

**Final Submittal**  
(Blue Paper)

Summer  
2007-301  
June 13, 2007  
AS GIVEN

Reactor Operator Written Examination

**V. C. SUMMER JUNE 2007 EXAM**

**EXAM NO. 05000395/2007301**

**JUNE 4 - 8, 2007 (OP TEST)**

**JUNE 13, 2007 (WRITTEN EXAM)**

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

**Applicant Information**

**Name:**

**Date:**

June 13, 2007

**Facility/Unit:**

V.C. Summer

**Region: II**

**Reactor Type: W**

**Start Time:**

**Finish Time:**

**Instructions**

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. 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**

Name: \_\_\_\_\_

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1. Given the following:

- The unit is at 85% power at MOL.
- A continuous uncontrolled control rod withdrawal occurs.

Which ONE (1) of the following parameters will DECREASE?

- A. Steam Generator Pressure
- B. Main Generator Electrical Output
- C. Overpower Delta T setpoint
- D. VCT Level

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2. Given the following plant conditions:

- A LOCA has occurred.
- RCS pressure is 1750 psig and lowering.
- Reactor Building pressure is 4 psig and rising.
- Steam Generator pressures are 1000 psig and stable.

Which ONE (1) of the following describes the actuations that are a result of this condition?

- A. Safety Injection ONLY.
- B. Safety Injection and Containment Ventilation Isolation ONLY.
- C. Safety Injection and Containment Isolation Phase A and Containment Ventilation Isolation ONLY.
- D. Safety Injection and Containment Isolation Phase A and Containment Ventilation Isolation and Containment Isolation Phase B.

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3. Given the following plant conditions:

- The crew is responding to an ATWS IAW EOP-13.0, *Response to Abnormal Nuclear Power Generation*, and is attempting an emergency boration of the RCS.
- MVT-8104, EMERG BORATE, valve will not open.

Which ONE (1) of the following describes the required actions to be performed and why?

- A. Open the Charging Pump Suction Header Isolation valves as directed by AOP-106.1, *Emergency Boration*, to maximize Boric Acid flowrate.
- B. Open LCV-115B/D, RWST to CHG PP Suct, as directed by AOP-106.1, *Emergency Boration*, to borate via cold leg injection.
- C. Open the Charging Pump Suction Header Isolation valves as directed by EOP-13.0, *Response to Abnormal Nuclear Power Generation*, to maximize Boric Acid flowrate.
- D. Open LCV-115B/D, RWST to CHG PP Suct, as directed by EOP-13.0, *Response to Abnormal Nuclear Power Generation*, to borate via cold leg injection.

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4. Which ONE (1) of the following describes the setpoints for the two (2) annunciators below?

RCP A/B/C THERM BAR & BRG FLO LO

CCBP DISCH HDR PRESS LO

- |    |        |         |
|----|--------|---------|
| A. | 90 gpm | 30 psig |
| B. | 90 gpm | 70 psig |
| C. | 50 gpm | 30 psig |
| D. | 50 gpm | 70 psig |

5. Given the following plant conditions:

- The plant is in Mode 5.
- The PZR is solid.
- RCS temperature is 190°F.
- RCS pressure is 315 psig.
- Letdown Pressure Control Valve PCV-145 is in AUTO.
- FCV-605A, "A" BYP, and FCV-605B, "B" BYP, are in MANUAL.

Which ONE (1) of the following describes a condition that will *initially* cause PCV-145 to CLOSE?

- A. Lowering the output of the controller for the in-service RHR heat exchanger flow control valve.
- B. Raising CCW flow through the in-service RHR Heat Exchanger.
- C. Lowering the setpoint of PCV-145.
- D. Starting an additional RHR Pump.

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6. Given the following plant conditions:

- The plant is in Mode 6.
- "B" Train RHR is in service.
- "A" Train RHR is out of service and expected to be returned to service in approximately 2 hours.
- Refueling is in progress.
- Cavity level is 23.5 feet above the reactor vessel flange.

"B" RHR Pump trips and cannot be restarted.

Which ONE (1) of the following describes the operational restriction(s) associated with this event?

- A. Refueling Cavity level must be raised to greater than 24 feet above the reactor vessel flange prior to continuing refueling activities.
- B. Refueling activities are permitted for up to 1 hour while repairs are initiated to "B" RHR Pump.
- C. All containment penetrations with a direct path to atmosphere must immediately be verified closed.
- D. Suspend all activities that could result in a reduction in boron concentration of the RCS.

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7. Given the following plant conditions:

- The plant was operating at 100% power.
- 7.2 KV Transformer XTF-4 was lost due to a fault.
- The associated D/G did NOT start as designed.
- Subsequently, a LOCA caused a reactor trip and safety injection.
- RCS pressure is currently 350 psig and trending down slowly.

Which ONE (1) of the following describes the operation of RHR Pumps for this condition?

- A. RHR pump A running with its miniflow valve open
- B. RHR pump A running with its miniflow valve closed
- C. RHR pump B running with its miniflow valve open
- D. RHR pump B running with its miniflow valve closed

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8. Which ONE (1) of the following directly supplies power to Charging Pump "A" and RHR Pump "A"?

	<u>Charging Pump "A"</u>	<u>RHR Pump "A"</u>
A.	1DA	1DA
B.	1DA1	1DA
C.	1DA	1DA1
D.	1DA1	1DA1

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9. Given the following plant conditions:

- The plant is operating in Mode 1 at 100% power.
- The following indications are reported by the RO.
  - TI-471, PRT Temperature is trending up and is now at 158°F.
  - PI-472, PRT Pressure is trending up and is now at 8 psig.

Which ONE (1) of the following components, if leaking, will cause this condition?

- A. XVR-8708A, RHR Pump "A" Suction Relief Valve.
- B. XVR-8121, RCP Seal Return Relief Valve.
- C. XVR-7169, RCDT Pumps Suction Relief Valve.
- D. XVS-8010, PZR Safety Valve.

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10. Which ONE (1) of the following describes an immediate action and the basis for the action in accordance with EOP-1.0, *Reactor Trip/Safety Injection Actuation*?
- A. Insert control rods in Manual; to insert negative reactivity by the most direct manner possible.
  - B. Insert control rods in Manual; to reduce or maintain RCS pressure to prevent lifting the Pressurizer safety valves.
  - C. Place EHC Pumps in PULL-TO-LK NON-A; to prevent uncontrolled cooldown of the RCS.
  - D. Place EHC Pumps in PULL-TO-LK NON-A; to minimize secondary makeup requirements.

11. Given the following plant conditions:

- A reactor trip and safety injection have occurred.
- RCS pressure is 1050 psig and lowering.
- Tavg is 550°F and lowering.
- Pressurizer level is 65% and rising rapidly.
- Reactor Building pressure is 2 psig and rising.

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

- A. Letdown line break.
- B. SBLOCA on an RCS cold leg.
- C. Stuck open pressurizer PORV.
- D. Stuck open pressurizer spray valve.

12. Given the following:

- The plant is at 100% power.
- All systems are in their normal alignments.
- A leak occurs in the Letdown Heat Exchanger.

Assuming no action by the crew, which ONE (1) of the following describes the effect(s) on the CCW System?

- A. RM-L2A/B indication rises. Surge Tank vent valve PVV-7096 closes when the indication reaches the ALERT level.
- B. RM-L2A/B indication rises. Surge Tank vent valve PVV-7096 closes when the indication reaches the HI RAD level.
- C. Surge Tank level lowers. CCW Booster Pumps will trip on low suction pressure.
- D. Surge Tank level lowers. CCW Pumps will lose suction when the Surge Tank empties.

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13. Given the following plant conditions:

- A LOCA occurred and RCS pressure reached 1380 psig.
- All actions of EOP-1.0 were performed as required.
- The crew is performing EOP-2.1, *Post-LOCA Cooldown and Depressurization*.
- RCS pressure is currently 1335 psig.
- RCS temperature is currently 496°F.
- Two Charging pumps are running.
- The crew is evaluating stopping 1 Charging Pump.

Given the above conditions, which ONE (1) of the following describes whether the Charging Pump may be stopped, and why?

- A. No, because subcooling is not greater than 30°F.
- B. Yes, because subcooling is greater than 30°F.
- C. Yes, because subcooling is greater than 87.5°F.
- D. No, because subcooling is not greater than 87.5°F.

14. Given the following plant conditions:

- The Plant is in Mode 3.
- A PZR PORV begins leaking to the PRT.
- Pressurizer pressure is 985 psig.
- PRT pressure is steady at 5 psig.
- PRT temperature is steady at 90°F.

Assume:

- Ambient heat losses are negligible.
- Steam quality in the pressurizer is 100%.

Which ONE (1) of the following would be the approximate MCB indication on TI-463, RELIEF TEMP °F?

- A. 225°F
- B. 275°F
- C. 300°F
- D. 325°F

15. Given the following plant conditions:

- The Reactor has tripped from 100% power.
- "A" and "C" Service Water (SW) pumps were running.
- The crew implemented EOP-1.0, *Reactor Trip/Safety Injection Actuation*, then transitioned to EOP-1.1, *Reactor Trip Recovery*.
- MDEFW pumps started on Lo-Lo SG levels after the trip.
- Subsequently, an SI actuated due to a Large Break LOCA.

Which ONE (1) of the following describes the operation of equipment as a result of the SI?

- A. MDEFW pumps will trip and be restarted by the sequencer. Service Water Pumps "A" and "C" will continue to run.
- B. MDEFW pumps will continue to run. Service Water Pumps "A" and "C" will trip and be restarted by the sequencer.
- C. MDEFW pumps will trip and be restarted by the sequencer. Service Water Pumps "A" and "C" will trip and be restarted by the sequencer.
- D. MDEFW pumps will continue to run. Service Water Pumps "A" and "C" will continue to run.

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16. Given the following plant conditions:

- A load rejection has occurred from 100% power.
- All control systems responded as designed.
- Power level is now stable at 70%.

Which ONE (1) of the following conditions will exist during this event?

- A. Charging Flow Control Valve, FCV-122, will be throttling open.
- B. Pressurizer Backup Heaters will be energized.
- C. Pressurizer PORVs will be open.
- D. Letdown Backpressure Control Valve PCV-145 will be throttling closed.

17. Given the following plant conditions:

- A reactor trip has occurred from 100% power.
- Reactor Trip Breaker "B" remains CLOSED.

Which ONE (1) of the following describes the effect on the Steam Dump System?

- A. The steam dump valves will open and maintain Tavg at 557°F.
- B. The steam dumps will remain closed following the reactor trip due to loss of the arming signal.
- C. The steam dumps will remain closed following the reactor trip due to loss of the 'plant trip' modulation signal.
- D. The steam dump valves will open and maintain Tavg at 559°F.

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18. Which ONE (1) of the following describes the source of control power to Reactor Trip Breaker "B" and Reactor Trip Bypass Breaker "B"?

	<u>Reactor Trip Breaker B</u>	<u>Reactor Trip Bypass Breaker B</u>
A.	125 VDC Bus 1HB	125 VDC Bus 1HB
B.	125 VDC Bus 1HB	125 VDC Bus 1HA
C.	120 VAC APN-5902	120 VAC APN-5902
D.	120 VAC APN-5902	120 VAC APN-5901

19. Given the following plant conditions:

- A reactor trip has occurred coincident with a loss of off-site power.
- While performing action in the EOPs, the following events occur:
  - RCS pressure is 1700 psig and lowering.
  - RB pressure is 4.7 psig and rising slowly.
- Three minutes after these indications are observed, APN-5904 fails and becomes de-energized.

Which ONE (1) of the following describes the effect, if any, on plant equipment after the APN failure?

- A. Train A and Train B ECCS equipment is operating as required; Train A and Train B RB Spray Pump discharge valves are open.
- B. Train A and Train B ECCS equipment is operating as required; Train A and Train B RB Spray Pump discharge valves are closed.
- C. Train A ECCS equipment is operating as required; Train B ECCS equipment is NOT running; Train A and Train B RB Spray Pump discharge valves are open.
- D. Train A ECCS equipment is operating as required; Train B ECCS equipment is NOT running; Train A and Train B RB Spray Pump discharge valves are closed.

20. Given the following plant conditions:

- A LOCA has occurred.
- RCS pressure is 200 psig.
- "A" Reactor Building Spray Pump is Out of Service.
- Containment pressure has exceeded the High-3 setpoint.
- Train "B" Phase A has failed to actuate.
- All other actuations and Train "A" ECCS equipment is running as required.
- The most recent Chemistry sample of the RCS indicated that RCS activity is  $5 \times 10^{-2}$  microcuries/ml Dose Equivalent Iodine.

Assuming no action by the crew, which ONE (1) of the following describes the effect on the plant?

- A. Containment will exceed its design pressure.
- B. Off-Site releases will exceed accident analysis assumptions.
- C. Only 1 Containment Isolation Valve in each Phase A penetration will be closed.
- D. Only half of the Containment penetrations required for isolation will receive isolation signals.

21. Given the following plant conditions:

- A reactor startup is in progress.
- SR Channel N-31 indicates  $7 \times 10^3$  CPS.
- SR Channel N-32 indicates  $7 \times 10^3$  CPS.
- IR Channel N-35 indicates  $8.7 \times 10^{-6}\%$  power.
- IR Channel N-36 indicates  $6.0 \times 10^{-6}\%$  power.

Which ONE (1) of the following describes (1) the existing plant condition, (2) the status of P-6, and (3) the action required in accordance with AOP-401.8, Intermediate Range Channel Failure?

- A. (1) N-36 is undercompensated;  
(2) P-6 should NOT be satisfied;  
(3) maintain power stable until N-36 is repaired.
- B. (1) N-36 is overcompensated;  
(2) P-6 should be satisfied;  
(3) maintain power stable until N-36 is repaired.
- C. (1) N-36 is undercompensated;  
(2) P-6 should be satisfied;  
(3) place the unit in Mode 3 until N-36 is repaired.
- D. (1) N-36 is overcompensated;  
(2) P-6 should NOT be satisfied;  
(3) place the unit in Mode 3 until N-36 is repaired.

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22. Given the following plant conditions:

- The plant is operating at 8% power.
- A Loss of Component Cooling Water has occurred.
- "A" RCP motor bearing temperature is 189°F and rising slowly.
- "A" RCP lower seal water bearing temperature is 226°F and rising slowly.
- The crew has entered AOP-118.1, *Loss of Component Cooling Water*.

Which ONE (1) of the following actions is required?

- A. RCP motor bearing temperature exceeds operating limits. Stop 'A' RCP and initiate a plant shutdown IAW GOP-4B, *Power Operation (Mode 1-Descending)*.
- B. RCP lower seal water bearing temperature exceeds operating limits. Stop 'A' RCP and initiate a plant shutdown IAW GOP-4B, *Power Operation (Mode 1-Descending)*.
- C. RCP motor bearing temperature exceeds operating limits. Trip the reactor, stop 'A' RCP, and go to EOP-1.0, *Reactor Trip/Safety Injection Actuation*.
- D. RCP lower seal water bearing temperature exceeds operating limits. Trip the reactor, stop 'A' RCP, and go to EOP-1.0, *Reactor Trip/Safety Injection Actuation*.

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23. Given the following plant conditions:

- The plant is in Mode 3.
- The following wide-range pressures are indicated:
  - PT-402 - 1335 psig
  - PT-403 - 1350 psig
  - PT-455A - 1285 psig
- Subcooling indication on TI-499A and TI-499B indicates the following:

<u>TI-499A</u>	<u>TI-499B</u>
27°F	22°F

Which ONE (1) of the following describes the core exit temperature used to determine RCS subcooling for the indications above?

- A. Train A - 550°F; Train B - 560°F.
- B. Train A - 557°F; Train B - 550°F.
- C. Train A - 557°F; Train B - 560°F.
- D. Train A - 560°F; Train B - 557°F.

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24. Given the following plant conditions:

- A Reactor Trip condition existed and the Reactor failed to trip.
- RCS pressure now indicates 2350 psig.

Assuming no other events are in progress, which ONE (1) of the following describes the 1) appropriate action and the 2) reason for that action?

- A. 1) Verify PZR PORVs and Block Valves open  
2) To increase flow on FI-943, CHG LOOP B CLD/HOT LEG FLOW GPM
- B. 1) Verify PZR PORVs and Block Valves open  
2) To increase flow on FI-110, EMERG BORATE FLOW GPM
- C. 1) Place both ESFLS A(B) Resets to NON-ESF LCKOUTS  
2) To increase flow on FI-943, CHG LOOP B CLD/HOT LEG FLOW GPM
- D. 1) Place both ESFLS A(B) Resets to NON-ESF LCKOUTS  
2) To increase flow on FI-110, EMERG BORATE FLOW GPM

25. Given the following plant conditions:

- The plant was at 100% power.
- A reactor trip and safety injection occurred.
- RBCUs XFN-0064A and XFN-0064B started in SLOW.
- While performing the actions of EOP-1.0, *Reactor Trip/Safety Injection Actuation*, the following alarms are received in the control room:
  - XCP-605-3-1, SW FR RBCU 1B/2B FLO LO
  - XCP-605-3-2, SW FR RBCU 1B/2B PRESS LO

Which ONE (1) of the following choices contains both of the conditions that could each independently cause these annunciators to alarm?

- A. SWBP "B" tripped;  
MVG-3111B, RBCU 64B/65B TO IND COOLING going CLOSED.
- B. SWBP "B" tripped;  
MVG-3109C, RBCU 64B OUTLET ISOL going CLOSED.
- C. XFN-0064B (1B RBCU SS FAN) tripped;  
MVG-3108C, RBCU 64B INLET ISOL going CLOSED.
- D. XFN-0064B (1B RBCU SS FAN) tripped;  
MVG-3109D, RBCU 65B OUTLET ISOL going CLOSED.

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26. Which ONE (1) of the following describes the power supplies that directly feed Containment Spray Header Isolation Valves XVG-3003A and XVG-3003B, respectively?
- A. XSW1DA1 and XSW1DB1
  - B. XMC1DA2X and XMC1DB2Y
  - C. XMC1DB2X and XMC1DA2Z
  - D. XMC1DA2Z and XMC1DB2X

27. Given the following plant conditions:

- A LOCA has occurred.
- RCS pressure is 450 psig.
- Reactor Building pressure is 18 psig and lowering.
- RWST level is lowering.
- Reactor Building Sump level is rising.
- "A" Reactor Trip Breaker remained closed.

Which ONE (1) of the following describes the operation of the Reactor Building Spray system as the event continues?

RB Spray Pump suction to the RB Sump Valves, MVG-3005A and B . . .

- A. are manually opened when RWST level reaches its setpoint. RB Spray Pump suction valves from RWST, MVG-3001A and B, are manually closed when MVG-3005A and B are fully open.
- B. automatically open when RWST level reaches its setpoint. RB Spray Pump suction valves from RWST, MVG-3001A and B, automatically close when MVG-3005A and B are fully open.
- C. are manually opened when Reactor Building Sump level reaches its setpoint. RB Spray Pump suction valves from RWST, MVG-3001A and B, are manually closed when MVG-3005A and B are fully open.
- D. automatically open when Reactor Building Sump level reaches its setpoint. RB Spray Pump suction valves from RWST, MVG-3001A and B, automatically close when MVG-3005A and B are fully open.

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28. With the unit at 100% power, which ONE (1) of the following describes the potential consequence of PCV-444C, PZR Spray Valve, failing open?
- A. Loss of PZR pressure can result in an unwarranted OP Delta T runback and reactor trip.
  - B. PZR pressure will remain stable as PZR heaters will compensate for the pressure reduction.
  - C. Loss of PZR pressure may result in steam formation in the reactor vessel head and SG tubes.
  - D. Loss of PZR pressure can result in an unwarranted OT Delta T runback and reactor trip.

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29. Which ONE (1) of the following describes the purpose and function of the Reactor Building Charcoal Cleanup Units?

Designed for...

- A. primary means of long term post accident iodine removal from the RB atmosphere. Discharge is aligned to the RB Purge system exhaust.
- B. primary means of long term post accident iodine removal from the RB atmosphere. Discharge is aligned to the RB atmosphere.
- C. RB pre-entry reduction of airborne contaminants. Discharge is aligned to the RB Purge system exhaust.
- D. RB pre-entry reduction of airborne contaminants. Discharge is aligned to the RB atmosphere.

## 2007 Post Retake NRC Exam Question Review

Question Missed	Question Deficient (Yes/No)	Training Materials/Program Consideration (Yes/No)	Reference	Resolution
<b>RO/SRO</b>				
3	Yes *	Yes *	EOP-13.0, Simulator scenarios	Training material feedback submitted to revise choices A & C to clarify "maximize Boric Acid flowrate". Also submitted feedback to include this in an RO/SRO scenario. Reviewed this question with each candidate.
4	No	No	IB-2, Simulator	Reviewed this question with each candidate.
10	No	No	EOP-1.0	Reviewed this question with each candidate.
14	No	No	EOP-2.1, Simulator scenarios	Reviewed this question with each candidate.
15	No	No	IB-1, IB-3, GS-2, Simulator scenarios	Reviewed this question with each candidate.
16	No	No	IC-3, Simulator	Reviewed this question with each candidate.
18	No	Yes *	IC-9	Feedback submitted to include discussion of RTB control power in IC-9.
21	No	No	IC-8	Some examinees were confused with terminology "satisfied/NOT satisfied" in choices. Feedback submitted to clarify. Reviewed this question with each candidate.
24	Yes *	No	AOP-106.1	Reducing RCS pressure would not result in a <i>direct</i> increase in flow on FI-110. Feedback submitted to clarify. Reviewed this question with each candidate.
27	No	No	AB-8	Although technically correct, entire answer was not available. Feedback submitted to provide entire correct answer.
28	Yes *	No	IC-6	Some confusion over "unwarranted". Feedback provided during exam to view "unwarranted" as "undesired." Training feedback submitted to revise choices A&D similarly.
29	No	No	AB-17	Reviewed this question with each candidate.
30	No	No	EOP-4.0	Reviewed this question with each candidate.

30. Given the following plant conditions:

- The unit was initially operating at full power.
- A loss of ALL offsite power occurred in conjunction with a steam generator tube rupture.
- All safeguards equipment functioned as required.
- The following plant conditions now exist:
  - Ruptured S/G pressure = 1100 psig, stable
  - Core exit TC = 505°F, slowly decreasing
  - RCS Pressure = 1600 psig, stable
  - PZR Level = 4%, stable
  - Total SI Flow = 600 gpm
- The RCS has been cooled down to target temperature.
- In accordance with EOP-4.0, *Steam Generator Tube Rupture*, the RO opens one PZR PORV.
- Soon after opening the valve, the operator observes that all channels of PZR level are rapidly increasing.
- ECCS flow has increased from 600 gpm to 650 gpm.

Which ONE (1) of the following is the cause of this indication?

- A. PZR level instruments are not calibrated for temperatures less than 600°F.
- B. Safety injection flow is driving the RCS to a water - solid condition.
- C. Voiding in the reactor vessel head is forcing water up the surge line.
- D. Backflow has been established from the ruptured S/G to the RCS.

31. Given the following plant conditions:

- A Large Break LOCA has occurred.
- Reactor Building H<sub>2</sub> concentration was at 2% and rising.
- 'A' Hydrogen Recombiner is INOPERABLE.

Which ONE (1) of the following describes the effect on the removal of Hydrogen from Containment?

- A. Hydrogen concentration will remain below 4% with only one Recombiner in operation.
- B. Hydrogen concentration will rise above 4% but remain below 6% with only one Recombiner in operation.
- C. Hydrogen concentration will remain below 4% only if the Containment Purge System is placed in service in addition to the Recombiner.
- D. Hydrogen concentration will remain below 4% only if Containment Spray is placed in service in addition to the Recombiner.

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32. Which ONE (1) of the following describes a feature of the Spent Fuel Pool and/or Cooling system that will maintain radiation dose levels at acceptable limits during plant operations?
- A. Spent Fuel Cooling Pumps will trip on low suction pressure prior to Spent Fuel Pool level dropping below 460'6".
  - B. Boron concentration is maintained so that Spent Fuel Pool Keff is less than 0.95 and Spent Fuel Pool Radiation levels are maintained less than 2.5 mr/hr at the surface of the pool.
  - C. Anti-siphoning holes in the cooling system suction and return lines ensures that Spent Fuel Pool level will not drop below 460'6".
  - D. Interlocks on the Spent Fuel Pool Manipulator Crane prevent spent fuel assemblies from travelling closer than 23 feet from the surface of the Spent Fuel Pool.

33. Which ONE (1) of the following describes the *initial* **SG Level Response** and **SGWLC System Response** during a rapid increase in power?

**SG Level Response**

**SGWLC System Response**

- |              |  |
|--------------|--|
| A. Decreases | Lag circuit on SG level input minimizes fluctuations |
| B. Decreases | Programmed D/P across the FRV minimizes fluctuations |
| C. Increases | Programmed D/P across the FRV minimizes fluctuations |
| D. Increases | Lag circuit on SG level input minimizes fluctuations |

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34. Given the following plant conditions:

- The plant is in Mode 6, core reload is in progress.
- A fuel assembly is being inserted into the core when downward motion stops.
- The Refueling SRO notes the following:
  - The SLACK CABLE light is ON
  - The LOWER SLOW ZONE light is OFF
  - The GRIPPER TUBE DOWN light is OFF

Which ONE (1) of the following describes the reason that downward movement stopped and the subsequent operation related to the interlock?

- A. Total load fell more than 150-300# below nominal full load; bypassing the interlock is not possible.
- B. The fuel assembly approached 10" from the bottom of the core; bypassing the interlock is not possible.
- C. Total load fell more than 150-300# below nominal full load; bypass the interlock to allow the assembly to be fully inserted.
- D. The fuel assembly approached 10" from the bottom of the core; bypass the interlock to allow the assembly to be fully inserted.

35. Given the following plant conditions:

- Reactor power is 75%.
- RCS leak rate data is as follows:
  - Total RCS leakage rate is 9.1 gpm.
  - Leakage to PRT is 7.0 gpm.
  - Leakage to the Reactor Coolant Drain Tank is 1.3 gpm.
  - Total primary to secondary leakage is 0.33 gpm.
    - SG 1 – 0.09 gpm
    - SG 2 – 0.17 gpm
    - SG 3 – 0.07 gpm

Which ONE (1) of the following describes RCS leakage in relation to Technical Specification limits?

- A. Identified leakage exceeds the TS limit
- B. Unidentified leakage exceeds the TS limit
- C. Primary to Secondary leakage exceeds the TS limit
- D. All RCS leakage is within TS limits

36. Given the following plant conditions:

- The unit is in Mode 3.
- A steam line break has occurred on "A" Steam Line in the Reactor Building.

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

- A. "A" Main Steam Line pressure will drop. "B" and "C" Main Steam Line pressures will remain constant. All MSIVs will close when at least 2 Containment pressure transmitters indicate 3.6 psig.
- B. "A" Main Steam Line pressure will drop. "B" and "C" Main Steam Line pressures will remain constant. All MSIVs will close when "A" Main Steam Line pressure indicates less than 675 psig.
- C. All 3 Main Steam Line pressures will drop. All MSIVs will close when at least 2 Containment pressure transmitters indicate 3.6 psig.
- D. All 3 Main Steam Line pressures will drop. All MSIVs will close when at least 2 Main Steam Lines indicate less than 675 psig.

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37. Which ONE (1) of the following describes the purpose of C-9, Condenser Availability, and C-16, Condenser Pressure, permissive signals?

A. C-9 prevents 2 steam dump valves from operating during conditions that could damage the condensers.

C-16 arms ALL condenser dump valves when condenser is below 4.5" Hg abs and adequate circ water pumps are available.

B. C-9 arms ALL condenser dump valves when condenser is below 7.5" Hg abs and adequate circ water pumps are available.

C-16 prevents 2 steam dump valves from operating during conditions that could damage the condensers.

C. C-9 anticipates condenser heat load problems by blocking 2 condenser dump valves at 7.5 "Hg abs.

C-16 prevents ALL condenser steam dump valves from operating during conditions that could damage the condensers.

D. C-9 prevents ALL condenser steam dump valves from operating during conditions that could damage the condensers.

C-16 anticipates condenser heat load problems by blocking 2 condenser dump valves at 4.5 "Hg abs.

38. Given the following plant conditions:

- The plant is operating at 100% power.
- A Feedwater Line Break occurs at the piping connection to "A" SG.

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

- A. RCS temperature rises prior to reactor trip. SG "A" continues to depressurize after FWIV closure.
- B. RCS temperature lowers prior to reactor trip. SG "A" continues to depressurize after FWIV closure.
- C. RCS temperatures lowers prior to reactor trip. SG "A" pressure stabilizes after FWIV closure.
- D. RCS temperature rises prior to reactor trip. SG "A" pressure stabilizes after FWIV closure.

39. Given the following plant conditions:

- A Station Blackout has occurred.
- The crew is restoring off-site power to Bus 1DA through the normal feed.

Prior to closing the normal feeder breaker to Bus 1DA, which ONE (1) of the following sets of actions must be performed, in accordance with AOP-304.1, *Loss of Bus 1DA with Diesel Unavailable?*

- A. De-energize Train "A" ESFLS  
Ensure Bus 1DA TRANSFER INIT Switch is in OFF
- B. De-energize Train "A" ESFLS  
Ensure Bus 1DA TRANSFER INIT Switch is in ON
- C. Reset NON-ESF LCKOUTS & AUTO-START BLOCKS  
Ensure Bus 1DA TRANSFER INIT Switch is in OFF
- D. Reset NON-ESF LCKOUTS & AUTO-START BLOCKS  
Ensure Bus 1DA TRANSFER INIT Switch is in ON

40. Given the following plant conditions:

- A loss of off-site power has occurred.
- Both EDGs have responded as designed.
- Subsequently, safety injection occurs.
- The following conditions exist on "A" EDG:
  - Frequency 59.9 Hz.
  - Voltage 7150 Volts
  - KW Output 2600 KW

RB Pressure reaches an actuation setpoint requiring the start of "A" RB Spray pump

Loads stabilize . . . . .

Which ONE (1) of the following describes the status of "A" EDG?

- A. All listed parameters are within limits.
- B. Frequency is below the limit.
- C. Voltage is below the limit.
- D. Output exceeds the continuous KW rating.

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41. Given the following plant conditions:

- IAW GOP-4A, *Power Operation (Mode 1-Ascending)*, power has been stabilized between 12 and 15%.
- Preparations are being made to roll the Main Turbine to 1800 rpm.
- Reactor power indicates the following:
  - IR N-35 -  $1 \times 10^1\%$ .
  - IR N-36 -  $1 \times 10^1\%$ .
  - PR N-41 - 15%.
  - PR N-42 - 14%.
  - PR N-43 - 14%.
  - PR N-44 - 14%.
- Inverter XIT-5902 output breaker trips open.

Which ONE (1) of the following describes the effect on the unit?

- A. A Power Range Rod Stop (C-2) signal, with no change in reactor power.
- B. A reactor trip due to the deenergization of Intermediate Range Channel N-35.
- C. A reactor trip due to the deenergization of Intermediate Range Channel N-36.
- D. An Intermediate Range Rod Stop (C-1) signal, with no change in reactor power.

42. Given the following plant conditions:

- The plant is operating at 100% power.
- The following annunciators are received in the control room:
  - XCP-636, 4-6, DC SYS OVRVOLT/UNDRVOLT
  - XCP-637, 1-5, INV 3/4 TROUBLE
- Inverter output voltage indicates 120 vac.

Assuming NO other alarms are received, which ONE (1) of the following describes the common cause of both of the alarms?

- A. Loss of Alternate Source 1FB.
- B. Loss of Normal Source 1DB2Y.
- C. Loss of voltage on Bus 1HB.
- D. Inverter has transferred to Alternate Source 1FB.

43. Given the following plant conditions:

- The plant is operating at 100% power.
- The following alarm is received:
  - XCP-624-1-5, SG A LVL DEV
- The RO determines that SG "A" level is rising slowly on LI-474, 475, and 476.
- SG "B" and "C" levels are stable.

Which ONE (1) of the following describes the cause of the alarm and the action required ?

Alarm was received on a . . .

- A. 5% deviation from program due to a Feedwater Control Valve failure; Place "A" Feedwater Control valve in manual and restore level to normal.
- B. 5% deviation from program due to a Steam Flow input to "A" SG level control failing low; Select the alternate feed flow and steam flow inputs.
- C. 10% deviation from program due to a Feedwater Control Valve failure; Place "A" Feedwater Control valve in manual and restore level to normal.
- D. 10% deviation from program due to a Steam Flow input to "A" SG level control failing low; Select the alternate feed flow and steam flow inputs.

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44. Which ONE (1) of the following conditions will result in the most Emergency Feedwater System flow required to maintain SG levels constant following a reactor trip?

	<u>Core Burnup</u>	<u>Initial Power Level</u>
A.	1,000 MWD/MTU	10%
B.	1,000 MWD/MTU	100%
C.	10,000 MWD MTU	10%
D.	10,000 MWD/MTU	100%

45. Given the following plant conditions:

- The plant is at 100% power during an A1 maintenance week.
- APN-5901 has been transferred to APN-1FA while work is in progress on XIT-5901.
- The normal feeder breaker for bus 1DA trips open.
- "A" D/G fails to start.

Which ONE (1) of the following describes the subsequent operation of the "A" Train ESFLS?

- A. Output 1 will shed loads and the ESFLS will go through its normal sequence.
- B. Output 1 will shed loads, but then the ESFLS will be prevented from operating.
- C. Output 1 will NOT shed loads, but the ESFLS will go through its normal sequence.
- D. Output 1 will NOT shed loads and the ESFLS will be prevented from operating.

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46. Which ONE (1) of the following describes the availability of Channel I (Train A) 120 VAC vital safeguards power during a loss of the 115KV line from the Parr Generating Complex?
- A. Is initially available from Battery 1A through inverter XIT-5901, then automatically returns to the normal source after Diesel Generator "A" starts.
  - B. The static switch initially transfers the supply to 1FA, then automatically returns to the normal source after Diesel Generator "A" starts.
  - C. Is initially available from Battery 1A through inverter XIT-5901, then is manually returned to the normal source after Diesel Generator "A" starts.
  - D. The static switch initially transfers the supply to 1FA, then is manually returned to the normal source after Diesel Generator "A" starts.

47. The plant is at 100% power.

A loss of 125 VDC control power to the \_\_\_\_\_ will require entry to EOP-1.0, *Reactor Trip/Safety Injection Actuation*.

- A. FWBP breakers
- B. MSIVs
- C. RCP breakers
- D. PZR Spray Valves

48. Given the following plant conditions:

- A loss of off-site power has occurred.
- Both EDGs start as required.

Which ONE (1) of the following describes the operation of the EDG Room Ventilation system?

Automatically start when...

- A. Diesel Room temperature exceeds 88°F, to maintain room temperature below the Technical Specification limit of 120°F.
- B. the associated Diesel Generator starts, to maintain room temperature below the Technical Specification limit of 88°F.
- C. Diesel Room temperature exceeds 72°F, to maintain room temperature below the Technical Specification limit of 88°F.
- D. the associated Diesel Generator starts, to maintain room temperature below the Technical Specification limit of 120°F.

49. Given the following plant conditions:

- Emergency Diesel Generator "A" is paralleled to its associated Bus.
- A lagging power factor has been established.

Which ONE (1) of the following describes the operation of the diesel generator voltage control switch?

- A. Lowering the voltage control setpoint will cause the generator to pick up a larger share of the real load.
- B. Raising the voltage control setpoint will cause the generator to pick up a larger share of the real load.
- C. Lowering the voltage control setpoint will cause the generator to pick up a larger share of the reactive load.
- D. Raising the voltage control setpoint will cause the generator to pick up a larger share of the reactive load.

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50. Given the following plant conditions:

- A loss of RB Instrument Air has occurred.
- RB Instrument Air header pressure is currently 94 psig and lowering.

Assuming no operator action, which ONE (1) of the following describes the response of the Air System and why?

RB Instrument Air header pressure decreases until...

- A. PVA-2659, INST AIR TO RB AIR SERV, automatically opens at 90 psig to ensure an air supply for AOVs inside the Reactor Building.
- B. PVA-2659, INST AIR TO RB AIR SERV, automatically opens at 93 psig to ensure an air supply for AOVs inside the Reactor Building.
- C. PVT-2660, AIR SPLY TO RB, closes at 90 psig to isolate the RB header to avoid a loss of Instrument Air outside the Reactor Building.
- D. PVT-2660, AIR SPLY TO RB, closes at 93 psig to isolate the RB header to avoid a loss of Instrument Air outside the Reactor Building.

51. Given the following plant conditions:

- The plant is in Mode 6.
- Reactor Building Purge is in operation.
- Refueling activities are in progress.
- A spent fuel assembly is dropped in the cavity.
- Containment radiation monitor indications are all rising.

Which ONE (1) of the following describes the radiation monitors that will initiate isolation of all or part of the Containment Purge?

RM-A4, RB Purge Exhaust Particulate (Iodine) (Gas) Atmos monitor...

- A. ONLY.
- B. AND RM-G17A/B, RB Manipulator Crane Area Gamma ONLY.
- C. AND RM-A2, RB Sample Line Particulate (Iodine) (Gas) Atmos monitor ONLY.
- D. AND RM-G17A/B, RB Manipulator Crane Area Gamma, AND RM-A2, RB Sample Line Particulate (Iodine) (Gas) Atmos monitor.

52. Given the following plant conditions:

- An immediate discharge to the penstocks from both Waste Monitor tanks is required.
- Current conditions are as follows.
  - RM-L5 and RM-L9 are out of service
  - Fairfield Hydro is in the "pumping" mode.

Which ONE (1) of the following statements will provide the MINIMUM conditions necessary for monitor tank release?

- A. Either RM-L5 or RM-L9 must be restored to operability prior to release.
- B. Both RM-L5 and RM-L9 must be restored to operability prior to release.
- C. The Fairfield Hydro must convert to the generating mode and redundant samples performed prior to release. Two independent qualified individuals must verify release calculations and valve lineups.
- D. The Fairfield Hydro must convert to the generating mode prior to release and either RM-L5 or RM-L9 must be restored to operability. Two independent qualified individuals must verify release calculations and valve lineups.

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53. Which ONE (1) of the following describes operation of XFN-30A(B), CONTR RM EMERG FILTERING SYS FAN A(B), and XFN-32A(B), CONTROL ROOM COOLING UNIT A(B) FAN upon receipt of a high radiation alarm on RM-A1, Control Bldg Supply Air?
- A. Both XFN-32A & B and both XFN-30A & B start, all outside air sources are isolated.
  - B. Both XFN-32A & B and both XFN-30A & B start, return air is mixed with a small amount of makeup air.
  - C. Both XFN-32A & B trip and both XFN-30A & B start, all outside air sources are isolated.
  - D. Both XFN-32A & B trip and both XFN-30A & B start, return air is mixed with a small amount of makeup air.

54. Given the following plant conditions:

- The plant is in Mode 5.
  - RHR Train A is in service.
  - RCS temperature is 168°F.
  - RCS pressure is 175 psig.
- 
- Subsequently, a Loss of Service Water occurs.
  - The crew is performing actions contained in AOP-117.1, *Total Loss of Service Water*.
  - NEITHER Service Water loop can be restored.

Which ONE (1) of the following describes the effect on the RHR System, and the procedure that will mitigate the event?

- A. Stabilize RHR/RCS system temperature using steam dumps IAW GOP-6, *Plant Shutdown Mode 3 to Mode 5*. Go to AOP-115.3, *Loss of RHR with the RCS Intact*, for long-term mitigation.
- B. Stabilize RHR/RCS system temperature using steam dumps IAW GOP-6, *Plant Shutdown Mode 3 to Mode 5*. Continue using AOP-117.1, *Total Loss of Service Water*, for long-term mitigation.
- C. RHR/RCS system temperature will rise as a result of a loss of cooling to Component Cooling Water. Go to AOP-115.3, *Loss of RHR with the RCS Intact*.
- D. RHR/RCS system temperature will rise as a result of a loss of cooling to Component Cooling Water. Continue using AOP-117.1, *Total Loss of Service Water*.

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55. Which ONE (1) of the following provides the electrical power supply to the Supplemental Air Compressor?

A. XSW1DA1

B. XSW1DB1

C. XSW1A1

D. XSW1B1

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56. Given the following plant conditions:

- The Fire Protection System actuated due to a Main Transformer Fire.
- System pressure dropped to 80 psig before recovering due to the actuation of necessary equipment.
- The fire is out.
- The deluge valve is isolated and reset.

Which ONE (1) of the following describes the equipment that is running, and the method of shutting the equipment down?

- A. ONLY the Motor Driven Fire Pump is running; must be stopped locally.
- B. ONLY the Motor Driven Fire Pump is running; may be stopped locally or in the control room.
- C. The Motor Driven and Engine Driven Fire Pumps are running. Both must be stopped locally.
- D. The Motor Driven and Engine Driven Fire Pumps are running. The Motor Driven Pump may be stopped locally or in the control room, the Engine Driven Pump must be stopped locally.

57. Given the following plant conditions:

- A LOCA has occurred.
- Safety Injection is actuated.
- Reactor Building pressure indicates 14 psig and rising slowly.
- While performing actions of EOP-1.0, *Reactor Trip/Safety Injection Actuation*, the following valves indicate OPEN:
  - RCP SL WTR ISOL 8100
  - LTDN ISOL 8152
  - RB AIR SERV ISOL 2660

Which ONE (1) of the following describes the failure that has occurred and the MINIMUM action necessary to mitigate the condition?

- A. Phase A has partially failed. Place either Phase A actuation switches in the ACTUATE position.
- B. Phase A has partially failed. Place both Phase A actuation switches in the ACTUATE position.
- C. Phase B has partially failed. Place either Phase B actuation switches in the ACTUATE position.
- D. Phase B has partially failed. Place both Phase B actuation switches in the ACTUATE position.

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58. Given the following plant conditions:

- The reactor has tripped. Safety Injection is actuated.
- An RCS cooldown is in progress in accordance with EOP-2.1, *Post LOCA Cooldown and Depressurization*.
- The following table is a plot of the cooldown:

<u>TIME</u>	<u>RCS TCOLD</u>	<u>TIME</u>	<u>RCS TCOLD</u>
0800	547°F	0945	425°F
0815	530°F	1000	395°F
0830	520°F	1015	382°F
0845	505°F	1030	364°F
0900	498°F	1045	340°F
0915	478°F	1100	310°F
0930	447°F	1115	280°F

At which time was the Tech Spec RCS Cooldown rate limit FIRST exceeded?

- A. 0915.
- B. 0930.
- C. 1000.
- D. 1115

59. Given the following plant conditions:

- A LOCA outside containment has occurred.
- The crew is performing the actions in EOP-2.5, *LOCA Outside Containment*.

Which ONE (1) of the following actions will be attempted to isolate the break and which indication is used to determine if the leak has been isolated in accordance with EOP-2.5?

A. Isolate low pressure Safety Injection piping.

RCS pressure is monitored, because SI flow will repressurize the RCS when the break is isolated.

B. Isolate low pressure Safety Injection piping.

PZR level is monitored, because when the break is isolated, RCS inventory will rapidly rise.

C. Isolate high pressure Safety Injection piping.

RCS pressure is monitored, because SI flow will repressurize the RCS when the break is isolated.

D. Isolate high pressure Safety Injection piping.

PZR level is monitored, because when the break is isolated, RCS inventory will rapidly rise.

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60. Which ONE (1) of the following describes the reason that a RED condition on the Integrity CSF Status Tree may develop while performing actions of EOP-14.1, *Response to Degraded Core Cooling*?
- A. Core Exit Thermocouple temperature will decrease rapidly when Low Head SI Pumps are started and SI flow is initiated.
  - B. Core Exit Thermocouple temperature will decrease rapidly when SG depressurization and SI Accumulator injection occur.
  - C. RCS Cold Leg temperature will decrease rapidly when Low Head SI Pumps are started and SI flow is initiated.
  - D. RCS Cold Leg temperature will decrease rapidly when SG depressurization and SI Accumulator injection occur.

61. Given the following plant conditions:

- A LOCA has occurred.
- The crew is performing actions contained in EOP-2.0, *Loss of Reactor or Secondary Coolant*.
- The following conditions currently exist:
  - Integrity - RED
  - Containment - RED
  - Subcriticality - ORANGE
  - Core Cooling - ORANGE
  - Inventory - YELLOW
  - Heat Sink - YELLOW

Which ONE (1) of the following describes the correct procedure flowpath for these conditions?

- A. EOP-17.0, *Response to High Reactor Building Pressure*, followed by EOP-16.0, *Response to Imminent Pressurizer Thermal Shock Condition*.
- B. EOP-16.0, *Response to Imminent Pressurizer Thermal Shock Condition*, followed by EOP-17.0, *Response to High Reactor Building Pressure*.
- C. EOP-14.1, *Response to Degraded Core Cooling*, followed by EOP-16.0, *Response to Imminent Pressurizer Thermal Shock Condition*.
- D. EOP-16.0, *Response to Imminent Pressurizer Thermal Shock Condition*, followed by EOP-14.1, *Response to Degraded Core Cooling*.

62. Given the following plant conditions:

- A reactor trip has occurred due to a loss of offsite power.
- The crew is performing actions of EOP-1.4, *Natural Circulation Cooldown with Steam Void in Vessel*.
- During the event, RCP seal cooling was lost, but subsequently restored.
- The operating crew is preparing to initiate the RCS cooldown.

The following conditions are indicated:

- RVLIS NR level is 89%.
- RCS subcooling is 60°F.
- PZR Level is 72% and stable.

Which ONE (1) of the following actions is required in accordance with EOP-1.4?

- A. Use PZR Heaters as necessary to saturate PZR water and continue in EOP-1.4.
- B. Initiate Safety Injection and go to EOP-1.0, *Reactor Trip Or Safety Injection*.
- C. Start a RCP and go to the applicable portion of the appropriate GOP.
- D. Return to EOP-1.3, *Natural Circulation Cooldown*.

63. Given the following plant conditions:

- A LOCA has occurred.
- Due to low RHR Sump Level, the crew has transitioned from EOP-2.2, *Transfer to Cold Leg Recirculation*, to EOP-2.4, *Loss Of Emergency Coolant Recirculation*.
- All automatic actions occurred as designed.
- Two Charging pumps and two RHR pumps are running.
- Both RB Spray Pumps are running.
- RHR, Charging, and RB Spray pump amps and flow are stable.
- RWST level is approximately 5% and continues to lower.

Which ONE (1) of the following describes how the Charging, RHR, and RB Spray pumps should be operated in accordance with EOP-2.4?

	<u>Charging Pumps</u>	<u>RB Spray Pumps</u>	<u>RHR Pumps</u>
A.	Stop BOTH	Leave BOTH running	Leave BOTH running
B.	Stop ONE	Stop BOTH	Stop ONE
C.	Stop BOTH	Stop BOTH	Stop BOTH
D.	Leave BOTH running	Leave BOTH Running	Stop ONE

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64. The crew is performing actions of EOP-3.1, *Uncontrolled Depressurization of All Steam Generators*.

Which ONE (1) of the following describes the Technical Specification implications of the event?

- A. RCS cooldown rates above 100°F per hour may potentially result in non-ductile failure of the reactor vessel.
- B. Pressurizer cooldown rates above 100°F per hour may potentially result in pressurized thermal shock to the pressurizer.
- C. Loss of SG inventory may ultimately result in the RCS Pressure Safety Limit being exceeded.
- D. Loss of SG inventory may ultimately result in the Reactor Core Safety Limit being exceeded.

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65. Which ONE (1) of the following describes the status of RB ventilation and RBCU's upon completion of the actions contained in EOP-17.2, *Response to High Reactor Building Radiation Level*?
- A. RB Purge isolated  
All RBCU fans in SLOW
  - B. RB Purge isolated  
RBCU fans selected on switch RBCU TRAIN A/B EMERG, running in SLOW
  - C. RB Mini Purge in service  
All RBCU fans in SLOW
  - D. RB Mini Purge in service  
RBCU fans selected on switch RBCU TRAIN A/B EMERG, running in SLOW

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66. In accordance with OAP-100.4, *Communication*, which ONE (1) of the following communications should use the phonetic alphabet?
- A. Communications involving safety system trains. (Train Alpha)
  - B. Communications involving manipulation of plant components. (Alpha Charging Pump)
  - C. Communications describing Containment Isolation (Phase Bravo)
  - D. All communications that are not 'information only'.

67. Given the following plant conditions:

- The plant is at 46% power and increasing IAW GOP-4A, *Power Operation (Ascending)* at 3% per hour.
- A loss of Feedwater occurs.
- All three S/G NR levels are at 5% and lowering.
- It is now 60 seconds later.

Which ONE (1) of the following is the expected response of the ATWS Mitigation System Actuation Circuitry (AMSAC)?

- A. AMSAC will NOT actuate because it is not armed.
- B. AMSAC will TRIP the reactor and START the EFW pumps.
- C. AMSAC will NOT actuate because the time delay on reactor power has not timed out.
- D. AMSAC will TRIP the main turbine and START the EFW pumps.

68. Given the following plant conditions:

- An RCS leak is in progress.
- The crew is performing the appropriate AOP for the plant condition.
- Letdown is isolated.
- Charging flow is maximized.
- RCS pressure is 1990 psig and lowering.
- Reactor Building pressure is 1.8 psig and rising.
- Pressurizer level is 18% and lowering.
- VCT level is 15% and lowering.

Which ONE (1) of the following describes the status of the plant and the action required?

- A. An RPS setpoint has been exceeded. Trip the Reactor and initiate Safety Injection when immediate actions of EOP-1.0 have been completed.
- B. An RPS setpoint has been exceeded. Trip the reactor and concurrently perform actions of the in-use AOP when immediate actions of EOP-1.0 have been completed.
- C. An RPS setpoint has NOT been exceeded, Trip the Reactor, perform the immediate actions of EOP-1.0, then initiate Safety Injection.
- D. An RPS setpoint has NOT been exceeded, Trip the Reactor, perform the immediate actions of EOP-1.0, continue to implement the AOP concurrently, then initiate Safety Injection when Pressurizer level is <12%.

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69. The unit is at 100% power.  
All systems are in normal alignments.

Which ONE (1) of the following activities requires entry into a technical specification LCO action statement?

- A. CCW Pump B mechanical seal repair.
- B. Charging Pump A removal from service for oil change.
- C. Boric Acid Transfer Pump recirc valve leak repair.
- D. RHR Heat Exchanger Discharge flow control valve repair.

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70. Which ONE (1) of the following describes the MINIMUM Source Range Nuclear Instrumentation requirement that must be met prior to off-loading fuel from the reactor vessel?

	<u>Visual in control room</u>	<u>Audible in control room</u>	<u>Audible in RB</u>
A.	1	1	1
B.	2	1	1
C.	2	2	1
D.	2	2	2

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71. Given the following information:

- A 27 year old new V.C Summer employee has a fully completed NRC Form 4 and a 2007 radiation exposure history as follows:
  - 2650 millirem from previous employment with Progress Energy in 2007.
  - 110 millirem since becoming a V.C. Summer employee.

Which ONE (1) of the following describes the MAXIMUM ADDITIONAL exposure the employee may receive prior to reaching his MAXIMUM Administrative Dose Control Limit, including any applicable extensions, IAW HPP-0153, *Administrative Exposure Limits*?

- A. 1240 millirem
- B. 1350 millirem
- C. 2240 millirem
- D. 2350 millirem

72. Given the following plant conditions:

- A General Emergency exists.
- The TSC is manned.
- A valve in the Aux Building must be closed to prevent damage to valuable safety related equipment.
- Radiation levels are extremely high.

Which ONE (1) of the following describes the maximum dose that is allowed to perform this operation and whose permission is required?

An individual may receive . . .

- A. Up to 10 Rem with permission from the Duty SS
- B. 25 Rem, or more, with permission from the Duty SS
- C. Up to 10 Rem with permission from the ED
- D. 25 Rem, or more, with permission from the ED

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73. Given the following plant conditions:

- A reactor trip and safety injection have occurred.
- Off-Site power is lost subsequent to safety injection actuation.
- Equipment failures during performance of EOP-2.0, *Loss of Reactor or Secondary Coolant*, resulted in the following conditions:
  - Bus 1DA is de-energized due to a fault.
  - CSF Status Trees indicate as follows:
    - Subcriticality      GREEN
    - Core Cooling      ORANGE
    - Heat Sink          RED
    - Integrity          GREEN
    - Containment      YELLOW
    - Inventory          YELLOW

Which ONE (1) of the following describes the requirement for Critical Safety Function Status Tree Monitoring in accordance with OAP-103.04, *EOP/AOP User's Guide*?

- A. Continuous monitoring is required.
- B. Monitor every 5 - 10 minutes unless a change in status occurs.
- C. Monitor every 10 - 20 minutes unless a change in status occurs.
- D. Monitored for information only.

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74. Given the following plant conditions:

- T=0 A fire is occurring in the Aux Building 436'.
- T+2 Fire Brigade Leader reports to the scene.
- T+15 Notification of Unusual Event declared.

In accordance with EPP-013, *Plant Fire*, who, by title, is coordinating the fire fighting efforts with the Fire Brigade Leader?

- A. Shift Supervisor
- B. Emergency Director
- C. OSC Supervisor
- D. Health Physics Shift Leader

75. Given the following plant conditions:

- The Unit is in Mode 5.
- RCS Drain Down to Mid Loop is in progress in preparation for welding on a Hot Leg opening.
- RHR Pump A is in service.
- During the drain down, RHR amps and discharge pressure begin fluctuating erratically.
- The crew enters AOP-115.1, *RHR Pump Vortexing*.
- The drain-down is stopped.

Which ONE (1) of the following describes the FIRST action that will be required in accordance with AOP-115.1?

- A. Reduce RHR flow.
- B. Align the RHR Pump to the RWST.
- C. Raise RCS level.
- D. Vent the operating RHR loop.