment Flooding," is in progress.

Which of the following describes;

(1) where the FR-Z.2 required sample is taken,

and

(2) the reason for sampling the containment sump?

	(1)	(2)
A.	RHR system	to determine the level of activity, to allow the TSC to determine if excess sump water can be transferred to tanks outside of containment.
B.	Containment sump	to determine the level of activity, to allow the TSC to determine if excess sump water can be transferred to tanks outside of containment.
C.	RHR system	to ensure shutdown margin is being maintained, since non-borated water has entered the containment sump.
D.	Containment sump	to ensure shutdown margin is being maintained, since non-borated water has entered the containment sump.

28. Given the following:

- With the Unit in Mode 5, the operating crew is preparing to start the #2 Reactor Coolant Pump.
- 1-HS-68-85A, RCP 2 OIL LIFT PUMP 2, has been placed to the START position and the RED light is lit.

Which ONE of the following completes the two statements?

The lift pump must be run for at least _____ before starting of the RCP.

After the Reactor Coolant Pump is started, the Lift Oil pump _____.

A. 60 seconds — must be stopped manually using 1-HS-68-85A after 1 minute

B. 60 seconds — will shutdown automatically after a 1 minute time delay

C. 120 seconds — must be stopped manually using 1-HS-68-85A after 1 minute

D. 120 seconds — will shutdown automatically after a 1 minute time delay

29. Which ONE of the following explains why 1-PCV-62-120, Volume Control Tank H_2 Supply Press Control, is adjusted to maintain Volume Control Tank (VCT) hydrogen pressure between a nominal value of 17 psig and 20 psig when the plant is at power?

A. Ensures adequate NPSH for the CCPs when both pumps are run during pump swap operation.

B. Provides minimum backpressure in CCP miniflow line to prevent excessive flow.

C. Provides minimum backpressure to the RCP #2 seal to ensure adequate flow to #3 seal.

D. Ensures hydrogen concentration in the RCS controlled at 25-35 cc/kg for oxygen scavenging.

30. The RCS is required to be sampled routinely for Chlorides, Flourides and Dissolved Oxygen.

Which ONE of the following is the reason for this required sampling?

A. To provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective actions.

B. To ensure that the long term effects of operating above the steady state limit, but below the transient limit does not adversely effect RCP seal integrity.

C. To reduce the operational dose rates inside containment that would be produced from the activation of dissolved Oxygen, Chlorides and Flourides during power operation.

D. To minimize the adverse effects of continued operation above the limits on the SG tube sheet integrity.

31. Given the following:

- Unit 1 RCS is 230°F
- 1A RHR train is being placed in service per 0-SO-74-1, "Residual Heat Removal System."
- RHR Letdown has been placed in service at maximum flow.
- FCV-63-93, RHR Pump A-A Discharge to Loops 2 and 3 Cold Leg, has just been opened.
- Annunciator "RHR HX A OUTLET TEMPERATURE HIGH," alarms (window E-6 on panel 0-M27-B-A)

Which ONE of the following identifies the valve leaking by that will result in the alarm and the operator action to mitigate in accordance with the Annunciator Response?

	Condition	**Action to mitigate**
A.	FCV-74-16, RHR Hx 1A Outlet Flow Control Valve	Remove RHR Letdown from service.
B.	FCV-74-32, RHR Hx 1A and 1B Bypass Flow Control Valve	Remove RHR Letdown from service.
C.	FCV-74-16, RHR Hx 1A Outlet Flow Control Valve	Increase CCS flow through the 1A-A RHR Heat Exchanger.
D.	FCV-74-32, RHR Hx 1A and 1B Bypass Flow Control Valve	Increase CCS flow through the 1A-A RHR Heat Exchanger.

32. Which ONE of the following identifies the 480v Reactor MOV Boards that supply power to the CCPIT outlet valves, 1-FCV-63-26 and 1-FCV-63-25?

A. 1A1-A and 1B1-B

B. 1A1-A and 1B2-B

C. 1A2-A and 1B1-B

D. 1A2-A and 1B2-B

33. Given the following:

- Unit 1 has experienced a Reactor Trip and Safety Injection from 100% power due to a steam-line break.
- RCS pressure is currently 1850 psig and slowly lowering.
- PRT pressure and level are increasing.
- PRT temperature is constant.

Which ONE of the following is the cause of the changing PRT parameters?

A. A Pressurizer PORV is OPEN.

B. Letdown line relief valve is lifting.

C. RCP seal leakoff flow.

D. Loss of air to the PRT fill valve FCV-68-303.

34. Given the following:

- Unit 1 is operating at 100% power.
- The following alarms are received:
  - "TS-62-78 LTDN HX OUTLET TO DEMIN TEMP HIGH"
  - "LETDOWN HX OUTLET FLOW/TEMP ABNORMAL"
- Letdown Heat Exchanger Outlet Temperature is RISING.
- 1-TCV-62-79, Mixed Bed HI Temp Bypass, has positioned to bypass the letdown de-mineralizers.

Which ONE of the following describes:

(1) the event in progress,

and

(2) the operator action that will be required to mitigate the condition?

A. (1) a leak on the CCS header downstream of the letdown heat exchanger.
(2) Close Letdown Orifice Isolation valves and then close 1-TCV-70-192 to the letdown heat exchanger.

B. (1) a leak on the CCS header downstream of the letdown heat exchanger.
(2) Place 1-HIC-62-78 in Manual and attempt to control temperature.

C. (1) failure of temperature loop TE-62-78, letdown heat exchanger outlet temperature.
(2) Close Letdown Orifice Isolation valves and then close 1-TCV-70-192 to the letdown heat exchanger.

D. (1) failure of temperature loop TE-62-78, letdown heat exchanger outlet temperature.
(2) Place 1-HIC-62-78 in Manual and attempt to control temperature.

35. Given the following:

- Unit 1 is at 100% power.
- VCT pressure is at 18 psig.

Which ONE of the following identifies the location of a CCS leak and the resulting plant condition the leak would cause?

	LEAK LOCATION	CONDITION
A.	RCP Thermal Barrier	TBBP in A-P auto starts
B.	Letdown Heat Exchanger	CCS Rad Monitor rising
C.	RHR 1B-B Heat Exchanger	CCS Surge Tank level rising
D.	Seal Return Heat Exchanger	VCT level dropping

36. Given the following:

- Unit 2 is maintaining 50% power while work is finishing on B MFW pump.
- A plant transient occurs which resulted in PZR pressure dropping to 2150 psig and PZR level lowering to 15%.
- Currently PZR pressure is 2200 psig and PZR level is 30%.

Assuming **NO** operator action, which ONE of the following describes the current status of the PZR heaters, ?

A. All Backup and Control group heaters will be OFF.

B. All Backup and Control group heaters will be ON.

C. All Backup heaters will be ON and Control group D heaters will be OFF.

D. Backup heaters A & B will be OFF and Control group D heaters will be ON.

37. Given the following:

- Unit 1 is operating at 80% power during a plant startup

Assuming that RCS and flux distribution parameters remain on program/target, as power is raised to 100%, which ONE of the following identifies how OTDT and OPDT reactor protection setpoints change?

	OTDT setpoint	**OPDT setpoint**
A.	increase	stay the same
B.	decrease	decrease
C.	decrease	stay the same
D.	stay the same	increase

38. Given the following plant conditions:

- Unit 1 is at 100% power.
- Pressurizer pressure Channel I, 1-PT-68-340, has been removed from service for surveillance testing with its associated bistables tripped.
- Pressurizer pressure Channel IV, 1-PT-68-322, fails high.

Which ONE of the following describes the <u>immediate</u> result of these conditions?

A. Both Reactor trip and Safety Injection occur.
PZR PORV, 1-PCV-68-340 opens; PZR PORV, 1-PCV-68-334 opens.

B. A Reactor trip but **NO** Safety Injection occurs.
PZR PORV, 1-PCV-68-340 opens; PZR PORV, 1-PCV-68-334 remains closed.

C. Both Reactor trip and Safety Injection occur.
PZR PORV, 1-PCV-68-340 remains closed; PZR PORV, 1-PCV-68-334 opens.

D. A Reactor trip but **NO** Safety Injection occurs.
PZR PORV, 1-PCV-68-340 remains closed; PZR PORV, 1-PCV-68-334 remains closed.

39. Given the following plant conditions:

- Reactor power is 100%.
- RWST level instrument 1-LT-63-52 has failed and has been removed from service in accordance with AOP-I.09, "RWST Level Instrument Malfunction."
- The RO notices that RWST level instrument 1-LT-63-50 failed off-scale high.
- All other RWST level indicators (1-LT-63-51, 53) are at 99%.

Which ONE of the following describes the initial impact of this failure?

A. Train A RHR suction auto swapover is disabled, Train B RHR suction auto swapover is available.

B. Train B RHR suction auto swapover is disabled, Train A RHR suction auto swapover is available.

C. Both trains of RHR suction auto swapover are unavailable.

D. Both trains of RHR suction auto swapover are available.

40. Which ONE of the following describes the effect of an increase in containment lower compartment air temperature from 110°F to 130°F over a 10 minute period?

A. Control Rod Drive Mechanism damage.

B. Neutron Detector and/or cable damage.

C. Pressurizer PORV leakage.

D. Pressurizer Safety Valve leakage.

41. Which ONE of the following ice condenser temperatures is within the optimal range in accordance with 0-SO-61-1, "Ice Condenser Cooling" and one of the potential adverse affects of being outside this range?

A. 19°F; excessive concrete expansion

B. 19°F; operation outside technical specification limit

C. 27°F; excessive concrete expansion

D. 27°F; operation outside technical specification limit

42. Given the following plant conditions and time line:

- 1200 - Unit 1 Reactor trip and Safety Injection due to a LOCA.
- 1201 - RCS pressure is 1800 psig and dropping.
- 1205 - Cntmt pressure is 1.5 psig.
- 1205 - Loss of offsite power occurred just as the crew completed the immediate operator actions of E-0, "Reactor Trip or Safety Injection."
- 1206 - Cntmt pressure is 3.1 psig.
- 1206 - RCS pressure is 1400 psig and dropping.

Which ONE of the following describes the status of the Containment Spray (CS) system 2 minutes after the Emergency Diesel Generators restored power to their respective shutdown boards?

A. CS pumps RUNNING; spray header isolation valves CLOSED.

B. CS pumps RUNNING; spray header isolation valves OPEN.

C. CS pumps OFF; spray header isolation valves CLOSED.

D. CS pumps OFF; spray header isolation valves OPEN.

43. Which ONE of the following is correct regarding the logic for MANUAL actuation of a phase B Isolation?

A. Operation of any one of 4 handswitches will actuate both trains.

B. Operation of either 1-HS-30-64A (M-6) or 1-HS-30-68A (M-5) will actuate train A ONLY.

C. Operation of the paired handswitches (M-5 or M-6) operated sequentially will actuate both trains.

D. Operation of the paired handswitches (M-5 or M-6) operated simultaneously will actuate both trains.

44. Given the following plant conditions:

- A plant cooldown is in progress.
- RCS pressure is 1850 psig.
- RCS temperature is 505°F.
- All required actions have been taken for the cooldown in accordance with plant procedures.

An event occurs:

- RCS pressure is 1700 psig and lowering at 10 psi per second.
- SG pressures are 600 psig and lowering at 25 psi per second.
- Containment pressure is 1.2 psig and rising.

Assuming all equipment operates as designed, which ONE of the following identifies the ESF actuation status?

A. Both Safety Injection and Main Steam Line Isolation have occurred.

B. Safety Injection has occurred; Main Steam Line Isolation has NOT.

C. Safety Injection has NOT occurred; Main Steam Line Isolation has.

D. Neither Safety Injection nor Main Steam Isolation have occurred.

45. Given the following:

- Unit 1 was operating at 26% power.
- The #3 SG Main Feedwater Reg valve failed to the closed position.
- Operators tripped the reactor in anticipation of an automatic trip.
- Level in #3 SG dropped to 9% NR, and is recovering.
- Levels in 1, 2, and 4 SGs dropped to 21% NR, and are recovering.
- RCS is currently at 547°F and 2235 psig.

Which ONE of the following identifies the Auxiliary Feedwater (AFW) pumps that would have been automatically started during the event?

A. Motor Driven Pump 1A-A, ONLY.

B. Motor Driven Pump 1B-B, ONLY.

C. Both Motor Driven Pumps, ONLY.

D. All three of the AFW pumps.

46. Given the following conditions:

- Unit 1 is at 90% RTP steady state.
- Loop 2 main feed regulating valve fails full closed over a period of 1 minute.
- All other controls respond as expected.

Assuming **NO** operator action, which ONE of the following alarms will be received FIRST?

A. "LS-3-42D STEAM GEN LVL HIGH - LOW DEVIATION," (M5-A, B7)

B. "LS-3-52D STM GEN LOOP 2 LOW FW FLOW - LOW WATER LEVEL," (M6-B, B1)

C. "FS-3-48B STM GEN LOOP 2 STEAM/FEEDWATER FLOW MISMATCH," (M6-B, B7)

D. "LS-3-156D STM GEN #2 LEVEL LOW," (M3-C, C4)

47. Given the following plant conditions:

- Unit 2 is in Mode 1.
- The TDAFW Pump is tagged out of service.
- A Loss of Feedwater causes a reactor trip.
- Coincident with the trip, Shutdown Board 2B-B de-energizes on fault.

Which ONE of the following describes the SGs that will receive AFW flow and the expected flow rate to those SGs?

A. 1 and 2 SGs being fed at 220 GPM each

B. 1 and 2 SGs being fed at 440 GPM each

C. 3 and 4 SGs being fed at 220 GPM each

D. 3 and 4 SGs being fed at 440 GPM each

48. Given the following;

- A Safety Injection signal on Unit-1
- All shutdown boards are being supplied by their respective Start buses.
- The Control Building AUO has been dispatched to reset the D/G auto start signal(s) per EA-82-1, "Placing D/G's in Standby."

In accordance with EA-82-1, which ONE of the following identifies;

(1) the D/G 43T(L) switches that must be placed in "Test"

and

(2) the condition of the "EMERG START LOCKOUT RELAY," amber light, on the associated 0-M-26 panel <u>after</u> reset?

	D/G 43T(L) switches in Test	**Amber light**
A.	1A and 1B only	Lit
B.	1A and 1B only	Not Lit
C.	1A, 1B, 2A, and 2B	Lit
D.	1A, 1B, 2A, and 2B	Not Lit

49. Given the following:

- Unit 1 operating at 100% power with all system in a normal alignment.

Which ONE of the following would occur if the 125V DC Vital Battery Charger 1-I output breaker tripped open?

A. Annunciator "125V DC VITAL BAT BD I ABNORMAL" would alarm and EI-57-92, Batt BD I AMPS, would be indicating upscale from zero.

B. Annunciator "125V DC VITAL BAT BD I ABNORMAL" would alarm and EI-57-92, Batt BD I AMPS, would be indicating downscale from zero.

C. Annunciator "125 V DC VITAL CHGR I FAILURE OR VITAL BAT I DISCHARGE" would alarm and EI-57-92, Batt BD I AMPS, would be indicating upscale from zero.

D. Annunciator "125 V DC VITAL CHGR I FAILURE OR VITAL BAT I DISCHARGE" would alarm and EI-57-92, Batt BD I AMPS, would be indicating downscale from zero.

50. Given the following:

- The 2A D/G is in service for post maintenance testing and is being loaded to 4.4 MW in accordance with 0-SO-82-3, "Diesel Generator 2A-A."
- Currently the load on the diesel is 2.0 MW.
- The outside AUO has just reported that the exhaust from the 2A D/G is black and estimates it to be 2-3 times more dense than normal.

In accordance with 0-SO-82-3, which ONE of the following identifies the required operator action(s)?

A. Trip the 2A D/G and notify the Site Environmental Manager.

B. The load increase may continue as long as the exhaust smoke density does not get worse.

C. Stop the load increase and notify the Shift Manager to contact Site Environmental Manager.

D. Immediately reduce 2A D/G load to less than 1.6 MW or until the exhaust smoke clears.

51. Unit 1 conditions are as follows:

- The unit has been at 100% power
- Total primary to secondary leakage is 70 gpd
- Identified RCS leakage is 0.18 gpm
- Unidentified RCS leakage is 0.2 gpm
- Pzr level, VCT level, charging flow, and letdown flow are all stable

Which ONE of the following conditions would provide the first indications in the control room of a developing fuel element defect?

A. Annunciator "1-RA-272A UPPR IN CNTMT HI RAD" alarms and a rapidly increasing count rate on 1-RM-90-112A/B/C "Upper Containment Air Monitor."

B. A rapidly increasing count rate on 1-RM-90-119 "Condenser Vacuum Exhaust Monitor" and a rapidly increasing count rate on 1-RM-90-112A/B/C "Upper Containment Air Monitor."

C. A slowly increasing count rate on 1-RM-90-130A and -131A "Containment Purge Exhaust Monitors" and Annunciator "1-RA-272A UPPR IN CNTMT HI RAD" alarms.

D. A slowly increasing count rate on 1-RM-90-106A/B "Lower Containment Air Monitor" and a slowly increasing count rate on 1-RM-90-119 "Condenser Vacuum Exhaust Monitor."

52. Given the following plant alarms:

- 0-RA-90-125A, "MAIN CNTRL RM INTAKE MON HIGH RAD"
- 0-RA-90-126A, "MAIN CNTRL RM INTAKE MON HIGH RAD"

Which ONE of the following describes the Main Control Room ventilation alignment?

The MCR is maintained at a _____

A. positive pressure by the Main Control Room Air Handling Units.

B. negative pressure by the Main Control Room Air Handling Units.

C. a positive pressure by the Control Building Emergency Air Pressurization Fans.

D. a negative pressure by the Control Building Emergency Air Pressurization Fans.

53. Which ONE of the following identifies the 480v board that supplies power for 0-FCV-67-152, CCS Heat Exchanger 0B1 & 0B2 Discharge Valve?

A. 1B1-B Reactor MOV board

B. 2B2-B Reactor MOV Board

C. 1B1-B Shutdown Board

D. 2B1-B Shutdown Board

54. Given the following plant conditions:

- The Unit 1 is at 100% power.
- A leak develops on the Control Air system.
- Control air pressure is 72 psig and DECREASING.

Which ONE of the following identifies the system response that should have occurred to maintain Train A Essential Air Header pressure?

A. 1-FCV-32-110, Reactor Building Non-essential air valve, goes closed.

B. 1-FCV-32-82, Train A Control Air Supply valve, automatically closes.

C. 0-PCV-33-4, Service Air Receiver isolation valve, goes open.

D. Auxiliary air compressor A-A starts and loads.

55. Given the following:

- Unit 1 is in Mode 6.
- Reactor vessel head lift is in progress.
- Steady buzzing horn sounds in containment.

Which ONE of the following describes the Event and the Immediate Action that is required to be implemented?

	Event	**Immediate Action**
A.	Polar Crane malfunction	Place reactor vessel head on stand
B.	Polar Crane malfunction	Stop reactor vessel head lift
C.	Source Range High Flux Level at Shutdown Alarm.	Evacuate Containment
D.	Source Range High Flux Level at Shutdown Alarm.	Reset Shutdown Monitor

56. Which ONE of the following is the primary source of power to the Rod Control Logic Cabinets?

A. Rectified AC from the Rod Drive MG output.

B. Rectified AC from 120 VAC Instrument Bus.

C. 125V DC stepped down from station battery boards.

D. 250V DC stepped down from station battery boards.

57. Given the following plant conditions:

- Unit 2 is responding to a small break LOCA in ES-1.1, "SI Termination."
- RCPs have been tripped.
- Pressurizer level is steady.
- Only one train of ECCS is injecting.
- Loop 1 temperatures are representative of all 4 loops.
- Steam generator pressures are the same as steam header pressure.

Which ONE of the following sets of plant parameters is indicative of natural circulation occurring in the RCS?

	Time			
	0200	**0205**	**0210**	**0215**
A. Steam Header Pressure (psig)	1042	1009	976	945
RC System Pressure (psig)	1968	1964	1960	1958
Loop 1 T-hot (°F)	579	574	569	564
Loop 1 T-cold (°F)	548	544	540	536
B. Steam Header Pressure (psig)	1042	1009	976	945
RC System Pressure (psig)	1968	1972	1975	1981
Loop 1 T-hot (°F)	579	582	585	595
Loop 1 T-cold (°F)	548	544	540	536
C. Steam Header Pressure (psig)	1042	1047	1050	1052
RC System Pressure (psig)	1968	1964	1960	1958
Loop 1 T-hot (°F)	579	574	569	564
Loop 1 T-cold (°F)	570	571	570	572
D. Steam Header Pressure (psig)	1042	1047	1050	1052
RC System Pressure (psig)	1968	1972	1975	1981
Loop 1 T-hot (°F)	579	582	585	595
Loop 1 T-cold (°F)	548	544	540	536

58. Given the following:

- Unit 2 operating at 10% reactor power.
- **CONDITION 1**: Two hours following a reactor trip and trip of all RCPs.
- **CONDITION 2**: Two hours following a reactor trip with all RCPs running.

Which ONE of the following identifies the correct combination of expected indications for incore thermocouple temperatures (TCs) and RCS cold leg temperatures (T_{cold}) for the stated conditions?

	CONDITION 1 (No RCPs)	**CONDITION 2** (ALL RCPs)
A.	TCs only slightly above T_{cold}	TCs several degrees greater than T_{cold}
B.	TCs only slightly above T_{cold}	TCs only slightly above T_{cold}
C.	TCs several degrees greater than T_{cold}	TCs several degrees greater than T_{cold}
D.	TCs several degrees greater than T_{cold}	TCs only slightly above T_{cold}

59. Given the following:

- A LOCA has occurred on Unit 1.
- One train of EGTS has been removed from service in accordance with E-1, "Loss of Reactor or Secondary Coolant."

Which ONE of the following identifies ...

(1) the purpose of the charcoal filter on the suction side of the EGTS cleanup fan,

and

(2) why flow is maintained through the EGTS Filter removed from service?

A. (1) To remove iodine and other halogen gases.
(2) To remove the heat generated in the charcoal bed.

B. (1) To remove iodine and other halogen gases.
(2) To prevent corrosive carbolic acid build-up in the charcoal bed.

C. (1) To remove Cesium and other particulates.
(2) To remove the heat generated in the charcoal bed.

D. (1) To remove Cesium and other particulates.
(2) To prevent corrosive carbolic acid build-up in the charcoal bed.

60. Given the following:

- Unit 1 has experienced a Large break LOCA.
- FR-C.1,"Inadequate Core Cooling," is being implemented.
- Containment pressure is 10 psig and slowly lowering.
- Containment hydrogen concentration is 6.5% and slowly rising.

Which ONE of following identifies the Hydrogen Recombiner operation?

Hydrogen recombiner operation....

A. is not allowed because of the operation of containment spray.

B. is allowed provided the hydrogen igniters have previously been placed in service.

C. is allowed however the maximum power setting is limited due to elevated containment pressure.

D. is not allowed because it may cause a sudden rise in containment pressure that may challenge containment Integrity.

61. Which ONE of the following describes the function of the Unit 2 Manipulator Crane SENSOTEC load system interlock, SEN 10H, "heavy assembly" overload limit switch?

A. Prevents the gripper from disengaging at any bridge location.

B. Stops upward motion of the hoist and illuminates the overload light.

C. Acts as a backup to the SEN 9H, "light assembly" overload limit switch if it malfunctions.

D. Stops all motion of the hoist, up or down, illuminates the overload light until the JOG pushbutton is depressed.

62. Technical Specifications require two (2) Residual Heat Removal (RHR) loops to be operable during cold shutdown. Certain equipment may be substituted for one of the RHR loops.

Which ONE of the following conditions will satisfy this substitution requirement?

A. Four filled RCS loops with 2 steam generators with levels greater than or equal to 10% (wide range).

B. Four filled RCS loops with 1 SI pump and RWST level > 50%.

C. Four filled RCS loops with 2 operable RCP's and 1 operable AFW Pump with CST level > 50%.

D. Four filled RCS loops with 1 operable RCP and 1 SI Pump.

63. Given the following:

- Unit 1 heatup following a MODE 5 outage is being performed and the crew is preparing to establish vacuum in the main condenser.

Which ONE of the following identifies when ODCM 1/2.1.2 "Radioactive Gaseous Effluent Monitoring Instrumentation" requirements for the condenser vacuum exhaust must first be met?

A. When the first vacuum pump is started to begin pulling vacuum.

B. When "C-9 CONDENSER INTERLOCK" permissive window is lit.

C. When "PS-2-7B CONDENSER VACUUM LOW" annunciator window clears.

D. When the turbine throttle valves are first opened to roll the turbine.

64. Which ONE of the following identifies;

(1) the normal pressure range for Waste Gas Vent Header pressure

and

(2) how pressure is prevented from decreasing below minimum while a Waste Gas compressor is running after being manually started?

A. (1) 0.5 psig - 2.0 psig
(2) A pressure control valve on the discharge of the compressor throttles in the closed direction as the vent header pressure drops.

B. (1) 0.5 psig - 2.0 psig
(2) A pressure control valve opens to recirculate the compressor discharge back to the suction as the vent header pressure drops.

C. (1) 0.2 psig - 5.0 psig
(2) A pressure control valve on the discharge of the compressor throttles in the closed direction as the vent header pressure drops.

D. (1) 0.2 psig - 5.0 psig
(2) A pressure control valve opens to recirculate the compressor discharge back to the suction as the vent header pressure drops.

65. Given the following:

- Unit 2 is operating at 100% power when 2A Condenser Circulating Water Pump trips.
- Annunciator "PS-2-7B CONDENSER VACUUM LOW" alarms.
- Operators implement AOP-S.02, "Loss of Condenser Vacuum."

In accordance with AOP-S.02, which ONE of the following identifies...

(1) the relationship between turbine trip and steam dump valve condenser interlock,

and

(2) the lowest condenser pressure, that if exceeded will require the reactor to be immediately tripped?

A. (1) Turbine will automatically trip before the Steam Dump valve condenser interlock will be lost.
(2) 3.5 psia

B. (1) Turbine will automatically trip before the Steam Dump valve condenser interlock will be lost.
(2) 5.4 psia

C. (1) Steam Dump valve condenser interlock will be lost before the Turbine will automatically trip
(2) 3.5 psia

D. (1) Steam Dump valve condenser interlock will be lost before the Turbine will automatically trip
(2) 5.4 psia

66. Given the following:

- Unit 1 is starting up after a refueling outage.
- The Condenser Circulating Water (CCW) system is being started up.
- At 0800, CCW pump 1A was started and immediately secured due to a water box cover leaking.
- At 0810, CCW pump 1A was restarted and reached rated speed but subsequently tripped.
- At 0815, the cause of the trip was identified and repaired.

Which ONE of the following identifies the earliest time that CCW pump 1A could be restarted?

A. 0815

B. 0830

C. 0855

D. 0900

67. Given the following:

- A plant startup on Unit 1 is in progress at 18% power.
- Turbine load is ~125 MW.
- A malfunction of the "A" feed pump control oil system causes feed pump speed to lower.
- Feedwater discharge pressure decreases below SG pressure.
- Immediate operator actions to restore feedwater pressure to normal are NOT successful.

In accordance with AOP-S.01, "Main Feedwater Malfunctions," which ONE of the following describes the required operator action(s)?

A. Trip the reactor.

B. Manually start all AFW pumps.

C. Manually start all AFW pumps and trip the "A" main feedwater pump.

D. Reduce turbine load until feedwater flow is greater than steam flow.

68. Given the following Unit 2 plant conditions:

- Two AUOs were performing an alignment on the 2A-A Safety Injection Pump.
- The independent verifier identified a valve that was not in its required position.

Which ONE of the following describes the required action(s) that must be taken by the independent verifier?

A. Correctly position the valve, then notify the U-2 SRO of the discrepancy.

B. Stop performance of the valve checklist and immediately notify the U-2 SRO for determination of proper corrective actions.

C. Correctly position the valve, then have an additional operator independently verify the valve is in the proper position.

D. Document the valve position discrepancy on the valve checklist, then continue with the independent verification of the remaining valves on the checklist. Notify the U-2 SRO when complete.

69. During a prejob brief, an operator discovers a procedure step that meets the "CRITICAL STEP" criteria listed in SPP-2.2, "Administration of Site Technical Procedures," however it is not identified as a "CRITICAL STEP."

Which ONE of the following is the minimum action required to allow the procedure to be used at this time?

A. Process a One Time Only change.

B. Process an Urgent Procedure change.

C. Flag the step to identify it as critical.

D. Process a Minor Editorial change.

70. Given the following plant conditions:

- Unit 1 at 100% power.
- Unit 2 core off-load is complete.
- Fuel shuffle in the Spent Fuel Pit is in progress.
- "0-RA-90-102A FUEL POOL RAD MONITOR HI RAD" alarm sounds.
- Radiation level indicated on 0-RM-90-102 is 60 mr/hr and increasing.
- Radiation level indicated on 0-RM-90-103 is 30 mr/hr and increasing.

In accordance with the alarm response procedure, which ONE of the following describes the required operator action(s), if any?

A. No operator action is required.

B. Announce on the PA System to evacuate the Auxiliary Building and dispatch maintenance personnel to close the U-2 Equipment Hatch.

C. Verify the Auxiliary Building General Supply and Exhaust Fans are shutdown; manually actuate BOTH A & B-Train Auxiliary Building Isolation.

D. Verify the Auxiliary Building General Supply and Exhaust Fans and Fuel Handling Exhaust Fans are shutdown; manually actuate ONLY B-Train Auxiliary Building Isolation.

71. Given the following plant conditions:

- Unit 2 is steady-state at 100% power
- All systems are aligned normally for Mode 1

Which ONE of the following radiation monitors has Operability requirements by a Mode 1 Technical Specification LCO?

A. 0-RM-90-135, "MCR AREA RADMON"

B. 2-RM-90-274, "LOWER CONTAINMENT POST ACCIDENT AREA MONITOR-HI RNGE"

C. 2-RM-90-256, "CONDR VAC EXH HI RNGE MONITOR"

D. 2-RM-90-1, "SPENT FUEL PIT AREA RADMON"

72. Given the following plant conditions:

- A LOCA has occurred and a Site Area Emergency has been declared.
- The TSC and OSC have been activated.
- To prevent damage to equipment needed for protection of the public, it is recommended that an individual make an entry into the 1A-A Safety Injection Pump Room 1A.
- Projected dose rate in the pump room is 1.0×10^5 mR/hr.
- Duration of the exposure is expected to be 6 minutes.

Which ONE of the following individuals must authorize this exposure?

A. Radcon Manager

B. Site Emergency Director

C. Plant Manager

D. Site Vice President

73. Which ONE of the following completes both of the following statements in accordance with EPIP-8, Personnel Accountability & Evacuation?

During a _____ , the "2-Person-Line-of-Sight Rule" is required.

The "2-Person-Line-of-Sight Rule" requires that _____ .

A. General Emergency;
all persons in vital areas must remain in visual contact with another person and the two persons also must possess similar skills or knowledge.

B. General Emergency;
all persons in vital areas must remain in visual contact with another person but the two persons do **NOT** have to possess similar skills or knowledge.

C. Credible Insider Threat;
all persons in vital areas must remain in visual contact with another person and the two persons also must possess similar skills or knowledge.

D. Credible Insider Threat;
all persons in vital areas must remain in visual contact with another person but the two persons do **NOT** have to possess similar skills or knowledge.

74. Given the following plant conditions:

- Unit 2 is operating at 100% RTP.
- Two hours after shift change the OATC notices all lit channel B annunciator windows change to the dark condition.
- The "B" channel main controller card and "B" train scanner boards show no failures when tested using the ADDS terminal per 0-SO-55-1, "Annunciator System."

In accordance with 0-SO-55-1, which ONE of the devices below, if any, could be used to monitor "B" Train annunciator channel?

A. The Unit-2 annunciator printer.

B. The CRT located on the Shift Manager's desk.

C. The CRT located on the Unit 2 UO work station.

D. There is no alternate monitoring device for the "B" Train annunciator windows.

75. The operating crew is performing an RCS cooldown at maximum rate in accordance with E-3, "Steam Generator Tube Rupture." During this cooldown, the RCS pressure decreases to 1150 psig.

Which ONE of the following identifies the strategy for Reactor Coolant Pump trip criteria?

A. The RCP trip criteria does not apply during the operator initiated cooldown.

B. The RCPs should be tripped whenever RCS pressure decreases to less than 1250 psig.

C. The RCPs should be tripped when RCS pressure is less than 1250 psig and a Charging pump is verified running.

D. The RCP trip criteria does not apply anytime during performance of E-3.

You have completed the test!

Sequoyah Sept 2010
NRC Examination
RO Reference Package

1. Steam Tables

2. Mollier diagram

U.S. Nuclear Regulatory Commission

Site-Specific SRO Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit: Sequoyah Nuclear Plants 1 & 2
Region: I ☐ II X III ☐ IV ☐	Reactor Type: W X CE ☐ BW ☐ GE ☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

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

_____
Applicant's Signature

Results	
RO/SRO-Only/Total Examination Values	____ / ____ / ____ Points
Applicant's Scores	____ / ____ / ____ Points
Applicant's Grade	____ / ____ / ____ Percent

1. Given the following:

   - Unit 2 was operating at 100% power when the following indications were observed:
     - PZR pressure at 2100 psig and rapidly decreasing
     - Tavg 578°F and stable
     - PZR level 65% and rising

   - 30 secs later the Reactor was manually tripped by the operator and the following indications were noted upon completing the immediate operator actions:
     - PZR pressure 1800 psig and decreasing
     - RCS temp 547°F and slowly lowering
     - PZR level 75% and rapidly rising

   Which ONE of the following accidents would provide these indications?

   A. Ejected Control Rod

   B. PZR Vapor Space Break

   C. SBLOCA on the RCS Cold-leg

   D. Feedline Break Inside Containment

2. Given the following conditions:

   - A large break LOCA occurred
   - Operators have just completed transfer to containment sump
   - A loss of offsite power occurs

   In accordance with ES-1.3, "Transfer to RHR Containment Sump," which one of the following describes the operator actions required for this condition?

   A. Place the SI pumps and CCPs in Pull-to-Lock until the RHR pumps have been restarted after the shutdown boards are reenergized.

   B. Place the CCPs in Pull-to-Lock until the RHR pumps have been restarted after the shutdown boards are reenergized.

   C. Ensure both RHR pumps are started by the blackout sequencers after the diesel generators reenergize the shutdown boards, then restart the SI pumps.

   D. Ensure ALL ECCS pumps are started by the blackout sequencers when the diesel generators reenergize the shutdown boards.

3. Given the following:

- Unit-1 is operating at 100% power
- The CVCS system in normal alignment and 1B CCP in service.
- The following indications occur concurrently:

- All RCP seal flows decreasing
- Annunciator windows :
  - FS-62-1 REAC COOL PMPS SEAL WATER FLOW LO
  - FS-62-93 A/B CHARGING LINE FLOW ABNORMAL
- 1-FI-62-93A "CHARGING HDR FLOW" decreases from 84 gpm to 52 gpm
- 1-PI-62-92A "CHARGING HDR PRESS" decreases from 2400 psig to 2100 psig
- 1-EI-62-104A "CHARGING PUMP 1B AMPS" increases from 32 to 46 amps
- Demand is slowly increasing on 1-HIC-62-93 "CHARGING FLOW CONTROL"

In accordance with AOP-M.09,"Loss of Charging," which ONE of the following is the required crew response?

A. Stop 1B CCP and place 1A CCP in service.

B. Stop and place the 1B CCP in Pull-to-Lock and monitor RCP seal temperatures.

C. Dispatch auxiliary building AUO to swap in service seal injection filters.

D. Take manual control of charging flow control 1-HIC-62-93A and adjust 1-HIC-62-93A and charging seal water flow control 1-HIC-62-89A to increase seal water flows.

4. Given the following:

   - Unit 1 is in Mode 5 with RCS at Mid-Loop.
   - 1A-A RHR pump in service.

   In accordance with AOP-R.03, "RHR System Malfunction," which ONE of the following action(s) will be required if the 1A-A RHR pump motor amps become very erratic and continue to be erratic even after flow is reduced?

   A. Stop the 1A-A RHR pump and start the 1B-B RHR pump.

   B. Make up to the RCS immediately by opening valve 1-FCV-63-1, RHR suction from RWST.

   C. Stop the 1A-A RHR pump, increase the level in the RCS and attempt to restore RHR cooling.

   D. Make up to the RCS immediately via valves 1-FCV-62-135 & 136, Suction of CCPs from the RWST.

5. Given the following:

- Unit-1 is in Mode 4 aligned for two train RHR cooldown in preparation for refueling.
- Unit-2 is in Mode 1 at 100% power.
- The ERCW cooling valves to CCS heat exchangers are aligned as follows:
- 1-HS-67-146A, "CCS HX 1A1 and 1A2 to Disch Hdr B," is in the "open position."
- 0-HS-67-152A, "CCS HX 0B1 and 0B2 Outlet to Disch Hdr B," is in the "open position," pushed in.
- 2-HS-67-146A, "CCS HX 2A1 and 2A2 to Disch Hdr A," is in the "35% open position."

Which ONE of the following identifies the automatic equipment response to a U-2 Safety Injection signal and the reason.

A. 1-FCV-67-146 repositions to 35% open to ensure adequate flow to the 2A1 and 2A2 CCS heat exchangers.

B. 0-FCV-67-152 repositions to 50% open to ensure adequate flow to "B" train ESF components.

C. 2-FCV-67-146 repositions to 50% open to ensure adequate flow to the 2A1 and 2A2 CCS heat exchangers.

D. 0-FCV-67-152 repositions to 35% open to ensure adequate flow to "B" train ESF components.

6. With both units operating at 100% power a loss of offsite power occurred. Unit-1 shutdown boards were energized two minutes ago from their respective diesel generators.

   Assuming **NO** operator action, which ONE of the following identifies the banks of pressurizer heaters (A, B, C or D,) if any, that are available for pressurizer pressure control at this time?

   A. All heaters are available.

   B. No heaters are available.

   C. A and B, only.

   D. C and D, only.

7. Given the following:

   - An ATWS has occurred and FR-S.1, "Response to Nuclear Power Generation/ATWS," is in progress.
   - While implementing step #2 "**VERIFY** turbine TRIPPED," an SI occurs (caused by a Pressurizer PORV OPENING) and all rods insert.

   Which ONE of the following actions is required be performed?

   A. Immediately exit FR-S.1, and Perform E-0, "Reactor Trip or Safety Injection."

   B. Shut the block valve for the stuck open PORV then transition to E-0 at step 6, "**MONITOR** for SI Signal," of FR-S.1.

   C. Remain in FR-S.1 until completed or directed to transition to another procedure.

   D. Exit FR-S.1 when the RED path clears, and perform the steps of E-1, "Loss of Reactor or Secondary Coolant," then close the block valve to the stuck open PORV.

8. Given the following:

- Unit-2 is in Mode 3 at normal operating temperature and pressure with the main steam isolation valves closed.
- The crew is responding to a manual Safety Injection due to decreasing Pressurizer level.
- While performing actions of E-0, "Reactor Trip or Safety Injection," the crew is at step 21, "Verify Secondary Radiation Normal."

Which ONE of the following identifies how the operator ensures a S/G blowdown sample path exists for identification of the ruptured steam generator?

A. Ensure all aux FW start signals are clear. Verify the red sample valve status light is lit for the S/G to be sampled on 2-M-6.

B. Ensure all aux FW start signals are clear. Ensure inside containment blowdown isolation valve for the S/G to be sampled, red light, is lit on 2-M-4.

C. Ensure phase "A" is reset. Verify the red sample valve status light is lit for the S/G to be sampled on 2-M-6.

D. Ensure phase "A" is reset. Ensure inside containment blowdown isolation valve for the S/G to be sampled, red light, is lit on 2-M-4.

9. The following conditions exist on Unit-1:

- Reactor power is 55%
- Purge is in service for a containment entry
- A feedwater line rupture occurs outside containment

Loop # 3 steam generator narrow range level channels decrease as tabulated below:

TIME	1-LI-3-97	1-LI-3-94	1-LI-3-93
0 minutes	15%	14%	14%
2 minutes	13%	12%	12%
4 minutes	11%	10%	10%
6 minutes	10%	8%	9%

Assuming **NO** operator action, which one of the following identifies the earliest time annunciator panel 1-M4-D window (A-3) "LS-3-97B STM GEN LOOP 3 LEVEL LOW-LOW REACTOR TRIP" will light.

A. 0 minutes

B. 2 minutes

C. 4 minutes

D. 6 minutes

10. Given the following:

- Unit 2 has tripped due to a loss of off-site power.
- Natural circulation flow has been established.
- The present plant conditions are:

  - PZR level 33% and lowering.
  - All SG pressures are ~1000 psig.
  - RCS subcooling is 87°F.

Which ONE of the following indicate the RCS loop wide range cold leg temperatures?

A. 532 - 536°F

B. 538 - 542°F

C. 544 - 548°F

D. 550 - 554°F

11. Given the following:

- Unit 1 is at 100% RTP.
- MCR alarms received indicate that an electrical board has failed.
- All trip status lights on Panel 1-XX-55-5 (1-M-5) are OFF .
- The crew responds in accordance with the appropriate procedure.

Which ONE of the following identifies...

(1) the electrical board that failed

and

(2) the reason that manipulation of Auxiliary Feedwater (AFW) controls will be required?

	(1)	(2)
A.	120 VAC Vital Instrument Board 1-I.	To prevent overcooling due to excessive AFW flow due to the LCVs failing open.
B.	120 VAC Vital Instrument Board 1-I.	To allow the turbine driven AFW pump to be operated above minimum speed.
C.	120 VAC Vital Instrument Board 1-II.	To prevent overcooling due to excessive AFW flow due to the LCVs failing open.
D.	120 VAC Vital Instrument Board 1-II.	To allow the turbine driven AFW pump to be operated above minimum speed.

12. Given the following plant conditions:

- Units 1 and 2 are operating at 100% power.
- The 125 V DC Power System is normally aligned except Vital Battery Board IV, which is being supplied from the Vital Battery V and 2-S Vital Battery Charger.
- Offsite power is lost.
- 1A-A and 2B-B diesel generators start and load.
- 1B-B and 2A-A diesel generators fail to start.

Assuming **NO** operator action is taken, if offsite power has been lost for 5 hours, which ONE of the following statements identifies the condition of the 125V Vital DC battery boards?

A. All four 125v Vital DC Battery Boards would be at their normal voltage.

B. All four 125v Vital DC Battery Boards would be at lower than normal voltage.

C. 125v Vital DC Battery Boards I and IV would be at their normal voltage.

125v Vital DC Battery Boards II and III would be at lower than normal voltage.

D. 125v Vital DC Battery Boards II and III would be at their normal voltage.

125v Vital DC Battery Boards I and IV would be at lower than normal voltage.

13. Given the following plant conditions:

- A Safety Injection has occurred on Unit 1.
- D/G 1A-A and 1B-B are running.
- ERCW pump L-B is not running and M-B failed to automatically start.
- All other equipment functioned as designed.

Assuming **NO** operator action, which ONE of the following describes the effect this failure will have on 1B-B D/G?

A. If ERCW pump L-B or M-B is not started, 1B-B D/G will automatically trip on high Jacket Water temperature.

B. 1B-B D/G will be unaffected since the ERCW Headers 1B and 2B are crosstied.

C. 1B-B D/G will be unaffected since the ERCW Headers 1A and 1B are crosstied.

D. If ERCW pump L-B or M-B is not started, 1B-B D/G will experience high Main Bearing temperatures.

14. Given the following conditions:

- Unit-1 is at 100% power.
- All systems normally aligned.
- The Transmission Operator has notified the plant that system grid voltage is high and forecasted to go higher.
- The Transmission Operator requests the plant to take in the maximum value of MVARs to help stabilize the grid.

Which ONE of the following transmission lines out of service affects the maximum allowed MVAR incoming value on Unit 1, and how is the adjustment made in accordance with 0-GO-5, "Normal Power Operation?"

	TRANSMISSION LINE	METHOD OF ADJUSTMENT
A.	A 500 KV line	Exciter Voltage Auto Adjuster
B.	A 161 KV line	Exciter Voltage Base Adjuster
C.	A 161 KV line	Exciter Voltage Auto Adjuster
D.	A 500 KV line	Exciter Voltage Base Adjuster

15. Given the following:

- Unit 1 was operating at 100% power when a small break LOCA occurred.
- The crew has implemented ECA-1.2, "LOCA Outside Containment," due to alarm "AUX BLDG HIGH ENERGY LINE BREAK" being LIT.
- The crew closes RHR Train A cold leg injection valve, FCV-63-93, in accordance with ECA-1.2.
- RCS pressure is now 1495 psig and slowly rising.

Which ONE of the following pumps is contributing the most to the decrease in RWST level?

A. 1B-B Safety Injection pump

B. 1A-A Containment Spray pump

C. 1B-B RHR pump

D. 1A-A CCP injecting through CCPIT

16. In accordance with EPM-3-FR-H.1, "Basis Document For FR-H.1 Loss Of Secondary Heat Sink," which ONE of the following is the reason the RCPs are tripped during performance of FR-H.1, "Response to Loss of Secondary Heat Sink"?

A. To extend the effectiveness of the remaining water inventory in the steam generators.

B. To delay the pressure rise to the PORV setpoint by lowering core delta P.

C. To allow natural circulation to be established prior to losing the steam generators as a heat sink.

D. To prevent excessive inventory loss through open PORVs if bleed and feed is necessary.

17. Given the following conditions:

- With Unit 1 initally at full power a large break LOCA occurred.
- Containment pressure = 11 psig.
- Both Containment Spray Pumps are running.
- Containment sump level = 52%.
- RWST level = 26%.
- The crew transitioned to ECA-1.1, "Loss Of RHR Sump Recirculation," due to the inability to open either of the Containment Sump suction valves,
  1-FCV-63-72, "CNTMT Sump Suct to RHR Pump 1A,"
  or
  1-FCV-63-73, "CNTMT Sump Suct to RHR Pump 1B."
- The crew is determining the proper containment spray pump alignment and operation.

In accordance with ECA-1.1, which ONE of the following will result in the proper alignment of the containment spray pumps under existing plant conditions?

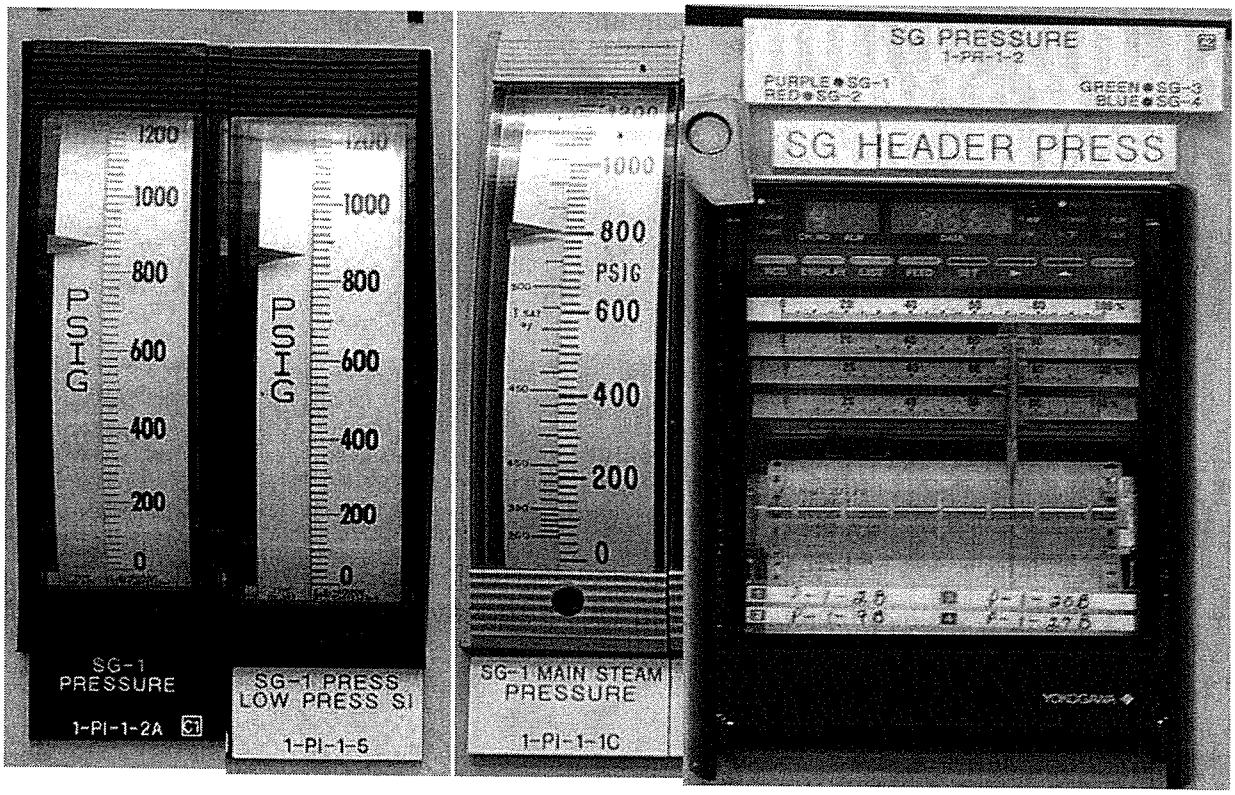
A. Stop both containment spray pumps and place the handswitches in PULL TO LOCK.

B. Continue to run both containment spray pumps until RWST level is less than 8%, then stop both containment spray pumps.

C. Stop one containment spray pump and allow the remaining containment spray pump to take suction from the RWST.

D. Stop both containment spray pumps until suction can be aligned to the containment sump, then restart one containment spray pump.

18. Given the following picture of various SG#1 pressure indications:



Which ONE of the pictured indicators is the Post Accident Monitoring (PAM), Category 1, indication that would be used to indentify/indicate a Steam Line Break on SG#1?

A. 1-PI-1-2A
B. 1-PI-1-5
C. 1-PI-1-1C
D. 1-PR-1-2

19. Plant conditions are as follows:

- Unit 2 is at 100% steady state power.
- The Pressurizer Level Control Selector Switch, 2-XS-66-339E, is selected to LT-339/320.

Assuming **NO** operator action, which ONE of the following describes the response(s) of the pressurizer level control system if the bellows inside the differential pressure cell for pressurizer level transmitter 2-LT-68-320 develops a leak?

A. Backup heaters energize and annunciator "LS-68-339E/F PRESSURIZER LEVEL HIGH BACKUP HTRS ON," alarms.

B. Letdown isolates, pressurizer heaters deenergize and annunciator "LS-68-339E/F PRZR LVL LOW HEATER OFF & LETDOWN SECURED," alarms.

C. Charging flow increases and annunciator "LS-68-335D/E PRESSURIZER LEVEL HIGH-LOW," alarms.

D. Charging flow remains constant and annunciator "LS-68-335D/E PRESSURIZER LEVEL HIGH-LOW," alarms

20. Given the following:

- Unit 2 is at 100% power with N31,"Source Range Channel I," out of service for maintenance.
- A loss of all AC power has occurred on Unit 2.
- The actions required by ECA-0.0, "Loss of All AC Power," are in progress.
- SG atmospheric relief valves are being controlled locally to reduce SG pressure to less than 160 psig.
- A low steam line pressure SI signal has been received.
- Steam line pressure is 350 psig and RCS cold leg temperatures are 325 °F.
- The OATC reports that N32, "Source Range Channel II," startup rate indicated positive then dropped to zero.
- The STA monitoring the CSF status trees informs the shift supervisor that there is an Orange path on Subcriticality.
- Both Intermediate range startup rates are reading a sustained +0.2 dpm.

In accordance with ECA-0.0, which ONE of the following actions is required to be taken and the reason for this action?

A. Begin an emergency boration to add negative reactivity.

B. Stop dumping steam and allow the plant to heat up to add negative reactivity.

C. Continue to lower SG pressure to < 160 psig to inject the Cold Leg Accumulators thus adding negative reactivity.

D. Proceed immediately to FR-S.1,"Nuclear Power Generation/ATWS," due to Orange path on Critical Safety Function Status Trees.

21. Which ONE of the following failures of the Intermediate Range Nuclear Instrumentation system would require Duty Plant Manager notification for actuation of the reactor protection system?

A. With Reactor power at 20%, control power fails on both intermediate channels.

B. With Reactor power at 98%, Intermediate range channel N-35 fails high with N-36 previously removed from service.

C. Power is decreased from 12% to 8% following completion of actions for removing N-36 from service due to loss of control power.

D. Power is decreased from 12% to 8% following completion of actions for removing N-36 from service due to loss of instrument power.

22. The following plant conditions exist:

- Refueling is in progress on Unit 1.
- A spent fuel element is being moved from the reactor to the upender.
- The spent fuel element is dropped to the bottom of the canal.

Which ONE of the following products released from the ruptured spent fuel element will present the most immediate hazard?

A. Beta radiation from Tritium.

B. Alpha radiation from fission products.

C. Gamma radiation from Iodine and Krypton gases.

D. Gamma radiation from fission and corrosion products.

23. Given the following:

- Unit 1 was operating at 100% power when conditions arose that caused the crew to abandon the Main Control Room.
- The crew has implemented AOP-C.04, "Shutdown from Auxiliary Control Room," and is commencing a unit cooldown.

Which ONE of the following identifies the operation of the Unit 1 Chemical and Volume Control system controls, before evacuating the MCR?

A. Ensure one CCP placed in Pull to Lock.

B. Place both CCP handswitches in Pull to Lock.

C. Ensure total seal injection flow greater than 24 gpm.

D. Ensure RWST to CCP suction valves, LCV-62-135 and LCV-62-136, Open.

24. Given the following:

- Unit-2 has experienced a small break LOCA that resulted in entry into FR-C.1, "Inadequate Core Cooling."
- While performing FR-C.1, the position of pressurizer PORV block valve 2-FCV-68-332 could not be determined from control room indications.
- The Control Building AUO is dispatched to perform EA-201-1, "480 V Board Room Breaker Alignments."

Which ONE of the following identifies:

(1) the action the control room staff will direct the Control Building AUO to perform in accordance with EA-201-1 to restore valve power

and

(2) if the block valve is subsequently stroked after power restoration, what main control indicating lights, if any, would be lit when the valve is in mid-position?

A. (1) Close the block valve breaker locally at 480V Reactor MOV Board 2B1-B.
(2) Red and green valve positon lights <u>will NOT</u> be lit.

B. (1) Transfer 480V Reactor MOV Board 2B1-B control power to alternate.
(2) Red and green valve position lights <u>will</u> be lit.

C. (1) Close the block valve breaker locally at 480V Reactor MOV Board 2B1-B.
(2) Red and green valve positon lights <u>will</u> be lit.

D. (1) Transfer 480V Reactor MOV Board 2B1-B control power to alternate.
(2) Red and green valve position lights <u>will NOT</u> be lit.

25. Given the following:

- Unit 2 is operating at 100%.
- The crew has just entered AOP-R.06, "High RCS Activity" due to a report from chemistry that the activity level has indicated an increase in the last 2 samples.

Which one of the following identifies...

(1) the reason for contacting Chemistry during performance of AOP-R.06

and

(2) the DOSE EQUIVALENT 131 activity value that will require Tech Spec. LCO 3.4.8, "RCS Specific Activity," to be entered?

A. (1) To ensure the Fuel Reliability Assessment Program is implemented.
(2) 0.16 microcuries/gram

B. (1) To recommend letdown alignment for maximizing the cleanup of the RCS.
(2) 0.16 microcuries/gram

C. (1) To recommend letdown alignment for maximizing the cleanup of the RCS.
(2) 0.36 microcuries/gram

D. (1) To ensure the Fuel Reliability Assessment Program is implemented.
(2) 0.36 microcuries/gram

26. Given the following:

- A LOCA on Unit-2 has resulted in entry into E-1 "Loss of Reactor or Secondary Coolant."
- Unit 2 containment conditions are as follows:
    - Containment pressure is 2.9 psig and stable.
    - Lower Containment radiation is 100 R/hr and slowly increasing.
    - Containment sump level is 65% and slowly increasing.

In accordance with 2-FR-0, "Unit 2 Status Trees," which ONE of the following is the required crew response:

A. Continue in E-1 “Loss of Reactor or Secondary Coolant.”

B. Enter FR-Z.1 “High Containment Pressure.”

C. Enter FR-Z.2 “Containment Flooding.”

D. Enter FR-Z.3 “High Containment Radiation.”

27. Given the following plant conditions:

- A large break LOCA has occurred.
- Accumulators have discharged and are isolated.
- ES-1.3, "Transfer to Containment Sump," has been completed.
- Containment sump level is now at 84% and slowly rising.
- FR-Z.2, "Containment Flooding," is in progress.

Which of the following describes;

(1) where the FR-Z.2 required sample is taken,

and

(2) the reason for sampling the containment sump?

	(1)	(2)
A.	RHR system	to determine the level of activity, to allow the TSC to determine if excess sump water can be transferred to tanks outside of containment.
B.	Containment sump	to determine the level of activity, to allow the TSC to determine if excess sump water can be transferred to tanks outside of containment.
C.	RHR system	to ensure shutdown margin is being maintained, since non-borated water has entered the containment sump.
D.	Containment sump	to ensure shutdown margin is being maintained, since non-borated water has entered the containment sump.

28. Given the following:

- With the Unit in Mode 5, the operating crew is preparing to start the #2 Reactor Coolant Pump.
- 1-HS-68-85A, RCP 2 OIL LIFT PUMP 2, has been placed to the START position and the RED light is lit.

Which ONE of the following completes the two statements?

The lift pump must be run for at least _____ before starting of the RCP.

After the Reactor Coolant Pump is started, the Lift Oil pump _____.

A. 60 seconds — must be stopped manually using 1-HS-68-85A after 1 minute

B. 60 seconds — will shutdown automatically after a 1 minute time delay

C. 120 seconds — must be stopped manually using 1-HS-68-85A after 1 minute

D. 120 seconds — will shutdown automatically after a 1 minute time delay

29. Which ONE of the following explains why 1-PCV-62-120, Volume Control Tank H_2 Supply Press Control, is adjusted to maintain Volume Control Tank (VCT) hydrogen pressure between a nominal value of 17 psig and 20 psig when the plant is at power?

A. Ensures adequate NPSH for the CCPs when both pumps are run during pump swap operation.

B. Provides minimum backpressure in CCP miniflow line to prevent excessive flow.

C. Provides minimum backpressure to the RCP #2 seal to ensure adequate flow to #3 seal.

D. Ensures hydrogen concentration in the RCS controlled at 25-35 cc/kg for oxygen scavenging.

30. The RCS is required to be sampled routinely for Chlorides, Flourides and Dissolved Oxygen.

Which ONE of the following is the reason for this required sampling?

A. To provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective actions.

B. To ensure that the long term effects of operating above the steady state limit, but below the transient limit does not adversely effect RCP seal integrity.

C. To reduce the operational dose rates inside containment that would be produced from the activation of dissolved Oxygen, Chlorides and Flourides during power operation.

D. To minimize the adverse effects of continued operation above the limits on the SG tube sheet integrity.

31. Given the following:

- Unit 1 RCS is 230°F
- 1A RHR train is being placed in service per 0-SO-74-1, "Residual Heat Removal System."
- RHR Letdown has been placed in service at maximum flow.
- FCV-63-93, RHR Pump A-A Discharge to Loops 2 and 3 Cold Leg, has just been opened.
- Annunciator "RHR HX A OUTLET TEMPERATURE HIGH," alarms (window E-6 on panel 0-M27-B-A)

Which ONE of the following identifies the valve leaking by that will result in the alarm and the operator action to mitigate in accordance with the Annunciator Response?

	Condition	**Action to mitigate**
A.	FCV-74-16, RHR Hx 1A Outlet Flow Control Valve	Remove RHR Letdown from service.
B.	FCV-74-32, RHR Hx 1A and 1B Bypass Flow Control Valve	Remove RHR Letdown from service.
C.	FCV-74-16, RHR Hx 1A Outlet Flow Control Valve	Increase CCS flow through the 1A-A RHR Heat Exchanger.
D.	FCV-74-32, RHR Hx 1A and 1B Bypass Flow Control Valve	Increase CCS flow through the 1A-A RHR Heat Exchanger.

32. Which ONE of the following identifies the 480v Reactor MOV Boards that supply power to the CCPIT outlet valves, 1-FCV-63-26 and 1-FCV-63-25?

A. 1A1-A and 1B1-B

B. 1A1-A and 1B2-B

C. 1A2-A and 1B1-B

D. 1A2-A and 1B2-B

33. Given the following:

- Unit 1 has experienced a Reactor Trip and Safety Injection from 100% power due to a steam-line break.
- RCS pressure is currently 1850 psig and slowly lowering.
- PRT pressure and level are increasing.
- PRT temperature is constant.

Which ONE of the following is the cause of the changing PRT parameters?

A. A Pressurizer PORV is OPEN.

B. Letdown line relief valve is lifting.

C. RCP seal leakoff flow.

D. Loss of air to the PRT fill valve FCV-68-303.

34. Given the following:

- Unit 1 is operating at 100% power.
- The following alarms are received:
  - "TS-62-78 LTDN HX OUTLET TO DEMIN TEMP HIGH"
  - "LETDOWN HX OUTLET FLOW/TEMP ABNORMAL"
- Letdown Heat Exchanger Outlet Temperature is RISING.
- 1-TCV-62-79, Mixed Bed HI Temp Bypass, has positioned to bypass the letdown de-mineralizers.

Which ONE of the following describes:

(1) the event in progress,

and

(2) the operator action that will be required to mitigate the condition?

A. (1) a leak on the CCS header downstream of the letdown heat exchanger.
(2) Close Letdown Orifice Isolation valves and then close 1-TCV-70-192 to the letdown heat exchanger.

B. (1) a leak on the CCS header downstream of the letdown heat exchanger.
(2) Place 1-HIC-62-78 in Manual and attempt to control temperature.

C. (1) failure of temperature loop TE-62-78, letdown heat exchanger outlet temperature.
(2) Close Letdown Orifice Isolation valves and then close 1-TCV-70-192 to the letdown heat exchanger.

D. (1) failure of temperature loop TE-62-78, letdown heat exchanger outlet temperature.
(2) Place 1-HIC-62-78 in Manual and attempt to control temperature.

35. Given the following:

- Unit 1 is at 100% power.
- VCT pressure is at 18 psig.

Which ONE of the following identifies the location of a CCS leak and the resulting plant condition the leak would cause?

	LEAK LOCATION	CONDITION
A.	RCP Thermal Barrier	TBBP in A-P auto starts
B.	Letdown Heat Exchanger	CCS Rad Monitor rising
C.	RHR 1B-B Heat Exchanger	CCS Surge Tank level rising
D.	Seal Return Heat Exchanger	VCT level dropping

36. Given the following:

- Unit 2 is maintaining 50% power while work is finishing on B MFW pump.
- A plant transient occurs which resulted in PZR pressure dropping to 2150 psig and PZR level lowering to 15%.
- Currently PZR pressure is 2200 psig and PZR level is 30%.

Assuming **NO** operator action, which ONE of the following describes the current status of the PZR heaters, ?

A. All Backup and Control group heaters will be OFF.

B. All Backup and Control group heaters will be ON.

C. All Backup heaters will be ON and Control group D heaters will be OFF.

D. Backup heaters A & B will be OFF and Control group D heaters will be ON.

37. Given the following:

- Unit 1 is operating at 80% power during a plant startup

Assuming that RCS and flux distribution parameters remain on program/target, as power is raised to 100%, which ONE of the following identifies how OTDT and OPDT reactor protection setpoints change?

	OTDT setpoint	**OPDT setpoint**
A.	increase	stay the same
B.	decrease	decrease
C.	decrease	stay the same
D.	stay the same	increase

38. Given the following plant conditions:

- Unit 1 is at 100% power.
- Pressurizer pressure Channel I, 1-PT-68-340, has been removed from service for surveillance testing with its associated bistables tripped.
- Pressurizer pressure Channel IV, 1-PT-68-322, fails high.

Which ONE of the following describes the <u>immediate</u> result of these conditions?

A. Both Reactor trip and Safety Injection occur.
PZR PORV, 1-PCV-68-340 opens; PZR PORV, 1-PCV-68-334 opens.

B. A Reactor trip but **NO** Safety Injection occurs.
PZR PORV, 1-PCV-68-340 opens; PZR PORV, 1-PCV-68-334 remains closed.

C. Both Reactor trip and Safety Injection occur.
PZR PORV, 1-PCV-68-340 remains closed; PZR PORV, 1-PCV-68-334 opens.

D. A Reactor trip but **NO** Safety Injection occurs.
PZR PORV, 1-PCV-68-340 remains closed; PZR PORV, 1-PCV-68-334 remains closed.

39. Given the following plant conditions:

- Reactor power is 100%.
- RWST level instrument 1-LT-63-52 has failed and has been removed from service in accordance with AOP-I.09, "RWST Level Instrument Malfunction."
- The RO notices that RWST level instrument 1-LT-63-50 failed off-scale high.
- All other RWST level indicators (1-LT-63-51, 53) are at 99%.

Which ONE of the following describes the initial impact of this failure?

A. Train A RHR suction auto swapover is disabled, Train B RHR suction auto swapover is available.

B. Train B RHR suction auto swapover is disabled, Train A RHR suction auto swapover is available.

C. Both trains of RHR suction auto swapover are unavailable.

D. Both trains of RHR suction auto swapover are available.

40. Which ONE of the following describes the effect of an increase in containment lower compartment air temperature from 110°F to 130°F over a 10 minute period?

A. Control Rod Drive Mechanism damage.

B. Neutron Detector and/or cable damage.

C. Pressurizer PORV leakage.

D. Pressurizer Safety Valve leakage.

41. Which ONE of the following ice condenser temperatures is within the optimal range in accordance with 0-SO-61-1, "Ice Condenser Cooling" and one of the potential adverse affects of being outside this range?

A. 19°F; excessive concrete expansion

B. 19°F; operation outside technical specification limit

C. 27°F; excessive concrete expansion

D. 27°F; operation outside technical specification limit

42. Given the following plant conditions and time line:

- 1200 - Unit 1 Reactor trip and Safety Injection due to a LOCA.
- 1201 - RCS pressure is 1800 psig and dropping.
- 1205 - Cntmt pressure is 1.5 psig.
- 1205 - Loss of offsite power occurred just as the crew completed the immediate operator actions of E-0, "Reactor Trip or Safety Injection."
- 1206 - Cntmt pressure is 3.1 psig.
- 1206 - RCS pressure is 1400 psig and dropping.

Which ONE of the following describes the status of the Containment Spray (CS) system 2 minutes after the Emergency Diesel Generators restored power to their respective shutdown boards?

A. CS pumps RUNNING; spray header isolation valves CLOSED.

B. CS pumps RUNNING; spray header isolation valves OPEN.

C. CS pumps OFF; spray header isolation valves CLOSED.

D. CS pumps OFF; spray header isolation valves OPEN.

43. Which ONE of the following is correct regarding the logic for MANUAL actuation of a phase B Isolation?

A. Operation of any one of 4 handswitches will actuate both trains.

B. Operation of either 1-HS-30-64A (M-6) or 1-HS-30-68A (M-5) will actuate train A ONLY.

C. Operation of the paired handswitches (M-5 or M-6) operated sequentially will actuate both trains.

D. Operation of the paired handswitches (M-5 or M-6) operated simultaneously will actuate both trains.

44. Given the following plant conditions:

- A plant cooldown is in progress.
- RCS pressure is 1850 psig.
- RCS temperature is 505°F.
- All required actions have been taken for the cooldown in accordance with plant procedures.

An event occurs:

- RCS pressure is 1700 psig and lowering at 10 psi per second.
- SG pressures are 600 psig and lowering at 25 psi per second.
- Containment pressure is 1.2 psig and rising.

Assuming all equipment operates as designed, which ONE of the following identifies the ESF actuation status?

A. Both Safety Injection and Main Steam Line Isolation have occurred.

B. Safety Injection has occurred; Main Steam Line Isolation has NOT.

C. Safety Injection has NOT occurred; Main Steam Line Isolation has.

D. Neither Safety Injection nor Main Steam Isolation have occurred.

45. Given the following:

- Unit 1 was operating at 26% power.
- The #3 SG Main Feedwater Reg valve failed to the closed position.
- Operators tripped the reactor in anticipation of an automatic trip.
- Level in #3 SG dropped to 9% NR, and is recovering.
- Levels in 1, 2, and 4 SGs dropped to 21% NR, and are recovering.
- RCS is currently at 547°F and 2235 psig.

Which ONE of the following identifies the Auxiliary Feedwater (AFW) pumps that would have been automatically started during the event?

A. Motor Driven Pump 1A-A, ONLY.

B. Motor Driven Pump 1B-B, ONLY.

C. Both Motor Driven Pumps, ONLY.

D. All three of the AFW pumps.

46. Given the following conditions:

- Unit 1 is at 90% RTP steady state.
- Loop 2 main feed regulating valve fails full closed over a period of 1 minute.
- All other controls respond as expected.

Assuming **NO** operator action, which ONE of the following alarms will be received FIRST?

A. "LS-3-42D STEAM GEN LVL HIGH - LOW DEVIATION," (M5-A, B7)

B. "LS-3-52D STM GEN LOOP 2 LOW FW FLOW - LOW WATER LEVEL," (M6-B, B1)

C. "FS-3-48B STM GEN LOOP 2 STEAM/FEEDWATER FLOW MISMATCH," (M6-B, B7)

D. "LS-3-156D STM GEN #2 LEVEL LOW," (M3-C, C4)

47. Given the following plant conditions:

- Unit 2 is in Mode 1.
- The TDAFW Pump is tagged out of service.
- A Loss of Feedwater causes a reactor trip.
- Coincident with the trip, Shutdown Board 2B-B de-energizes on fault.

Which ONE of the following describes the SGs that will receive AFW flow and the expected flow rate to those SGs?

A. 1 and 2 SGs being fed at 220 GPM each

B. 1 and 2 SGs being fed at 440 GPM each

C. 3 and 4 SGs being fed at 220 GPM each

D. 3 and 4 SGs being fed at 440 GPM each

48. Given the following;

- A Safety Injection signal on Unit-1
- All shutdown boards are being supplied by their respective Start buses.
- The Control Building AUO has been dispatched to reset the D/G auto start signal(s) per EA-82-1, "Placing D/G's in Standby."

In accordance with EA-82-1, which ONE of the following identifies;

(1) the D/G 43T(L) switches that must be placed in "Test"

and

(2) the condition of the "EMERG START LOCKOUT RELAY," amber light, on the associated 0-M-26 panel <u>after</u> reset?

	D/G 43T(L) switches in Test	**Amber light**
A.	1A and 1B only	Lit
B.	1A and 1B only	Not Lit
C.	1A, 1B, 2A, and 2B	Lit
D.	1A, 1B, 2A, and 2B	Not Lit

49. Given the following:

- Unit 1 operating at 100% power with all system in a normal alignment.

Which ONE of the following would occur if the 125V DC Vital Battery Charger 1-I output breaker tripped open?

A. Annunciator "125V DC VITAL BAT BD I ABNORMAL" would alarm and EI-57-92, Batt BD I AMPS, would be indicating upscale from zero.

B. Annunciator "125V DC VITAL BAT BD I ABNORMAL" would alarm and EI-57-92, Batt BD I AMPS, would be indicating downscale from zero.

C. Annunciator "125 V DC VITAL CHGR I FAILURE OR VITAL BAT I DISCHARGE" would alarm and EI-57-92, Batt BD I AMPS, would be indicating upscale from zero.

D. Annunciator "125 V DC VITAL CHGR I FAILURE OR VITAL BAT I DISCHARGE" would alarm and EI-57-92, Batt BD I AMPS, would be indicating downscale from zero.

50. Given the following:

- The 2A D/G is in service for post maintenance testing and is being loaded to 4.4 MW in accordance with 0-SO-82-3, "Diesel Generator 2A-A."
- Currently the load on the diesel is 2.0 MW.
- The outside AUO has just reported that the exhaust from the 2A D/G is black and estimates it to be 2-3 times more dense than normal.

In accordance with 0-SO-82-3, which ONE of the following identifies the required operator action(s)?

A. Trip the 2A D/G and notify the Site Environmental Manager.

B. The load increase may continue as long as the exhaust smoke density does not get worse.

C. Stop the load increase and notify the Shift Manager to contact Site Environmental Manager.

D. Immediately reduce 2A D/G load to less than 1.6 MW or until the exhaust smoke clears.

51. Unit 1 conditions are as follows:

- The unit has been at 100% power
- Total primary to secondary leakage is 70 gpd
- Identified RCS leakage is 0.18 gpm
- Unidentified RCS leakage is 0.2 gpm
- Pzr level, VCT level, charging flow, and letdown flow are all stable

Which ONE of the following conditions would provide the first indications in the control room of a developing fuel element defect?

A. Annunciator "1-RA-272A UPPR IN CNTMT HI RAD" alarms and a rapidly increasing count rate on 1-RM-90-112A/B/C "Upper Containment Air Monitor."

B. A rapidly increasing count rate on 1-RM-90-119 "Condenser Vacuum Exhaust Monitor" and a rapidly increasing count rate on 1-RM-90-112A/B/C "Upper Containment Air Monitor."

C. A slowly increasing count rate on 1-RM-90-130A and -131A "Containment Purge Exhaust Monitors" and Annunciator "1-RA-272A UPPR IN CNTMT HI RAD" alarms.

D. A slowly increasing count rate on 1-RM-90-106A/B "Lower Containment Air Monitor" and a slowly increasing count rate on 1-RM-90-119 "Condenser Vacuum Exhaust Monitor."

52. Given the following plant alarms:

- 0-RA-90-125A, "MAIN CNTRL RM INTAKE MON HIGH RAD"
- 0-RA-90-126A, "MAIN CNTRL RM INTAKE MON HIGH RAD"

Which ONE of the following describes the Main Control Room ventilation alignment?

The MCR is maintained at a _____

A. positive pressure by the Main Control Room Air Handling Units.

B. negative pressure by the Main Control Room Air Handling Units.

C. a positive pressure by the Control Building Emergency Air Pressurization Fans.

D. a negative pressure by the Control Building Emergency Air Pressurization Fans.

53. Which ONE of the following identifies the 480v board that supplies power for 0-FCV-67-152, CCS Heat Exchanger 0B1 & 0B2 Discharge Valve?

A. 1B1-B Reactor MOV board

B. 2B2-B Reactor MOV Board

C. 1B1-B Shutdown Board

D. 2B1-B Shutdown Board

54. Given the following plant conditions:

- The Unit 1 is at 100% power.
- A leak develops on the Control Air system.
- Control air pressure is 72 psig and DECREASING.

Which ONE of the following identifies the system response that should have occurred to maintain Train A Essential Air Header pressure?

A. 1-FCV-32-110, Reactor Building Non-essential air valve, goes closed.

B. 1-FCV-32-82, Train A Control Air Supply valve, automatically closes.

C. 0-PCV-33-4, Service Air Receiver isolation valve, goes open.

D. Auxiliary air compressor A-A starts and loads.

55. Given the following:

- Unit 1 is in Mode 6.
- Reactor vessel head lift is in progress.
- Steady buzzing horn sounds in containment.

Which ONE of the following describes the Event and the Immediate Action that is required to be implemented?

	Event	**Immediate Action**
A.	Polar Crane malfunction	Place reactor vessel head on stand
B.	Polar Crane malfunction	Stop reactor vessel head lift
C.	Source Range High Flux Level at Shutdown Alarm.	Evacuate Containment
D.	Source Range High Flux Level at Shutdown Alarm.	Reset Shutdown Monitor

56. Which ONE of the following is the primary source of power to the Rod Control Logic Cabinets?

A. Rectified AC from the Rod Drive MG output.

B. Rectified AC from 120 VAC Instrument Bus.

C. 125V DC stepped down from station battery boards.

D. 250V DC stepped down from station battery boards.

57. Given the following plant conditions:

- Unit 2 is responding to a small break LOCA in ES-1.1, "SI Termination."
- RCPs have been tripped.
- Pressurizer level is steady.
- Only one train of ECCS is injecting.
- Loop 1 temperatures are representative of all 4 loops.
- Steam generator pressures are the same as steam header pressure.

Which ONE of the following sets of plant parameters is indicative of natural circulation occurring in the RCS?

		Time		
	0200	**0205**	**0210**	**0215**
A. Steam Header Pressure (psig)	1042	1009	976	945
RC System Pressure (psig)	1968	1964	1960	1958
Loop 1 T-hot (°F)	579	574	569	564
Loop 1 T-cold (°F)	548	544	540	536
B. Steam Header Pressure (psig)	1042	1009	976	945
RC System Pressure (psig)	1968	1972	1975	1981
Loop 1 T-hot (°F)	579	582	585	595
Loop 1 T-cold (°F)	548	544	540	536
C. Steam Header Pressure (psig)	1042	1047	1050	1052
RC System Pressure (psig)	1968	1964	1960	1958
Loop 1 T-hot (°F)	579	574	569	564
Loop 1 T-cold (°F)	570	571	570	572
D. Steam Header Pressure (psig)	1042	1047	1050	1052
RC System Pressure (psig)	1968	1972	1975	1981
Loop 1 T-hot (°F)	579	582	585	595
Loop 1 T-cold (°F)	548	544	540	536

58. Given the following:

- Unit 2 operating at 10% reactor power.
- **CONDITION 1**: Two hours following a reactor trip and trip of all RCPs.
- **CONDITION 2**: Two hours following a reactor trip with all RCPs running.

Which ONE of the following identifies the correct combination of expected indications for incore thermocouple temperatures (TCs) and RCS cold leg temperatures (T_{cold}) for the stated conditions?

	CONDITION 1 (No RCPs)	**CONDITION 2** (ALL RCPs)
A.	TCs only slightly above T_{cold}	TCs several degrees greater than T_{cold}
B.	TCs only slightly above T_{cold}	TCs only slightly above T_{cold}
C.	TCs several degrees greater than T_{cold}	TCs several degrees greater than T_{cold}
D.	TCs several degrees greater than T_{cold}	TCs only slightly above T_{cold}

59. Given the following:

- A LOCA has occurred on Unit 1.
- One train of EGTS has been removed from service in accordance with E-1, "Loss of Reactor or Secondary Coolant."

Which ONE of the following identifies ...

(1) the purpose of the charcoal filter on the suction side of the EGTS cleanup fan,

and

(2) why flow is maintained through the EGTS Filter removed from service?

A. (1) To remove iodine and other halogen gases.
(2) To remove the heat generated in the charcoal bed.

B. (1) To remove iodine and other halogen gases.
(2) To prevent corrosive carbolic acid build-up in the charcoal bed.

C. (1) To remove Cesium and other particulates.
(2) To remove the heat generated in the charcoal bed.

D. (1) To remove Cesium and other particulates.
(2) To prevent corrosive carbolic acid build-up in the charcoal bed.

60. Given the following:

- Unit 1 has experienced a Large break LOCA.
- FR-C.1,"Inadequate Core Cooling," is being implemented.
- Containment pressure is 10 psig and slowly lowering.
- Containment hydrogen concentration is 6.5% and slowly rising.

Which ONE of following identifies the Hydrogen Recombiner operation?

Hydrogen recombiner operation....

A. is not allowed because of the operation of containment spray.

B. is allowed provided the hydrogen igniters have previously been placed in service.

C. is allowed however the maximum power setting is limited due to elevated containment pressure.

D. is not allowed because it may cause a sudden rise in containment pressure that may challenge containment Integrity.

61. Which ONE of the following describes the function of the Unit 2 Manipulator Crane SENSOTEC load system interlock, SEN 10H, "heavy assembly" overload limit switch?

A. Prevents the gripper from disengaging at any bridge location.

B. Stops upward motion of the hoist and illuminates the overload light.

C. Acts as a backup to the SEN 9H, "light assembly" overload limit switch if it malfunctions.

D. Stops all motion of the hoist, up or down, illuminates the overload light until the JOG pushbutton is depressed.

62. Technical Specifications require two (2) Residual Heat Removal (RHR) loops to be operable during cold shutdown. Certain equipment may be substituted for one of the RHR loops.

Which ONE of the following conditions will satisfy this substitution requirement?

A. Four filled RCS loops with 2 steam generators with levels greater than or equal to 10% (wide range).

B. Four filled RCS loops with 1 SI pump and RWST level > 50%.

C. Four filled RCS loops with 2 operable RCP's and 1 operable AFW Pump with CST level > 50%.

D. Four filled RCS loops with 1 operable RCP and 1 SI Pump.

63. Given the following:

- Unit 1 heatup following a MODE 5 outage is being performed and the crew is preparing to establish vacuum in the main condenser.

Which ONE of the following identifies when ODCM 1/2.1.2 "Radioactive Gaseous Effluent Monitoring Instrumentation" requirements for the condenser vacuum exhaust must first be met?

A. When the first vacuum pump is started to begin pulling vacuum.

B. When "C-9 CONDENSER INTERLOCK" permissive window is lit.

C. When "PS-2-7B CONDENSER VACUUM LOW" annunciator window clears.

D. When the turbine throttle valves are first opened to roll the turbine.

64. Which ONE of the following identifies;

(1) the normal pressure range for Waste Gas Vent Header pressure

and

(2) how pressure is prevented from decreasing below minimum while a Waste Gas compressor is running after being manually started?

A. (1) 0.5 psig - 2.0 psig
(2) A pressure control valve on the discharge of the compressor throttles in the closed direction as the vent header pressure drops.

B. (1) 0.5 psig - 2.0 psig
(2) A pressure control valve opens to recirculate the compressor discharge back to the suction as the vent header pressure drops.

C. (1) 0.2 psig - 5.0 psig
(2) A pressure control valve on the discharge of the compressor throttles in the closed direction as the vent header pressure drops.

D. (1) 0.2 psig - 5.0 psig
(2) A pressure control valve opens to recirculate the compressor discharge back to the suction as the vent header pressure drops.

65. Given the following:

- Unit 2 is operating at 100% power when 2A Condenser Circulating Water Pump trips.
- Annunciator "PS-2-7B CONDENSER VACUUM LOW" alarms.
- Operators implement AOP-S.02, "Loss of Condenser Vacuum."

In accordance with AOP-S.02, which ONE of the following identifies...

(1) the relationship between turbine trip and steam dump valve condenser interlock,

and

(2) the lowest condenser pressure, that if exceeded will require the reactor to be immediately tripped?

A. (1) Turbine will automatically trip before the Steam Dump valve condenser interlock will be lost.
(2) 3.5 psia

B. (1) Turbine will automatically trip before the Steam Dump valve condenser interlock will be lost.
(2) 5.4 psia

C. (1) Steam Dump valve condenser interlock will be lost before the Turbine will automatically trip
(2) 3.5 psia

D. (1) Steam Dump valve condenser interlock will be lost before the Turbine will automatically trip
(2) 5.4 psia

66. Given the following:

- Unit 1 is starting up after a refueling outage.
- The Condenser Circulating Water (CCW) system is being started up.
- At 0800, CCW pump 1A was started and immediately secured due to a water box cover leaking.
- At 0810, CCW pump 1A was restarted and reached rated speed but subsequently tripped.
- At 0815, the cause of the trip was identified and repaired.

Which ONE of the following identifies the earliest time that CCW pump 1A could be restarted?

A. 0815

B. 0830

C. 0855

D. 0900

67. Given the following:

- A plant startup on Unit 1 is in progress at 18% power.
- Turbine load is ~125 MW.
- A malfunction of the "A" feed pump control oil system causes feed pump speed to lower.
- Feedwater discharge pressure decreases below SG pressure.
- Immediate operator actions to restore feedwater pressure to normal are NOT successful.

In accordance with AOP-S.01, "Main Feedwater Malfunctions," which ONE of the following describes the required operator action(s)?

A. Trip the reactor.

B. Manually start all AFW pumps.

C. Manually start all AFW pumps and trip the "A" main feedwater pump.

D. Reduce turbine load until feedwater flow is greater than steam flow.

68. Given the following Unit 2 plant conditions:

- Two AUOs were performing an alignment on the 2A-A Safety Injection Pump.
- The independent verifier identified a valve that was not in its required position.

Which ONE of the following describes the required action(s) that must be taken by the independent verifier?

A. Correctly position the valve, then notify the U-2 SRO of the discrepancy.

B. Stop performance of the valve checklist and immediately notify the U-2 SRO for determination of proper corrective actions.

C. Correctly position the valve, then have an additional operator independently verify the valve is in the proper position.

D. Document the valve position discrepancy on the valve checklist, then continue with the independent verification of the remaining valves on the checklist. Notify the U-2 SRO when complete.

69. During a prejob brief, an operator discovers a procedure step that meets the "CRITICAL STEP" criteria listed in SPP-2.2, "Administration of Site Technical Procedures," however it is not identified as a "CRITICAL STEP."

Which ONE of the following is the minimum action required to allow the procedure to be used at this time?

A. Process a One Time Only change.

B. Process an Urgent Procedure change.

C. Flag the step to identify it as critical.

D. Process a Minor Editorial change.

70. Given the following plant conditions:

- Unit 1 at 100% power.
- Unit 2 core off-load is complete.
- Fuel shuffle in the Spent Fuel Pit is in progress.
- "0-RA-90-102A FUEL POOL RAD MONITOR HI RAD" alarm sounds.
- Radiation level indicated on 0-RM-90-102 is 60 mr/hr and increasing.
- Radiation level indicated on 0-RM-90-103 is 30 mr/hr and increasing.

In accordance with the alarm response procedure, which ONE of the following describes the required operator action(s), if any?

A. No operator action is required.

B. Announce on the PA System to evacuate the Auxiliary Building and dispatch maintenance personnel to close the U-2 Equipment Hatch.

C. Verify the Auxiliary Building General Supply and Exhaust Fans are shutdown; manually actuate BOTH A & B-Train Auxiliary Building Isolation.

D. Verify the Auxiliary Building General Supply and Exhaust Fans and Fuel Handling Exhaust Fans are shutdown; manually actuate ONLY B-Train Auxiliary Building Isolation.

71. Given the following plant conditions:

- Unit 2 is steady-state at 100% power
- All systems are aligned normally for Mode 1

Which ONE of the following radiation monitors has Operability requirements by a Mode 1 Technical Specification LCO?

A. 0-RM-90-135, "MCR AREA RADMON"

B. 2-RM-90-274, "LOWER CONTAINMENT POST ACCIDENT AREA MONITOR-HI RNGE"

C. 2-RM-90-256, "CONDR VAC EXH HI RNGE MONITOR"

D. 2-RM-90-1, "SPENT FUEL PIT AREA RADMON"

72. Given the following plant conditions:

- A LOCA has occurred and a Site Area Emergency has been declared.
- The TSC and OSC have been activated.
- To prevent damage to equipment needed for protection of the public, it is recommended that an individual make an entry into the 1A-A Safety Injection Pump Room 1A.
- Projected dose rate in the pump room is 1.0×10^5 mR/hr.
- Duration of the exposure is expected to be 6 minutes.

Which ONE of the following individuals must authorize this exposure?

A. Radcon Manager

B. Site Emergency Director

C. Plant Manager

D. Site Vice President

73. Which ONE of the following completes both of the following statements in accordance with EPIP-8, Personnel Accountability & Evacuation?

During a _____ , the "2-Person-Line-of-Sight Rule" is required.

The "2-Person-Line-of-Sight Rule" requires that _____ .

A. General Emergency;
all persons in vital areas must remain in visual contact with another person and the two persons also must possess similar skills or knowledge.

B. General Emergency;
all persons in vital areas must remain in visual contact with another person but the two persons do **NOT** have to possess similar skills or knowledge.

C. Credible Insider Threat;
all persons in vital areas must remain in visual contact with another person and the two persons also must possess similar skills or knowledge.

D. Credible Insider Threat;
all persons in vital areas must remain in visual contact with another person but the two persons do **NOT** have to possess similar skills or knowledge.

74. Given the following plant conditions:

- Unit 2 is operating at 100% RTP.
- Two hours after shift change the OATC notices all lit channel B annunciator windows change to the dark condition.
- The "B" channel main controller card and "B" train scanner boards show no failures when tested using the ADDS terminal per 0-SO-55-1, "Annunciator System."

In accordance with 0-SO-55-1, which ONE of the devices below, if any, could be used to monitor "B" Train annunciator channel?

A. The Unit-2 annunciator printer.

B. The CRT located on the Shift Manager's desk.

C. The CRT located on the Unit 2 UO work station.

D. There is no alternate monitoring device for the "B" Train annunciator windows.

75. The operating crew is performing an RCS cooldown at maximum rate in accordance with E-3, "Steam Generator Tube Rupture." During this cooldown, the RCS pressure decreases to 1150 psig.

Which ONE of the following identifies the strategy for Reactor Coolant Pump trip criteria?

A. The RCP trip criteria does not apply during the operator initiated cooldown.

B. The RCPs should be tripped whenever RCS pressure decreases to less than 1250 psig.

C. The RCPs should be tripped when RCS pressure is less than 1250 psig and a Charging pump is verified running.

D. The RCP trip criteria does not apply anytime during performance of E-3.

76. Given the following condition:

- Unit 1 is operating at 100% power.
- Pressurizer pressure drops rapidly resulting in a low pressure SI.
- The reactor can NOT be tripped manually from the MCR.
- While performing FR-S.1 "Nuclear Power Generation / ATWS," immediate operator actions, the CRO places Turbine Trip HS-47-24 to the TRIP position.

Which ONE of the following identifies...

(1) The direction HS-47-24 is rotated to trip the turbine and the expected light indication that results.

and

(2) When ES-0.5, "Equipment Verifications," will be first performed?

A. (1) The handswitch is rotated counterclockwise and the red light illuminates.
(2) ES-0.5 would be performed in parallel with the performance of FR-S.1.

B. (1) The handswitch is rotated clockwise and the green light illuminates.
(2) ES-0.5 would be performed in parallel with the performance of FR-S.1.

C. (1) The handswitch is rotated counterclockwise and the red light illuminates.
(2) ES-0.5 would be performed after the transition was made to E-0, "Reactor Trip or Safety Injection."

D. (1) The handswitch is rotated clockwise and the green light illuminates.
(2) ES-0.5 would be performed after the transition was made to E-0, "Reactor Trip or Safety Injection."

77. Given the following:

- A steam generator tube rupture is in progress on Unit 1.
- The Chemistry Lab has confirmed that #1 SG is ruptured.
- The crew is implementing E-3, "Steam Generator Tube Rupture."

According to Technical Specification bases, which ONE of the following actions directed by E-3, requires entry into a Technical Specification Action statement?

A. Closing the #1 SG MSIV.

B. Blocking the Low Steamline Pressure SI.

C. Closing the TDAFW pump steam supply valve from the #1 SG.

D. Cooling down to the target temperature at a rate that exceeds 100°F/ hr.

78. Given the following:

- Unit 2 was operating at 100% power when a loss of main feedwater occurred.
- An automatic trip has occurred.
- TDAFW pump was tagged out of service at the time of the trip.
- The crew has transitioned to ES-0.1, "Reactor Trip Response," and is implementing FR-H.5, "Steam Generator Low Level."
- Total auxiliary feedwater flow currently is 600 gpm.

In accordance with SPP-3.5, "Regulatory Reporting Requirements," which ONE of the following identifies both...

(1) the TVA internal notification(s) required to be made directly by the Shift Manager

and

(2) the maximum time allowed for making the first required notification to the NRC?

A. (1) Site Operations Management, ONLY
(2) 4 hours

B. (1) Site Operations Management, ONLY
(2) 8 hours

C. (1) Site Operations Management AND Duty Plant Manager
(2) 4 hours

D. (1) Site Operations Management AND Duty Plant Manager
(2) 8 hours

79. Given the following:

- A loss of offsite power resulted in Unit 1 only entry into ECA-0.0, "Loss Of All AC Power."

Present plant conditions include the following:

- Core Exit TCs - 592°F.
- Highest loop T-hot indication is 590°F.
- RCS wide range pressure is 2085 psig.
- Pressurizer level is 12% and stable.
- Containment pressure stabilized at 0.9 psig.
- 1B DG has been manually started and has energized 6.9 kv shutdown board 1B.
- ECA-0.0, Appendix A, "Locking Out Shutdown Boards Loads" has been completed.

Which of the following identifies:

(1) the recovery procedure that Unit 1 will utilize

and

(2) when FR procedures are required to be implemented?

A. (1) ECA-0.2 "Recovery From Loss Of All AC Power With SI Required."

(2) When directed by ECA-0.2.

B. (1) ECA-0.2 "Recovery From Loss Of All AC Power With SI Required."

(2) Upon transition out of ECA-0.0.

C. (1) ECA-0.1 "Recovery From Loss Of All AC Power Without SI Required."

(2) When directed by ECA-0.1.

D. (1) ECA-0.1 "Recovery From Loss Of All AC Power Without SI Required."

(2) Upon transition out of ECA-0.0.

80. Given the following:

- A loss of all offsite power has occurred.
- 2A 6.9kV shutdown board is energized by its respective diesel generator.
- The other 6.9kV shutdown boards have no power.
- Offsite power restoration is estimated to be complete in 5 hours.
- The Unit 1 US is directing unit response per ECA-0.0, "Loss of All AC Power."

Which ONE of the following identifies:

(1) required actions to shed DC loads in accordance with ECA-0.0,

and

(2) the basis for leaving the turbine emergency oil pump in service for 3 hours when shedding 250V DC loads?

Note:
EA-250-1, "Load Shed of Vital Loads After Station Blackout"
EA-250-2, "Load Shed of 250V DC Loads After Station Blackout"

A. (1) Perform EA-250-1, ONLY.
(2) To prevent potential for a fire or explosion due to hydrogen loss from the main generators.

B. (1) Perform EA-250-2, ONLY.
(2) To ensure turbine is at zero speed and sufficient turbine heat load has been dissipated from the main turbines.

C. (1) Perform BOTH EA-250-1 and EA-250-2.
(2) To prevent potential for a fire or explosion due to hydrogen loss from the main generators.

D. (1) Perform BOTH EA-250-1 and EA-250-2.
(2) To ensure turbine is at zero speed and sufficient turbine heat load has been dissipated from the main turbines.

81. Given the following:

- Both Units at 100% power.
- All electrical boards are in a normal alignment.
- A disturbance on the electrical grid causes the 161 KV Switchyard voltage to start dropping.
- During the transient, operators must place the "X" winding load tap changer for CSST "C" to MANUAL at the 2R position to maintain the 2B Start bus voltage within limits.
- 161 KV switchyard voltage stabilized at 164.3 KV.

Which ONE of the following identifies both...

(1) the minimum post-accident switchyard voltage necessary to meet design basis requirements for engineered safety features for a normal Sequoyah load alignment,

and

(2) the Operability impact of the stated conditions?

A. (1) 153 KV.
(2) One source of Off Site power must be declared INOPERABLE.

B. (1) 159 KV.
(2) Both sources of Off Site power remain OPERABLE.

C. (1) 153 KV.
(2) Both sources of Off Site power remain OPERABLE.

D. (1) 159 KV.
(2) One source of Off Site power must be declared INOPERABLE.

82. Given the following plant conditions:

- Unit 1 at 95% power when the OATC observes the control rods continuously stepping out at 8 steps/min.
- Auctioneered High Tave is observed to be 575°F.

Which ONE of the following are...

(1) indications that are consistent for this condition

and

(2) the required procedural guidance?

Note: FCV-62-138, Emergency Boration Flow Control Valve

A. (1) Red light on handswitch for FCV-62-138 LIT with NO flow indicated on emergency borate flow indicator FI-62-137A.

(2) Place rod control selector switch to MAN and maintain Tavg within 1°F of Tref in accordance with AOP-C.01, "Rod Control System Malfunction."

B. (1) Red light on handswitch for FCV-62-138 LIT with flow indicated on emergency borate flow indicator FI-62-137A.

(2) Manually close FCV-62-138, and reduce turbine load as necessary to maintain Tavg within 3°F of Tref, in accordance with AOP-C.02, "Uncontrolled RCS Boron Concentration Changes."

C. (1) Red and Green lights on handswitch for FCV-62-138 on Panel M-6 LIT with flow indicated on emergency borate flow indicator FI-62-137A.

(2) Place rod control selector switch to MAN and maintain Tavg within 1°F of Tref in accordance with AOP-C.01, "Rod Control System Malfunction."

D. (1) Red and Green lights on handswitch for FCV-62-138 on Panel M-6 LIT with NO flow indicated on emergency borate flow indicator FI-62-137A.

(2) Manually close FCV-62-138, and reduce turbine load as necessary to maintain Tavg within 3°F of Tref, in accordance with AOP-C.02, "Uncontrolled RCS Boron Concentration Changes."

83. Given the following:

- Both units are operating at 100% power
- A LOCA occurs on Unit 1
- Unit 2 remains at 100% power
- During the performance of E-1, "Loss of Primary or Secondary Coolant," the STA notes that CNMT rad levels are 110 R/hr.

Which ONE of the following identifies both;

(1) the expected alignment of the Emergency Gas Treatment System (EGTS) 20 minutes after the initiation of LOCA

and

(2) the required Technical Specification action for Unit 2 ?

A. (1) Both trains of EGTS are in service
(2) LCO 3.6.1.8, Emergency Gas Treatment System, EGTS, Cleanup Subsystem

B. (1) Both trains of EGTS are in service
(2) LCO 3.0.3

C. (1) Only ONE train of EGTS is in service, the other train in Standby
(2) LCO 3.6.1.8, Emergency Gas Treatment System, EGTS, Cleanup Subsystem

D. (1) Only ONE train of EGTS is in service, the other train in Standby
(2) LCO 3.0.3

84. Given the following plant conditions:

- Unit 1 is at 100% power.
- Unit 2 is in Mode 6 with preparations being made to reload the core.
- 0-RM-90-103, "Spent Fuel Pit RadMon," is out of service for maintenance with high rad relays removed. Train B rad monitor block switch 0-HS -90-136A2 is positioned off and pushed-in.
- As part of performing the Functional Test for 0-RM-90-102, "Spent Fuel Pit RadMon," a source check will be performed. Train A rad monitor block switch 0-HS -90-136A1 is positioned to 0-102 and pulled out.
- When the source check is performed 0-RM-90-102 fails to respond.

Which ONE of the following identifies...

(1) the status of the 2 annunciator windows on 0-M-12D listed below:

"0-HS-90-136A1 HIGH RAD IN CNMT INPUT TO TR A OF SSPS BLOCKED"
"0-HS-90-136A2 HIGH RAD IN CNMT INPUT TO TR B OF SSPS BLOCKED"

and

(2) how the Tech Specs LCOs listed below will be applied on Unit 2?

LCO 3.3.3.1, Radiation Monitoring Instrumentation
LCO 3.9.12, Auxiliary Building Gas Treatment System.

(REFERENCE PROVIDED)

A. (1) ONLY, 0-HS-90-136A1 HIGH RAD IN CNMT INPUT TO TR A OF SSPS BLOCKED will be LIT
(2) ONLY one of the LCO's will be entered.

B. (1) ONLY, 0-HS-90-136A1 HIGH RAD IN CNMT INPUT TO TR A OF SSPS BLOCKED will be LIT
(2) BOTH of the LCO's will be entered.

C. (1) BOTH of the listed annunciator windows will be LIT.
(2) ONLY one of the LCO's will be entered.

D. (1) BOTH of the listed annunciator windows will be LIT.
(2) BOTH of the LCO's will be entered.

85. Given the following:

- Unit 1 is at 100% power.
- The local leak rate test on the lower containment air lock test performed following a containment entry was **NOT** satisfactory.
- Plant Engineering has just reported that 0-SI-SLT-000-160, "Primary Containment Total Leak Rate," has just been completed.
- System Engineering reports that Unit 1 overall containment leakage rate acceptance criteria has been exceeded.

Which ONE of the following identifies:

(1) the <u>most</u> limiting Tech Spec LCO action time for the condition described

and

(2) the Tech Spec basis for the maximum allowed total containment leakage (L_a)?

(REFERENCE PROVIDED)

A. (1) 1 hour
   (2) To prevent exceeding the design capability of the ABGTS

B. (1) 24 hours
   (2) To prevent exceeding the design capability of the ABGTS

C. (1) 1 hour
   (2) To prevent exceeding 10CFR100 limits at the site boundary

D. (1) 24 hours
   (2) To prevent exceeding 10CFR100 limits at the site boundary

86. Given the following:

- Unit 1 is operating at 54% power in accordance with GO-5, Section 5.1, "Power Ascension From 30% to 100%," following a forced outage.
- Power Range Instrument N-41 has been removed from service after failing and the associated bistables have been placed in the tripped condition.
- The operating crew determines the Channel II, P-9 interlock, has failed to actuate.

Which ONE of the following identifies both...

(1) the affect of the failures on the power ascension

and

(2) whether a turbine trip would cause an automatic reactor trip?

A. (1) The power ascension can continue using GO-5, Section 5.1.
(2) NO.

B. (1) The power ascension can continue using GO-5, Section 5.1.
(2) YES.

C. (1) Power must be reduced to less than P-9 using GO-5, Section 5.3, "Power Reduction From 100% to 30%."
(2) NO.

D. (1) Power must be reduced to less than P-9 using GO-5, Section 5.3, "Power Reduction From 100% to 30%."
(2) YES.

87. Given the following conditions:

- Unit 1 is operating at 100% power when the following annunciator alarms on 1-M-30:

"1-RA-421A MN STM LN HI RAD"

The CRO reports the following Steam Line Radiation monitor readings:

	Loop 1	Loop 2	Loop 3	Loop 4
mr/hr	9.35E-4	9.95E-3	8.93E-4	1.12E-3

- Pressurizer level is dropping rapidly.
- RCS activity is normal for a core with no fuel leaks.
- The SRO directs a reactor trip and safety injection to be initiated.
- When ready to isolate the affected steam generator, all 4 MSIVs fail to close and subsequent actions are unsuccessful in closing MSIV's.
- RWST level is 75% and slowly lowering.

Which ONE of the following identifies...

(1) the steam generator that requires lower feed water flow to maintain level at setpoint prior to the reactor trip.

and

(2) the procedure transition required due to the failure of the MSIVs to close?

Steam Generator	Procedure
A. Loop 2	ECA 3.1, "SGTR and LOCA - Subcooled Recovery"
B. Loop 2	ECA 3.2, "SGTR and LOCA - Saturated Recovery"
C. Loop 4	ECA 3.1, "SGTR and LOCA - Subcooled Recovery"
D. Loop 4	ECA 3.2, "SGTR and LOCA - Saturated Recovery"

88. Given the following plant conditions:

- Both Units operating at 100% power.
- ERCW system in normal alignment.
- The following 0-XA-55-27A panel annunciators are LIT:
  - "UNIT 1 HEADER A PRESSURE LOW".
  - "UNIT 2 HEADER A PRESSURE LOW".
  - "PUMP J-A DISCH PRESS LOW".
  - "PUMP Q-A DISCH PRESS LOW".
- The following 1-XA-55-15B panel annunciator is LIT:
  - "ERCW DECK SUMP PUMP A RUNNING".
- ERCW headers 1A and 2A are indicating LOW flow.
- The crew implements AOP-M.01, "Loss of Essential Raw Cooling Water".

Which ONE of the following identifies the section of AOP-M.01 to be implemented for the conditions and a mitigating action directed to be taken in response to the conditions?

A. Section 2.8, "Supply Header 1A/2A Rupture in Yard Area";
Stop and Lockout out all A Train ERCW pumps.

B. Section 2.8, "Supply Header 1A/2A Rupture in Yard Area";
Start additional ERCW pumps to maintain header pressure.

C. Section 2.10, "Supply Header A Rupture Upstream of Strainer Inlet Valves OR Loss of Train A ERCW";
Stop and Lockout out all A Train ERCW pumps.

D. Section 2.10, "Supply Header A Rupture Upstream of Strainer Inlet Valves OR Loss of Train A ERCW";
Start additional ERCW pumps to maintain header pressure.

89. Given the following conditions:

- Both units are at 100% power when Control Air pressure begins to drop.
- AOP-M.02, "Loss of Control Air," Section 2.2, "Loss of Nonessential Control Air in MODE 1, 2, or 3," is currently being implemented.
- AUO sent to check Auxiliary Air System reports that both Aux Air compressors are running and loaded but that there is no air passing through the Train-A air dryers.
- Air pressures on 1-M-15 indicate:
  "0-PI-32-104A, AUX CONT AIR HDR A PRESS" - 59 psig and dropping
  "0-PI-32-105A, AUX CONT AIR HDR B PRESS" - 77 psig and rising
  "0-PI-32-200, CONT AIR HDR PRESS" - 68 psig and dropping
  "0-PI-33-199, SERV AIR HDR PRESS" - 40 psig and dropping

Which ONE of the following identifies..

(1) the action required by AOP-M.02

and

(2) the applicable Tech Spec entry if the action taken is **NOT** successful in restoring "A" Train Aux Air header pressure?

A. (1) Bypass the Train-A Aux Air Dryers.
(2) Enter T.S. 3.7.1.2.a for one train of AFW INOPERABLE.

B. (1) Bypass the Train-A Aux Air Dryers.
(2) Enter T.S. 3.7.1.2.b for two trains of AFW INOPERABLE.

C. (1) Open 0-FCV-32-82, Aux Cmpsr A-A Aux Bldg Isol.
(2) Enter T.S. 3.7.1.2.a for one train of AFW INOPERABLE.

D. (1) Open 0-FCV-32-82, Aux Cmpsr A-A Aux Bldg Isol.
(2) Enter T.S. 3.7.1.2.b for two trains of AFW INOPERABLE.

90. Given the following:

- Unit 1 is at 100% power.
- A LOCA occurred inside containment.
- The crew has just implemented E-1, "Loss of Reactor or Secondary Coolant."
- The STA has completed the initial performance of the status trees and reports the highest priority path exists on the CONTAINMENT status tree.
- Containment conditions are as follows:
  - Pressure is 2.6 psig and lowering.
  - Upper containment Rad Monitors read 85 R/hr.
  - Lower containment Rad Monitors read 125 R/hr.
  - Containment Sump Level is 58%.

Based on the above conditions, which ONE of the choices below completes the following sentence?

The Unit Supervisor ...

A. is required to IMMEDIATELY implement and complete FR-Z.2, "Containment Flooding," then transition back to E-1.

B. will acknowledge entry criteria for FR-Z.2, "Containment Flooding," is met but entry into the FR is optional.

C. is required to IMMEDIATELY implement and complete FR-Z.3, "High Containment Radiation," then transition back to E-1.

D. will acknowledge entry criteria for FR-Z.3, "High Containment Radiation," is met but entry into the FR is optional.

91. Given the following:

- Unit 1 tripped from 100% due to a small break LOCA.
- While implementing E-1, "Loss of Reactor or Secondary Coolant," the following data is reported by the crew:
- RCS pressure 1200 psig slowly lowering.
- CETCs are 500°F and slowly lowering.
- CNMT pressure 2.0 psig.
- CNMT temperature 215°F.
- CNMT hydrogen concentration has just been confirmed at 4.2%.

- The crew is implementing EA-268-1, "Placing Hydrogen Recombiners In Service."

Which ONE of the following identifies:

(1) the parameter used, in accordance with EA-268-1, to adjust the hydrogen recombiner power setting?

and

(2) the REP classification that would be required for the conditions described?

(REFERENCE PROVIDED)

A. (1) Containment humidity
(2) Site Area Emergency

B. (1) Containment humidity
(2) Alert

C. (1) Containment pressure
(2) Alert

D. (1) Containment pressure
(2) Site Area Emergency

92. Given the following:

- At **1330** a liquid radioactive release was commenced from the Monitor Tank to the cooling tower blowdown.
- At **1450**, the following alarm is received:

  0-RA-90-122B WDS LIQ EFF MON INSTR MALFUNC

- The radwaste AUO reports that 0-RCV-77-43, Liquid Radwaste Isolation Valve, is OPEN.
- Upon further investigation it is determined that 0-RA-90-122 has had no sample flow since **1345** and should have alarmed at that time.
- A subsequent grab sample indicated release activity exceeds 20 times the 10CFR20 limit.

Which ONE of the following identifies:

(1) If the current condition of 0-RCV-77-43 is correct for these conditions.

and

(2) Whether NRC notification is required in accordance with SPP-3.5, "Regulatory Reporting Requirements."

A. (1) Yes 0-RCV-77-43 is in the correct position.
(2) Yes notification is required.

B. (1) No 0-RCV-77-43 should be CLOSED.
(2) Yes notification is required.

C. (1) Yes 0-RCV-77-43 is in the correct position.
(2) Notification is NOT required.

D. (1) No 0-RCV-77-43 should be CLOSED.
(2) Notification is NOT required.

93. Given the following plant conditions:

- A release of Waste Gas Tank "B" is in progress to the Unit 2 stack with 2-RM-90-400, "Unit 2 Shield Building Rad Monitor" and 0-RM-90-118, "Waste Gas Effluent Rad Monitor" are both Operable.
- Power is lost to 0-RM-90-118.

Which of the following identifies;

(1) the affect the loss of power will have on the release,

and

(2) the requirement to allow any additional release of the tank with radiation monitor 0-RM-90-118 remaining out of service?

A. (1) The release will automatically terminate.

(2) The release package must be returned to Chemistry before any additional release from the tank due to 0-RM-90-118 being Inoperable.

B. (1) The release will automatically terminate.

(2) The existing release package can be used for any additional release from the tank because 2-RM-90-400 remains Operable.

C. (1) A manual termination of the release will be required.

(2) The release package must be returned to Chemistry before any additional release from the tank due to 0-RM-90-118 being Inoperable.

D. (1) A manual termination of the release will be required.

(2) The existing release package can be used for any additional release from the tank because 2-RM-90-400 remains Operable.

94. In accordance with Tech Spec 3.7.7, "Control Room Emergency Ventilation System," (CREVS) Bases, which ONE of the following completes the statements below?

The Control Room Emergency Ventilation System (CREVS), when aligned for an emergency, _(1)_ all makeup air for the control room envelope (CRE.) The system is designed to maintain occupant dose for the ____(2)____ period after a design basis accident to less than or equal to 5 REM.

	(1)	(2)
A.	filters	7 day
B.	filters	30 day
C.	isolates	7 day
D.	isolates	30 day

95. Given the following:

- Unit-1 outage schedule logic changes for a planned 28-day refueling outage are being reviewed by an SRO to determine if they are safety significant in accordance with SPP-7.2 "Outage Management," Appendix E," Outage Schedule Logic Change Control."

In accordance with Appendix E, which ONE of the following proposed logic changes would meet the criteria for a Safety Significant change?

(REFERENCE PROVIDED)

A. Reschedule the Unit-1 loop #2 MSIV seat inspection from the core empty mid-loop period to the time period during core reload while SG secondary manways are removed for inspection.

B. Increase the cavity level from 711 feet to 712 feet elevation to minimize dose while unlatching control rods.

C. Add a 48 hour activity to perform preventative maintenance on the turbine driven auxiliary feedwater pump before entry into Mode 4.

D. Change the window for a contract diver to enter the CCW pump intake bay from the end of the outage (before starting CCW pumps) to the beginning of the outage (after securing CCW pumps.)

96. Given the following:

- Unit 1 is in Mode 5 with 1B RHR pump tagged for motor replacement.
- 1A RHR pump is in service and aligned for shutdown cooling.
- RCPs #1 and #2 are in service with RCPs #3 and #4 available if needed.
- All SG levels are between 16% and 20% narrow range with AFW flow in manual.

Which ONE of the following identifies the required action in accordance with Technical Specifications related to entry into Mode 4?

A. Mode 4 entry is allowed provided that alignment of the 1A RHR Pump in the ECCS cold leg injection Mode is made within 4 hours.

B. Mode 4 entry is allowed provided that the 1A RHR pump is capable of being manually aligned to the ECCS mode of operation if needed.

C. Prior to entering Mode 4, two Steam Generator levels must be raised to greater than 21% NR in loops with running RCPs.

D. Prior to entering Mode 4, Risk Assessment must be completed and risk management actions established in accordance with LCO 3.0.4.b.

97. In accordance with FHI-3, "Movement of Fuel," which ONE of the following identifies the maximum number of NEW and IRRADIATED fuel assemblies within the areas listed below that can be located out of approved storage locations?

	New Fuel Assemblies within the fuel-handling area	Irradiated Fuel Assemblies within the refueling canal
A.	1	2
B.	1	3
C.	2	2
D.	2	3

98. Given the following conditions:

- Both Units operating at 100% power.
- At 0600 RSO/KEOC issues a Stage I flood warning, due to extremely heavy rainfall.

In accordance with AOP-N.03, "Flooding," which ONE of the following identifies:

(1) the time the Stage I flood mode actions are required to be completed,

and

(2) if Stage II actions are required, the strategy used to prepare the Tritiated Drain Collector Tank to prevent a possible release of radioactivity?

	Time	Tritiated Drain Collector Tank
A.	1600	Pressurized to greater than 23 psig
B.	1600	Filled with water
C.	2300	Pressurized to greater than 23 psig
D.	2300	Filled with water

99. Given the following plant conditions on Unit 1:

Time	Condition
0803	PZR level dropping slowly.
0805	The crew enters AOP-R.05, "RCS Leak and Leak Source Identification."
0808	The crew trips the reactor and initiates Safety Injection.
0812	An ALERT is declared.
0828	A SITE AREA EMERGENCY is declared.

Which ONE of the following is the latest time that the first State notification must be made?

A. 0818

B. 0823

C. 0827

D. 0843

100. Given the following plant conditions:

- Unit 1 is at 100% power.
- Upon returning to the main control room, the SRO observes the following annunciator LIT on 1-M-6:

  "GROUP 4 MONITOR LIGHTS COMPONENT OFF NORMAL"

- The CRO has just completed adding water to Cold Leg Accumulator 3 and is waiting the completion of the required 20 minute run before stopping the Safety Injection Pump in accordance with 1-SO-63-1, "Cold Leg Injection Accumulators."

Which ONE of the following identifies...

(1) if the above alarm being LIT is consistent with the evolution in progress

and

(2) a Basis for the ECCS Subsystems LCO 3.5.1, "ACCUMULATORS?"

A. (1) The alarm is consistent.
   (2) To deliver sufficient volume of water to match boil off rates soon enough to minimize the consequences of the core being uncovered following a large break LOCA.

B. (1) The alarm is consistent.
   (2) To ensure sufficient volume of borated water will be immediately injected into the reactor core during the reflooding phase of a large break LOCA.

C. (1) The alarm is **NOT** consistent.
   (2) To deliver sufficient volume of water to match boil off rates soon enough to minimize the consequences of the core being uncovered following a large break LOCA.

D. (1) The alarm is **NOT** consistent.
   (2) To ensure sufficient volume of borated water will be immediately injected into the reactor core during the reflooding phase of a large break LOCA.

You have completed the test!

Sequoyah Sept 2010
NRC Examination
SRO Reference Package

1. Steam Tables
2. Mollier diagram
3. Tech Spec 3.9.12, Auxiliary Building Gas Treatment System, Ammend 301
4. Tech Spec 3.6.1.3, Containment Air Locks, Ammend. 301
5. EPIP-1, Emergency Plan Classification Matrix, page 9, 10
6. SPP-7.2, Outage Management, page 35-36, rev. 0020

ANSWER KEY REPORT

for SEPT 2010 SRO EXAM FINAL Test Form: 0

#	ID	Points	Type	Answers 0
1	008 AK2.02 1	1.00	MCS	B
2	011EK2.02 2	1.00	MCS	B
3	022 AA2.01 3	1.00	MCS	B
4	025 AG2.1.7 4	1.00	MCS	C
5	026 AK3.01 5	1.00	MCS	D
6	027 AA1.05 6	1.00	MCS	C
7	029 EG2.4.31 7	1.00	MCS	C
8	038 EA1.17 8	1.00	MCS	D
9	054 AA2.07 9	1.00	MCS	A
10	056 AA2.56 10	1.00	MCS	C
11	057 AK3.01 11	1.00	MCS	A
12	058 AK1.01 12	1.00	MCS	C
13	062 AA1.07 13	1.00	MCS	B
14	077 AA1.03 14	1.00	MCS	A
15	W/E04 EK1.1 15	1.00	MCS	D
16	W/E05 EK3.2 16	1.00	MCS	A
17	W/E11 EK2.1 17	1.00	MCS	C
18	W/E12 EG2.4.3 18	1.00	MCS	A
19	028 AK2.02 19	1.00	MCS	D
20	032 AK3.02 20	1.00	MCS	B
21	033 AG2.4.30 21	1.00	MCS	C
22	036 AK1.01 22	1.00	MCS	C
23	068 AA1.06 23	1.00	MCS	A
24	074 EA1.23 24	1.00	MCS	C
25	076 AK3.06 25	1.00	MCS	C
26	W/E14 EA2.1 26	1.00	MCS	B
27	W/E15 EK1.2 27	1.00	MCS	A
28	003 A4.03 28	1.00	MCS	C
29	004 K4.08 29	1.00	MCS	D
30	004 K5.29 30	1.00	MCS	A
31	005 G2.4.46 31	1.00	MCS	C
32	006 K2.04 32	1.00	MCS	A
33	007 K1.03 33	1.00	MCS	C
34	008 A2.08 34	1.00	MCS	D
35	008 K1.04 35	1.00	MCS	B
36	010 K4.02 36	1.00	MCS	C
37	012 A1.01 37	1.00	MCS	C
38	013 K5.02 38	1.00	MCS	D
39	013 K6.01 39	1.00	MCS	D
40	022 K3.01 40	1.00	MCS	D
41	025 K5.02 41	1.00	MCS	A
42	026 A3.01 42	1.00	MCS	C
43	026 A4.01 43	1.00	MCS	D
44	039 A3.02 44	1.00	MCS	C
45	059 K3.02 45	1.00	MCS	D
46	059 K3.03 46	1.00	MCS	C

ANSWER KEY REPORT
for SEPT 2010 SRO EXAM FINAL Test Form: 0

#	ID	Points	Type	Answers 0
47	061 K6.02 47	1.00	MCS	A
48	062 G2.4.35 48	1.00	MCS	C
49	063 A4.01 49	1.00	MCS	C
50	064 A2.05 50	1.00	MCS	C
51	073 A1.01 51	1.00	MCS	D
52	073 K1.01 52	1.00	MCS	C
53	076 K2.08 53	1.00	MCS	B
54	078 K4.02 54	1.00	MCS	D
55	103 A2.04 55	1.00	MCS	C
56	001 K2.03 56	1.00	MCS	A
57	002 A4.02 57	1.00	MCS	A
58	017 K3.01 58	1.00	MCS	D
59	027 K5.01 59	1.00	MCS	A
60	028 A1.02 60	1.00	MCS	D
61	034 K4.03 61	1.00	MCS	B
62	035 G2.2.40 62	1.00	MCS	A
63	055 K1.06 63	1.00	MCS	A
64	071 A3.02 64	1.00	MCS	B
65	075 A2.03 65	1.00	MCS	C
66	G 2.1.32 66	1.00	MCS	C
67	G 2.1.7 67	1.00	MCS	A
68	G 2.2.14 68	1.00	MCS	B
69	G 2.2.6 69	1.00	MCS	C
70	G 2.3.13 70	1.00	MCS	D
71	G 2.3.15 71	1.00	MCS	B
72	G 2.3.4 72	1.00	MCS	B
73	G 2.4.28 73	1.00	MCS	D
74	G 2.4.31 74	1.00	MCS	C
75	G 2.4.6 75	1.00	MCS	A
76	029 EA2.06 76	1.00	MCS	B
77	038 EG2.2.40 77	1.00	MCS	C
78	054 AG2.4.30 78	1.00	MCS	C
79	055 EA2.03 79	1.00	MCS	C
80	058 AG2.4.18 80	1.00	MCS	D
81	077 AA2.07 81	1.00	MCS	C
82	001 AA2.02 82	1.00	MCS	B
83	060 AG2.4.21 83	1.00	MCS	B
84	061 AA2.01 84	1.00	MCS	B
85	069 AG2.4.21 85	1.00	MCS	C
86	012 A2.01 86	1.00	MCS	B
87	039 A2.03 87	1.00	MCS	A
88	076 G 2.4.4 88	1.00	MCS	C
89	078 A2.01 89	1.00	MCS	A
90	103 G2.4.21 90	1.00	MCS	D
91	028 A2.01 91	1.00	MCS	D
92	068 A2.04 92	1.00	MCS	B

ANSWER KEY REPORT

for SEPT 2010 SRO EXAM FINAL Test Form: 0

#	ID	Points	Type	Answers 0
93	071 G2.2.36 93	1.00	MCS	A
94	G 2.1.27 94	1.00	MCS	B
95	G 2.2.18 95	1.00	MCS	A
96	G 2.2.40 96	1.00	MCS	B
97	G 2.3.12 97	1.00	MCS	B
98	G 2.3.14 98	1.00	MCS	B
99	G 2.4.30 99	1.00	MCS	C
100	G 2.4.46 100	1.00	MCS	B
SECTION 1 (100 items)		**100.00**		