

INITIAL SUBMITTAL

**WATTS BAR EXAM
50-390, 391/2001-301**

**JANUARY 29 - FEBRUARY 6,
2001**

**INITIAL SUBMITTAL
RO/SRO WRITTEN EXAMINATION**

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

NAME _____

SSN _____

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- 2. (a) (b) (c) (d)
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**WATTS BAR NUCLEAR PLANT
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**WATTS BAR NUCLEAR PLANT
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1. 005AK3.02 001

Given the following plant conditions:

- Reactor is at 75% with a power increase in progress using control rods.
- The OAC determines that Control Bank D rod H-12 is not moving and is 14 steps below the other rods in D bank.
- Crew is performing AOI-2, "Malfunction of Reactor Control System" to realign control rod H-12 with the bank.

Which ONE of the following describes how control rod H-12 will be realigned to control bank D and how control bank insertion limit will change following the realignment?

- a. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be higher.
- ✓b. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be lower
- c. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be lower.
- d. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be higher.

2. 015AK1.05 001

Given the following plant conditions:

- Reactor power is stable at 30%
- Loop 1 RCP trips

Assuming reactor power remains constant, core exit temperature will:

- ✓a. increase, then stabilize at a higher value.
- b. decrease, then stabilize at a lower value.
- c. increase, then return to the original steady-state value.
- d. decrease, then return to the original steady-state value.

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3. 017AK3.03 001

Given the following conditions:

- Unit at 60% power.
- Confirmed Loop 1 RCP shaft vibration of 25 mils.

Which ONE of the following statements is correct per AOI-5, "Unscheduled Removal of One RCP", regarding the sequence of actions?

- a. RCP should be tripped prior to the reactor trip to minimize pump damage.
- b. The reactor should be tripped prior to tripping the RCP to prevent pressurizer level from dropping below 17%.
- c. RCP should be tripped prior to the reactor trip to prevent Reactor Coolant Bus voltage from dropping and tripping additional RCPs.
- ✓d. The reactor should be tripped prior to tripping the RCP to prevent an automatic trip and an unnecessary challenge to a safety system.

4. 017AA1.13 001

Given the following plant conditions:

- Unit was operating at 58% power.
- Problems with #4 RCP required the pump to be shut down in accordance with AOI-5, "Unscheduled Removal of One RCP".

AOI-5 requires the plant to be in which ONE of the following conditions for restart of #4 RCP?

- ✓a. < P-10.
- b. < P-9.
- c. < P-8.
- d. Mode 3.

**WATTS BAR NUCLEAR PLANT
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5. 024AK1.02 001

Given the following plant conditions:

- Plant was operating at 100% power when a Main Feedwater pump trip resulted in a turbine runback.
- All systems in automatic and responded as expected to stabilize the plant.
- Control rods inserted beyond the Lo-Lo Rod Insertion limits.
- Operators implemented AOI-34, "Immediate Boration", in accordance with the ARI.

Which ONE of the following indicates the final, stable plant conditions AFTER completion of the boration as compared to those PRIOR to the boration?

	<u>Reactor Power</u>	<u>Rod Position</u>	<u>Tavg</u>
a.	Same	Higher	Higher
✓b.	Same	Higher	Same
c.	Lower	Lower	Same
d.	Lower	Lower	Lower

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6. 027AK3.02 001

Given the following plant conditions:

- The Unit is at 100% load.
- Pressurizer pressure channel selector switch, 1-XS-68-340D, is in the PT-68-340 & 334 position.
- Instrument Maintenance has 1-PT-68-323 (CH III) OOS for a loop calibration.
- PZR Pressure transmitter, 1-PT-68-334 (CH II) has just failed AS IS.
- The operating crew implements AOI-18, "Malfunction of Pressurizer Pressure Control System".

Which ONE of the following channels will be selected on 1-XS-68-340D and position of the master controller following completion of AOI-18, Malfunction of Pressurizer Pressure Control System?

- a. Channel I and III selected with 1-PIC-68-340A in AUTO.
- b. Channel I and III selected with 1-PIC-68-340A in MANUAL.
- ✓c. Channel I and IV selected with 1-PIC-68-340A in AUTO.
- d. Channel I and IV selected with 1-PIC-68-340A in MANUAL.

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7. 027AA2.12 001

Given the following plant conditions:

- Plant is operating at 100% power.
- One pressurizer safety valve failed full OPEN.
- Operating crew initiated reactor trip/safety injection and entered the EOPs.
- Safety Injection signal is not reset.

Which ONE of the following is the status of Pressurizer level and pressure control 10 minutes following the reactor trip/safety injection?

- a. PZR level indication offscale LOW.
PZR heaters ON.
- b. PZR level indication offscale LOW.
PZR heaters OFF.
- c. PZR level indication offscale HIGH.
PZR heaters ON.
- ✓d. PZR level indication offscale HIGH.
PZR heaters OFF.

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8. 057AA1.05 001

Given the following plant conditions:

- Plant is operating at 100% power.
- A loss of 120V AC Vital Instrument Power Board 1-I occurred.
- The crew implements AOI-25.01, "Loss of 120V AC Vital Instrument Power Board 1-I".

Which ONE of the following identifies the train selector switches that must be selected for automatic control of feedwater and which loop 1 feedwater/steam flow indications are available?

	<u>Feedwater/Steam Flow Selector Switches</u>	<u>Feedwater/Steam Flow Indications</u>
a.	A train	Channel I
b.	A train	Channel II
c.	B train	Channel I
✓d.	B train	Channel II

**WATTS BAR NUCLEAR PLANT
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9. 068G2.3.10 001

Given the following:

- Committed Dose Equivalent (CDE) is 1875 mrem
- Deep Dose Equivalent (DDE) is 1620 mrem
- Lens Dose Equivalent (LDE) is 430 mrem
- Committed Effective Dose Equivalent (CEDE) is 260 mrem
- Total Organ Dose Equivalent (TODE) is 3685 mrem
- Shallow Dose Equivalent (SDE) is 295 mrem

What is the Total Effective Dose Equivalent (TEDE)?

- a. 3980 mrem
- b. 2170 mrem
- c. 1915 mrem
- ✓d. 1880 mrem

10. 069AK2.03 001

Which ONE of the following conditions concerning the Personnel Airlock would exceed a Limiting Condition for Operation and require entering an Action Statement of Technical Specifications?

- a. The lower containment airlock fails its LLRT while control rod unlatching is in progress.
- b. Welding cables are laid through both lower containment airlock doors during RCS fill and vent at the end of an outage.
- c. The lower containment airlock door interlocks are defeated while reactor vessel head is being tensioned.
- ✓d. The outer and inner doors are opened simultaneously during a normal cooldown prior to aligning RHR to the RCS.

**WATTS BAR NUCLEAR PLANT
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11. 074EK1.03 001

Given the following plant conditions:

- Inadequate core cooling conditions exist
- Crew is performing FR-C.1, Inadequate Core Cooling

Which ONE of the following sets of actions states the proper sequence of the major action categories to be performed for removing decay heat from the core?

- a. Rapid secondary depressurization; reinitiation of high head safety injection; RCP restart
- ✓b. Reinitiation of high head safety injection; rapid secondary depressurization; RCP restart
- c. Rapid secondary depressurization; RCP restart; reinitiation of high head safety injection
- d. RCP restart; rapid secondary depressurization; reinitiation of high head safety injection

12. 076AA1.04 001

Which ONE of the following correctly describes the indication on the main steam line radiation monitors when the MR/HR AUTO pushbutton is lit on the RM-23 readout module?

- a. Indicates low range output only.
- ✓b. Indicates high range output only.
- c. Automatically switches between the low and high range outputs every 45 seconds.
- d. Automatically switches between low and high range output based upon activity level in order to maintain accurate indication.

**WATTS BAR NUCLEAR PLANT
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13. EO6EK2.1 001

Given the following plant conditions:

- Operators are responding to a large break LOCA and have determined that degraded core cooling conditions exist.
- The crew has implemented FR-C.2, "Degraded Core Cooling".
- Preparations are in progress to depressurize all intact S/Gs to atmospheric pressure in accordance with FR-C.2.

Which ONE of the following is the reason the procedure directs all RCPs be stopped prior to performing the depressurization?

- a. Reduces the core ΔP which will enhance the ability of the RHR pumps to inject into the core.
- b. Minimizes heat input to the S/Gs allowing them to depressurize faster.
- c. Limits heat removal requirements to the core decay heat only.
- ✓d. Anticipates a loss of RCP #1 seal ΔP requirements.

14. E07EK2.1 001

Given the following plant conditions:

- A large break LOCA has occurred that resulted in saturated core cooling conditions.
- RWST level is 28%
- Crew is performing step 4 of FR-C.3, Saturated Core Cooling to establish SI pump valve alignment.

Which ONE of the following identifies valves that should be verified CLOSED during performance of this step?

- a. FCV-63-6, 7 and 177, SI pump and Charging pump suction from RHR.
- b. FCV-63-47 and 48, SI pump suction valves
- c. FCV-63-152 and 153, SI pump cold leg injection cross-tie valves
- ✓d. FCV-63-3, 4 and 175 SI pump mini-flow valves

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15. E10EA2.1 001

Given the following plant conditions:

- Reactor trip occurred with subsequent loss of RCPs.
- Operators have implemented ES-0.2, "Natural Circulation Cooldown".
- A cooldown rate of 25°F/hour has been established.
- RCS depressurization has been initiated while maintaining subcooling > 165°F.
- Operators are monitoring PZR level and RVLIS for void formation.
- The OAC observes that loss of inventory in the Condensate Storage Tank is imminent.

Which ONE of the following describes the appropriate procedural actions?

- a. Stop the cooldown and remain in ES-0.2.
- b. Raise the cooldown rate and remain in ES-0.2.
- c. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and lower the cooldown rate.
- ✓d. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and raise the cooldown rate.

16. E14EK3.2 001

Which ONE of the following describes the reason for tripping all RCPs during the performance of FR-Z.1, "High Containment Pressure"?

- a. Removes heat transferred to the Containment atmosphere from the RCP motors.
- b. Prevents depletion of primary inventory out of the break during a small LOCA.
- ✓c. Containment Isolation Phase B isolates cooling water to the RCPs and thermal barriers.
- d. Removes additional energy to the RCS during a break and subsequent release to containment.

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17. 003AA2.01 001

Given the following plant conditions:

- Unit is stable at 55% power.
- Recovery of dropped rod D-4 (Control Bank D, Group 1) is in progress.
- D-4 is at 50 steps.
- Remaining Bank D rods are at 125 steps.

Which ONE of the following Control Bank D indications will update as withdrawal of the dropped rod continues?

- a. Both Bank D step counters and P/A converter
- b. Both Bank D step counters and Bank Overlap counter
- ✓c. Only Group 1 step counter and P/A converter
- d. Only Group 1 step counter and Bank Overlap counter

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18. 007EK2.02 001

Given the following plant conditions:

- Unit 1 operating at 22% power.
- Reactor Trip Breakers "A" & "B" closed.
- Bypass Breaker B is racked in and closed.
- "B" Train SSPS Input Error Inhibit Switch is in INHIBIT for surveillance testing.

Which ONE of the following describes the response of the Reactor Trip and Bypass Breakers if RCS pressure drops below the Low Pressure Reactor trip setpoint with no operator action?

- a. Reactor Trip Breakers "A" & "B" open, Bypass Breaker "B" opens.
- b. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" remains closed.
- c. Reactor Trip Breaker "B" opens and "A" remains closed, Bypass Breaker "B" opens.
- ✓d. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" opens.

**WATTS BAR NUCLEAR PLANT
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19. 008AK1.01 001

Given the following plant conditions:

- Unit was at 100% power.
- All systems operating in automatic and all plant parameters at their normal values.
- 1-PCV-68-340 failed partially open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 45 psig?

- a. 228°F.
- b. 250°F.
- c. 275°F
- ✓d. 290°F

20. 008G2.2.25 001

According to the safety limit technical specification basis for RCS pressure, the maximum transient pressure allowed is:

- ✓a. 110% of design pressure.
- b. 110% of normal operating pressure.
- c. 125% of design pressure.
- d. 125% of normal operating pressure.

**WATTS BAR NUCLEAR PLANT
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21. 011EK2.02 001

Given the following conditions:

- A large break LOCA occurred
- Operators have just completed swapper to Containment Sump
- A loss of offsite power occurs

Which ONE of the following describes the actions required for this condition?

- a. Pull to lock SI pumps and CCPs until the RHR pumps have been restarted after the shutdown boards are reenergized.
- ✓b. Pull to lock the CCPs until the RHR pumps are restarted after the shutdown boards are reenergized.
- c. Ensure both RHR pumps are started by the blackout sequencer after the diesel generators reenergize the shutdown boards then restart the SI pumps.
- d. Ensure all ECCS pumps are started by the blackout sequencer when the diesel generators reenergize the shutdown boards.

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22. 029EA1.02 001

Given the following plant conditions:

- ATWS without Safety Injection has occurred.
- Crew has implemented FR-S.1, "Nuclear Power Generation/ATWS", and currently performing step 4 to borate the RCS.

Which ONE of the following identifies the correct Operator action that must be taken in order to align charging pump suction?

- a. CLOSE LCV-62-132 and 133, VCT outlet isolation, then OPEN LCV-62-135 and 136, RWST supply to charging pump suction.
- ✓b. OPEN LCV-62-135 and 136, RWST supply to charging pump suction, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- c. Verify LCV-62-135 and 136, RWST supply to charging pump suction AUTO OPEN, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- d. Verify LCV-62-135 and 136, RWST supply to charging pump suction and LCV-62-132 and 133, VCT outlet isolation AUTO OPEN.

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23. 032AK3.02 001

Given the following plant conditions:

- The Unit is in MODE 6.
- Source Range Monitor (SRM) NI-132 has failed LOW resulting in a loss of the audio count rate signal.

WHICH ONE of the following describes the actions necessary to restore the audio count rate signal to the control room.

- ✓a. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N31 position.
- b. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N32 position.
- c. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A1 position.
- d. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A2 position.

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24. 033AA1.01 001

Given the following plant conditions:

- A Reactor startup in progress.
- Reactor power is stable at $2 \times 10^{-2}\%$ power on the Intermediate Range
- Intermediate Range channel N-135 was declared inoperable and removed from service per AOI-4, "Nuclear instrumentation Malfunction".

Which ONE of the following describes the plant response if an I&C Technician mistakenly removes the control power fuses for N-135 during troubleshooting activities?

- ✓a. The trip bistable deenergizes and a reactor trip occurs because power is below P-10.
- b. The trip bistable deenergizes, however NO trip occurs because N-135 is bypassed.
- c. The trip bistable energizes, however NO trip occurs because N-135 is bypassed.
- d. The trip bistable energizes and a reactor trip occurs because power is below P-10.

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25. 038EK1.01 001

Given the following plant conditions:

- Steam Generator Tube Rupture has occurred.
- Crew has implemented E-3, "Steam Generator Tube Rupture".
- The operators have completed cooldown to target incore temperature of 480°F.

Which ONE of the following identifies the pressure that steam dumps will be set to control RCS temperature at 480°F?

- a. 580 - 585 psig.
- ✓b. 550 - 555 psig.
- c. 580 - 585 psia.
- d. 550 - 555 psia.

26. 058AK3.01 001

Given the following plant conditions:

- AUO reports Emergency Diesel Generator (D/G) 1A-A has lost 125V DC control power from it's associated Diesel Battery Distribution Panel
- D/G 1A-A is NOT running.

Which ONE of the following describes how this loss of DC control power would affect D/G operation?

- a. D/G would start in response to an automatic or manual start signal.
- ✓b. D/G cannot be started by automatic or manual start signal.
- c. D/G can only be started manually from local control panel.
- d. D/G can only be started manually from the MCR panel.

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27. 059AK1.01 001

Given the following plant conditions:

- Plant is operating a 100% power.
- Plant systems aligned and operating normally.
- Annunciator, CCS HX A 1-RM-90-123 LIQ RAD HIGH, is in alarm.

Which ONE of the following lists the type and source of radiation sensed by the radiation monitor that is in alarm?

- ✓a. Gamma; Thermal Barrier leakage.
- b. Beta; Thermal Barrier leakage.
- c. Gamma; RCP motor cooler leakage.
- d. Beta; RCP motor cooler leakage.

28. 060AA2.04 001

Given the following plant conditions:

- A Gas Decay Tank release in progress with ABGTS running for dilution air flow.
- A leak occurs on the waste gas compressor which results in a gas release to the Auxiliary Building.
- 0-RE-90-101, Auxiliary Building Vent Monitor, is in alarm.

Which ONE of the following indicates the effect this leak will have on the plant?

- a. Gas Decay Tank release will be terminated; ABGTS will be stopped.
- b. Gas Decay Tank release will be terminated; ABGTS will continue to run.
- c. Gas Decay Tank release will continue; ABGTS will be stopped.
- ✓d. Gas Decay Tank release will continue; ABGTS will continue to run.

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29. E01EK3.4 001

Once an operating crew has entered the EOP network, which ONE of the following is the earliest that a transition may be made to ES-0.0, "Rediagnosis"?

- ✓a. AFTER transition from E-0 and safety injection initiated.
- b. AFTER transition from E-0 and NO safety injection initiated.
- c. BEFORE transition from E-0 and safety injection initiated.
- d. BEFORE transition from E-0 and NO safety injection initiated.

30. E03EK1.3 001

Given the following plant conditions:

- A small break LOCA has occurred
- 1B-B CCP and SIP failed to start and could not be started manually.
- E-1 is completed and transition to ES-1.2, "Post LOCA Cooldown and Depressurization", made.
- 6.9kV Shutdown Board 1A-A is de-energized due to a fault
- The following conditions are noted by the OAC
 - RCS pressure is 1600 psig
 - Containment pressure is 6 psig

Which ONE of the following describes the action that should be taken and the basis for that action?

- a. All RCPs should be stopped to limit heat input during the RCS cooldown.
- ✓b. All RCPs should be stopped because Phase B isolation has occurred.
- c. All RCPs should NOT be stopped because no CCP or SIP is injecting into the RCS.
- d. All RCPs should NOT be stopped because the RCS pressure is above 1500 psig.

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31. E03EK2.2 001

Which ONE of the following is the significance of draining the SG U-tubes and blowing the inverted "loop seal" during a cold leg small break LOCA?

- a. A steam vent path is established from the core to the break location and mass loss from the system is decreased.
- b. Core cooling will be lost after the loop seal is blown due to increased injection flow being diverted to the break location.
- c. RCS pressure control will be lost resulting in a challenge to Pressurized Thermal Shock limits.
- d. The heat sink effect of the water in the "crossover" leg is lost when the loop seal is lost resulting in a degraded core cooling.

32. E05EK2.1 001

Given the following plant conditions:

- Reactor trip and safety injection occurred.
- The crew implemented FR-H.1, "Loss of Secondary Heat Sink" due to heat sink red path.
- Operators are preparing for main feedwater startup.

Which ONE of the following lists the minimum actions required to reset Main Feedwater Pump 1A?

- a. Reset safety injection and cycle reactor trip breakers.
- b. Reset safety injection and reset feedwater isolation signal.
- c. Cycle the reactor trip breakers and reset feedwater isolation signal.
- d. Reset safety injection, cycle reactor trip breakers, and reset feedwater isolation signal.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

33. E11EA1.2 001

Given the following plant conditions:

- Reactor trip and SI occurred at 0200 due to a small LOCA.
- At 0300 the crew transitioned to ECA-1.1, "Loss of RHR Sump Recirculation", due to the failure of both RHR pumps.
- Crew has reduced ECCS flow to 1 SIP and 1 CCP per ECA-1.1.
- At 0500 the crew is performing step 17 RNO to establish the minimum required ECCS flow to remove decay heat.

Using Figure 1 from ECA-1.1, which ONE of the following flow rates would satisfy the intent of the RNO?

- a. 180 gpm
- ✓b. 210 gpm
- c. 240 gpm
- d. 280 gpm

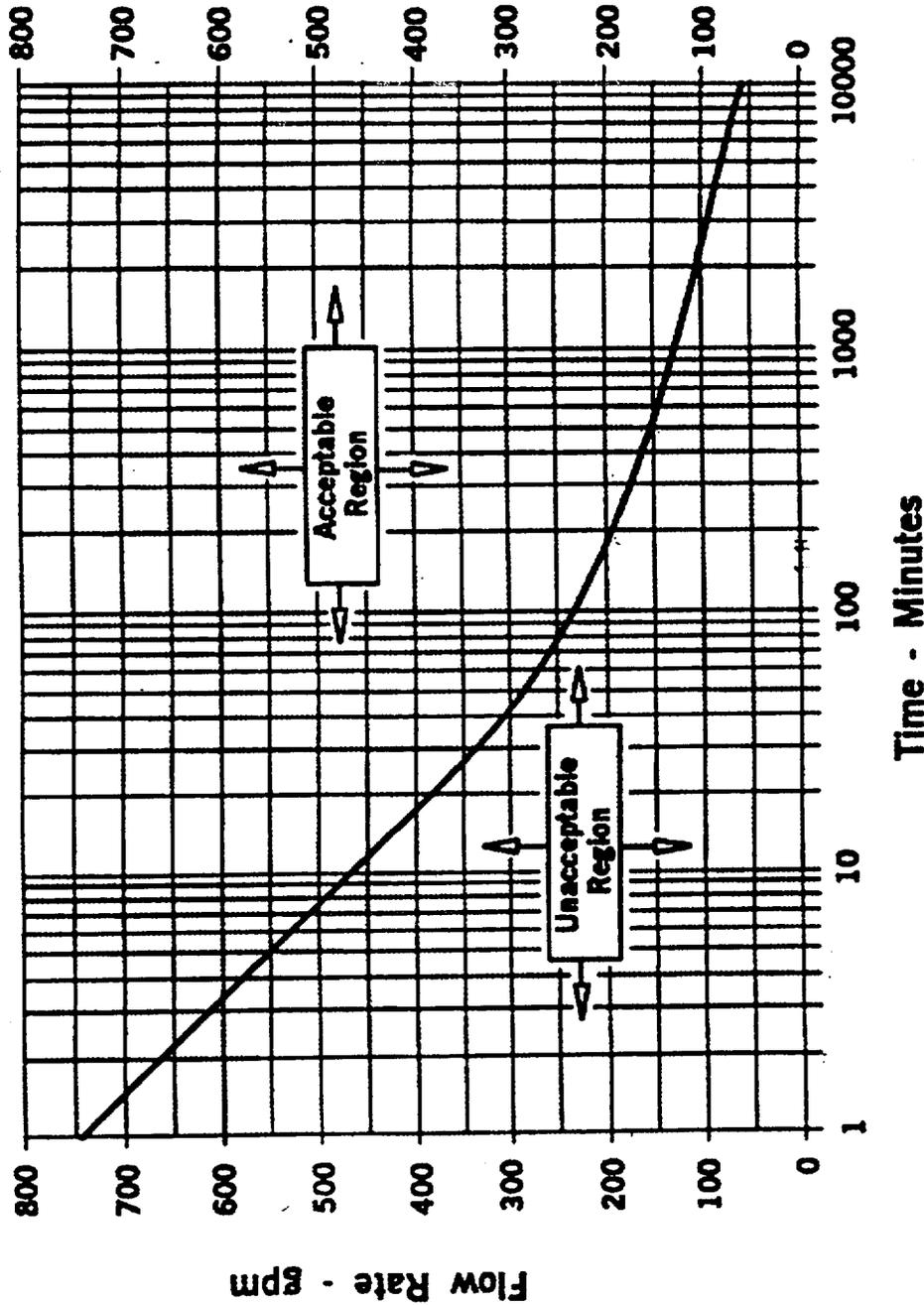
34. 036AK1.03 001

Which ONE of the following describes why the baseline count rate used for developing the 1/M plot must be re-calculated following movement of any source bearing fuel assembly ?

- a. Re-verify the operability of the source range instruments.
- ✓b. Ensures an accurate 1/M plot to monitor subcriticality.
- c. Determine adequate shutdown margin during refueling.
- d. Readjust the setpoint for the High Flux at Shutdown alarm.

Minimum SI Flow for Decay Heat vs. Time After Trip

FIGURE 1



ECA111

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

35. 056AK3.02 001

Given the following plant conditions:

- A Loss of offsite power has occurred.
- A Natural circulation cooldown is in progress.

Which ONE of the following describes how the loss of 2 CRDM fans will affect the cooldown?

- a. No effect, because the amount of RCS heat removal by running the fans is insignificant compared to that removed by steaming the secondary plant.
- b. Less subcooling is required, and the T-cold cooldown rate will be more.
- ✓c. More subcooling is required, and the T-cold cooldown rate will be less.
- d. The upper head will void, since there is not enough cooling available with only two CRDM fans to keep it subcooled.

36. 065AA1.04 001

Following an automatic start due to low instrument air pressure, which ONE of the following describes what will cause Aux Air Compressors to shutdown?

- ✓a. Running unloaded for 5 mins.
- b. Running unloaded for 10 mins.
- c. Low crankcase oil pressure.
- d. High discharge air temperature.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

37. 001K5.28 001

Given the following plant conditions:

- The Unit is at 1% power after an extended shutdown.
- Core burnup is 2000 MWD/MTU.
- RCS boron concentration is 1000 ppm.
- Control rods at 175 steps
- The STA has determined that 236 pcm of reactivity must be added to increase power to 10%.

Using the attached NUPOP curve and assuming no control rod movement, which ONE of the following identifies the final boron concentration of the RCS after the reactivity change has been made?

- a. 966 ppm
- b. 969 ppm
- c. 1031 ppm
- d. 1034 ppm

38. 001K6.02 001

Unit is operating at 100% power with all systems in their normal configuration, when Auctioneered High Tavg fails LOW.

Which ONE of the following describes the plant response?

- a. Control rods will step in; Charging Flow Control valve, 1-FCV-62-93, opens.
- b. Control rods will step out; Charging Flow Control valve, 1-FCV-62-93, closes.
- c. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, opens.
- d. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, closes.

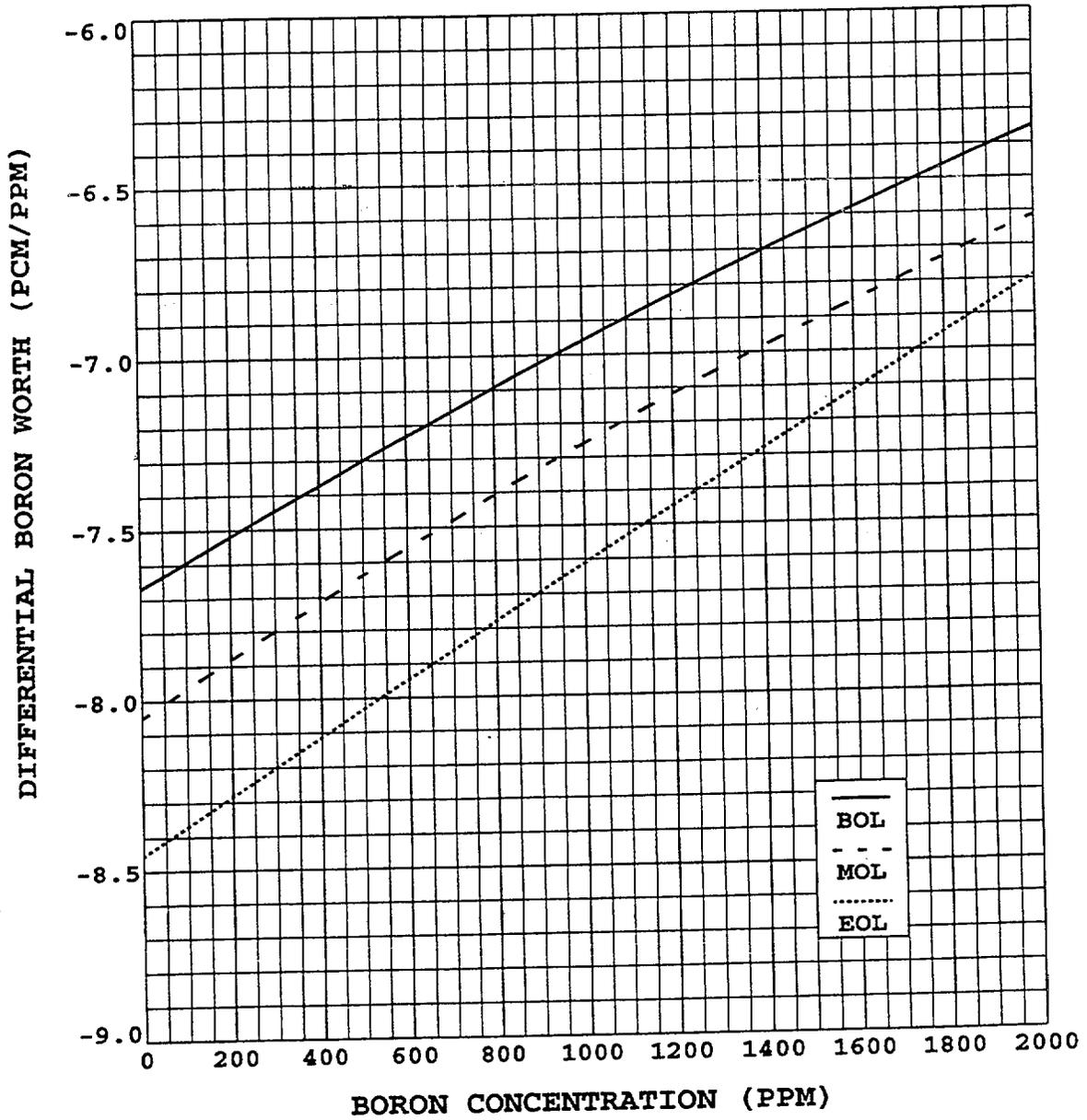


Figure 6-22 Differential Boron Worth Versus Boron Concentration at BOL, MOL, and EOL, HZP, With No Xenon

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

39. 003A1.08 001

Given the following plant conditions:

- The Unit is operating at 100% power.
- All systems are operating normal.
- Annunciator "RCP #1 Seal Outlet Temp Hi" alarm actuates.
- The operator verifies that ALL RCP seal temperatures are 180°F rising.

Which ONE of the following is the most probable cause of this alarm?

- a. The Charging Pump suction has swapped to the RWST.
- b. The operator has just placed Excess Letdown in service at maximum flow rate.
- ✓c. The Letdown Heat Exchanger temperature control valve 1-TCV-70-192 has failed closed.
- d. A loss of control air to charging flow control valve 1-FCV-62-93.

40. 003G2.4.6 001

Which ONE of the following describes why the RCPs are tripped if the low pressure trip criteria is reached during a small-break LOCA?

- a. Eliminate heat input from the RCPs into the RCS.
- b. Limit hydrogen buildup which could preclude core cooling.
- c. Steam may be present in the RCS which will cause RCP impeller damage from cavitation.
- ✓d. Excessive depletion of RCS water inventory might lead to core uncover if RCPs are tripped later in the accident.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

41. 004K3.01 001

Given the following conditions:

- Reactor power 35%.
- Turbine load 32%
- Control Rods are in AUTOMATIC.
- CVCS Mixed Bed A was placed in service resulting in a T-avg increase to 571°F.

Which ONE of the following describes the response of the rod control system?
(assume no operator action)

- a. Rods will step in at 8 steps per minute.
- ✓b. Rods will step in at 40 steps per minute.
- c. Rods will step in at 64 steps per minute.
- d. Rods will step in at 72 steps per minute.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

42. 004K2.03 001

Given the following plant conditions:

- The unit is at 100% power with 1A-A CCP is in operation.
- A loss of offsite power occurs
- All appropriate loads sequence onto the Shutdown Boards
- The crew has implemented E-0, "Reactor Trip or Safety Injection"
- While the immediate actions are being completed, a safety injection signal (SI) is received.

Which ONE of the following describes the response of the Centrifugal Charging Pumps (CCPs)?

- a. 1A-A CCP load sheds on the SI signal, and both CCPs auto sequence on the shutdown boards.
- b. 1A-A CCP load sheds on the SI signal, and must be restarted manually by the operator.
- c. 1A-A CCP does not load shed on the SI signal, and 1B-B CCP auto sequences on the shutdown boards.
- ✓d. Both CCPs remain energized and running following the SI signal.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

43. 013K2.01 001

Given the following:

- 1A-A and 1B-B SI Pump breakers are "Racked In".
- A fuse blows in the NORMAL DC Trip circuit for the 1A-A SI pump.
- A safety injection (SI) actuation occurs.

Which ONE of the following describes the response of the SI Pumps to the SI signal?

- a. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start until the control power supply is transferred.
- b. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start and must be started from the MCR handswitch.
- ✓c. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped from the MCR.
- d. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped mechanically at the breaker.

44. 013K4.08 001

Which ONE of the following describes the logic for Safety Injection (SI) actuation handswitches and reset pushbuttons?

- a. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets both trains of SI.
- ✓b. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets only it's associated train of SI.
- c. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets only it's associated train of SI.
- d. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets both trains of SI.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

45. 015A2.03 001

Given the following plant conditions:

- Unit is operating at 75% power
- A plant transient has resulted in a xenon oscillation
- Control rods are currently at 216 steps on D bank

Which ONE of the following is the effect of the xenon oscillation on NIS and the action required to dampen the oscillation?

- ✓a. The oscillation affects AFD and is dampened by inserting control rods at its most positive peak.
- b. The oscillation affects AFD and is dampened by inserting control rods at its most negative peak.
- c. The oscillation affects QPTR and is dampened by dropping turbine load at its highest value.
- d. The oscillation affects QPTR and is dampened by dropping turbine load at its lowest value.

46. 015K6.01 001

Given the following plant conditions:

- Plant is at 25% power with shutdown in progress.
- Power range upper detector, N43A, fails HIGH.

Which ONE of the following identifies the method used to block the "At Power" reactor trips when turbine load is reduced to < 10%?

- a. Manually blocked when 3/4 operable power range channels < 10% power.
- ✓b. Auto blocked when 3/4 power range channels < 10% power.
- c. Manually blocked when 2/4 power range channels < 10% power.
- d. Auto blocked when 2/4 power range channels < 10% power.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

47. 017A3.01 001

Given the following plant conditions:

- A small break LOCA has occurred.
- The crew responded IAW EOPs and tripped the RCPs when required.
- The crew is currently in ES-1.2, "Post LOCA Cooldown And Depressurization".
- RCS pressure is 1490 psig.
- Wide range Tc's are 505°F and decreasing slowly.
- Wide range Th's are 515°F and decreasing slowly.
- Core exit thermocouples (CETC) are 551°F and stable.
- Containment pressure is 1.5 psig.
- SG levels are being maintained at 38%.
- SG pressures are 715 psig and decreasing slowly.

Which ONE of the following describes the status of natural circulation for the existing plant conditions?

- ✓a. Cannot be assured, since there is inadequate sub-cooling.
- b. Cannot be assured, since SG parameters are not satisfied.
- c. Cannot be assured, since CETCs are not decreasing.
- d. Exists since all natural circulation criteria are met.

48. 017K1.01 001

Which ONE of the following lists functions/components that receive input from the Core Exit Thermocouples?

- ✓a. ICCM plasma display, ICS, RVLIS recorder.
- b. ICS, Rod Insertion Limit computer, RVLIS recorder.
- c. ICCM plasma display, OT Δ T calculator, RVLIS recorder.
- d. Core quadrant average temperature, ICS, OP Δ T calculator.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

49. 022K4.03 001

Given the following plant conditions:

- Reactor trip & Safety Injection occurred due to Large Break LOCA.
- Containment ØB isolation has occurred.
- All systems responded normally.

Which ONE of the following describes the response of the Lower Compartment Coolers when ØB is reset?

- a. Fans in A-P-AUTO start .
Cooler ERCW isolation valves open.
- ✓b. Fans in A-P-AUTO start.
Cooler ERCW isolation valves remain closed.
- c. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves open.
- d. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves remain closed.

50. 022A4.02 001

Given the following plant conditions:

- Main Steam Line Break occurred inside containment causing a reactor trip and safety injection.
- Operators have implemented the EOPs.
- Containment pressure is 3.2 psig and dropping.
- OAC observes the "INSTR ROOM COOLER A/B FLOW LOW" alarm LIT.

Which ONE of the following ESFAS signals caused the Incore Instrument Room Cooling fans, circ pump, and chiller to shut down?

- a. Containment vent isolation (CVI).
- ✓b. ØA containment isolation.
- c. ØB containment isolation.
- d. Aux. Building Isolation (ABI)

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

51. 025A3.02 001

Given the following plant conditions:

- Large break LOCA has occurred causing a reactor trip and safety injection.
- OAC observes annunciator "Glycol Exp Tank Level Hi/Hi-Hi is LIT.

Which ONE of the following describes the most likely reason the annunciator is LIT?

- a. ØA closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- ✓b. ØA closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.
- c. ØB closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- d. ØB closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

52. 056K1.03 001

Given the following plant conditions:

- Plant startup in progress.
- Tavg is being maintained at 557°F by Steam dumps.
- Operators are preparing to take the reactor critical.
- Standby Main Feedwater Pump in service supplying the SGs.

Which ONE of the following is the reason why a Condensate Booster Pump should NOT be operated at this time?

- a. To prevent overfeeding steam generators.
- ✓b. To prevent lifting the high pressure feedwater heater relief valves.
- c. To prevent overpressurization and damage to the SG's feedwater preheat section.
- d. To prevent overpressurization and damage to the Standby Main Feedwater Pump suction piping.

53. 059K3.04 001

Given the following conditions:

- Unit is operating at 100% power.
- FCV-2-35, Condensate Short Cycle valve fails OPEN

Which ONE of the following describes the effect on reactor power and the correct operator response?

Reactor power will:

- a. Increase; Borate the RCS.
- ✓b. Increase; Reduce turbine load.
- c. Decrease; Dilute the RCS.
- d. Decrease; Raise turbine load.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

54. 059A4.12 001

Given the following plant conditions:

- The plant was operating at 85% RTP when a loss of offsite power occurred.
- The Emergency Diesel Generators started and re-energized the Shutdown Boards.
- The operators have implemented the EOPs.
- #4 SG PORV developed a large packing leak after opening following the reactor trip.
- The CRO has determined that the bypass feedwater isolation valves are CLOSED.

Which ONE of the following signals caused the bypass feedwater isolation valves to CLOSE?

- a. North valve vault level increasing to 4 inches due to the PORV packing leak.
- b. Lo-Lo S/G level as #4 S/G blows dry following MSIV isolation.
- ✓c. Tavg decreasing to 564° F following the reactor trip.
- d. AFW start signal following the blackout.

55. 061K5.02 001

Which ONE of the following describes the decay heat sources and design basis for the Auxiliary Feedwater (AFW) System during a loss of offsite power?

- a. Prevents relief through the PZR safety valves by removing core decay heat only.
- b. Prevents relief through the S/G safety valves by removing core decay heat only.
- ✓c. Prevents relief through the PZR safety valves by removing core decay heat and stored RCS heat .
- d. Prevents relief through the S/G safety valves by removing core decay heat and RCP heat.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

56. 071A1.06 001

Given the following plant conditions:

- Unit is at 100% power.
- "A" Waste Gas Compressor is in service.
- Pressure in the "in service" Waste Gas Decay Tank (WGDT) is 60 psig.
- No WGDT release is in progress
- The relief valve on the "in service" WGDT begins to experience seat leakage.

Which ONE of the following will provide the best indication that the relief valve on the WGDT is leaking?

- a. Increasing count rates on RM-90-101A, Auxiliary Building Vent Monitor.
- ✓b. Increasing count rates on RM-90-400, Shield Building Vent Monitor.
- c. FCV 77-119, Plant Vent Flow Control valve, isolates due to high radiation.
- d. The Waste Gas Vent Header pressure increases causing the Waste Gas Compressor to run continuously.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

57. 071G2.4.18 001

Given the following plant conditions:

- Loss of all Shutdown power occurred resulting in a reactor trip.
- Operators have implemented ECA-0.0, "Loss of Shutdown Power".
- RCS pressure is 280 psig.
- When RCS pressure could not be maintained > 280 psig, the Unit Supervisor directed the OAC to vent nitrogen from the accumulators.

Which ONE of the following identifies the basis for venting nitrogen from the accumulators?

- a. Prevents injection of additional inventory into the RCS which could result in a water solid condition and further degradation of the RCS pressure boundary.
- b. Prevents erratic RVLIS indications due to pressure pulses as the accumulators alternately start/stop injecting during RCS depressurization.
- c. Prevents sudden cooldown of the RCS cold legs by allowing accumulator injection to proceed more slowly along with depressurization of the RCS.
- ✓d. Prevents injection of nitrogen into the RCS which may impede further RCS pressure control.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

58. 072K1.02 001

Given the following plant conditions:

- A source check is being performed on Spent Fuel Pool Monitor (RE-90-102).
- Auto Block handswitches are in the OFF position.

Which ONE of the following will occur when the control switch is placed in "SOURCE CHECK"?

- a. The fuel handling area ventilation system is diverted to the suction of the EGTS system.
- b. The green light on the monitor goes out indicating that the monitor is being source checked.
- ✓c. Auxiliary Building Ventilation isolates, but no Auxiliary Building isolation signal is generated.
- d. A Containment Ventilation Isolation signal is generated.

59. 072A2.03 001

Given the following plant conditions:

- Plant is operating at 100% power
- Annunciator window 174E, "1-RR-90-1 Area Monitors Instr Malf" is in alarm.

Which ONE of the following conditions would cause the annunciation?

- ✓a. Internal power supply blown fuse on 1-RM-90-1, Spent Fuel Pit Area radiation monitor.
- b. Vent Isolation Rad Mon Block switch, 0-HS-90-136A1, selected to 1-130 and pulled.
- c. Function switch for 1-RM-90-102, Spent Fuel Pit monitor, in the Alarm Adj position.
- d. 1-RM-90-6, CCS HXs radiation monitor becomes saturated (offscale high).

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

60. 002K1.02 001

Given the following plant conditions:

- The reactor is at 100% power
- Rod control is in automatic.
- Power Range nuclear instrument N-42 fails HIGH.

Which ONE of the following describes the rod control and plant response?

- a. Rods move in until the power mismatch rate signal decays, then move out to the original position to correct the temperature error.
- ✓b. Rods move in until the power mismatch rate signal decays, then remain at the new position with a reduced T-avg.
- c. Rods move out until the power mismatch rate signal decays, then move in to the original position to correct the temperature error.
- d. Rods move out until the high power rod block is reached, then remain at the new position with a higher T-avg.

61. 002K4.05 001

Given the following plant conditions:

- Unit was at 100% power.
- A spurious Safety Injection occurs.
- Operators are responding per the EOP network and have just transitioned to ES-1.1, "SI Termination".
- Annunciators "PRT LEVEL HI/LO, PRESS HI, and TEMP HI" alarm.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

- a. Pressurizer PORVs, 1-PCV-68-340 and 334, have lifted.
- b. CVCS Letdown Header Relief valve, 1-RLF-62-662 has lifted.
- c. RHR Pump Discharge Relief valve, 1-RLF-63-620, has lifted.
- ✓d. RCP #1 Seal Leakoff Relief Valve, 1-RLF-62-636, has lifted.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

62. 010K6.04 001

Given the following plant conditions:

- Operating at 100% power.
- PZR PORV, PCV 68-340, is leaking through.
- PRT pressure increases resulting in rupture of the PRT diaphragm.

What effect will the rupture of the PRT diaphragm have on PRT temperature and leakage through the PORV?

	<u>PRT Temp</u>	<u>PORV Leakage</u>
a.	Rises	Rises
b.	Rises	Drops
✓c.	Drops	Rises
d.	Drops	Drops

63. 010A3.01 001

Given the following plant conditions:

- Unit is operating at 100% power.
- PZR PORV testing is in progress
- While Operators are raising PRT level to reduce PRT Oxygen content the PRT PRESS HI alarm annunciates.

Which ONE of the following automatic actions will occur?

- ✓a. The WDS vent header control valve PCV-68-301 will CLOSE.
- b. The primary water supply valve, FCV-68-303 will CLOSE.
- c. The PRT drain valve to RCDT FCV-68-310 will OPEN.
- d. The PRT nitrogen supply isolation valve FCV-68-305 will CLOSE.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

64. 012K5.02 001

Which ONE of the following would result in the OP Δ T reactor protection trip setpoint being reduced? Consider each parameter independently.

- a. ΔT increasing.
- ✓b. Tavg increasing.
- c. PRZ pressure decreasing.
- d. Reactor Power decreasing.

65. 012A2.04 001

Given the following plant conditions:

- The operating crew is responding to a reactor trip due to a loss of 120V AC Vital Instrument Power Bd I.
- PZR pressure transmitter 68-334 (Channel II) failed LOW.

Which ONE of the following describes the plant response?

- a. Both trains of SSPS SI master relays would actuate AND both trains of ECCS equipment auto start.
- ✓b. Both trains of SSPS SI master relays would actuate BUT only "B" train ECCS equipment auto start.
- c. Only the "B" train SSPS SI master relays would actuate BUT both trains of ECCS equipment auto start.
- d. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment auto start.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

66. 016K3.03 001

Given the following plant conditions:

- Unit is in Mode 3 with Tavg at 557°F.
- Steam Dump Mode selector switch in the STEAM PRESSURE mode.
- Pressure transmitter, 1-PT-1-33, fails HIGH

Which ONE of the following describes the effect on the Steam Dump system?

- a. Only six valves will open and remain open.
- b. Only six valves will open and then close when Tavg decreases to 550°F.
- c. Twelve valves will open and will remain open.
- ✓d. Twelve valves will open and then close when Tavg decreases to 550°F.

67. 016K5.01 001

Which ONE of the following correctly describes the operation of the Median Signal Select (MSS) circuitry associated with Steam Generator (S/G) controls and protection?

- a. The (MSS) averages three channels from each S/G and assigns all control and protection functions to the average values.
- b. The (MSS) looks at all three channels of each S/G, selects the median channel and assigns all protection and control functions to that channel.
- c. The (MSS) compares the Median value of all S/Gs, averages them, then uses this value for all control functions and allows all channels to retain their separation as protection channels.
- ✓d. The (MSS) looks at all three channels of each S/G, selects the median channel for control and allows all channels to retain their separation as protection channels.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

68. 026A2.09 001

Given the following plant conditions:

- Large break LOCA has occurred.
- Swapover to containment sump was unsuccessful and crew has implemented ECA-1.1, "Loss of RHR Sump Recirculation".
- Containment Spray has been aligned to the containment sump.
- Unit Supervisor has directed the OAC to initiate makeup to the RWST.

Which ONE of the following lists the preferred makeup source to the RWST?

- a. Transfer water from the Holdup Tank.
- b. Transfer water from the Spent Fuel Pit.
- ✓c. Align Containment Spray to the RWST.
- d. Align CVCS blender to makeup.

69. 029A1.02 001

Given the following plant conditions:

- Plant is in MODE 6 with refueling in progress.
- During movement of an irradiated fuel assembly from the core it is dropped and severely damaged.
- The containment airborne radioactivity increases.

Which ONE of the following describes the ESF actuation that would occur?

- a. Phase A Containment Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- b. Phase A Containment Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.
- c. Containment Vent Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- ✓d. Containment Vent Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

70. 035G2.4.34 001

Given the following plant conditions:

- Operators are performing AOI-27, "MCR Inaccessibility".
- Crew is ready to transfer controls back to MCR.
- Auxiliary Feedwater level controllers in the Aux. Control Room (ACR) are in automatic controlling S/G levels at 38%.

Which ONE of the following actions should be performed to prevent sudden changes in S/G levels when the controllers are transferred to the Main Control room (MCR)?

- a. Place MCR controller in automatic, this will allow it to automatically track the corresponding controller in the ACR.
- b. Plant conditions must be established to allow modulating components to be full open or closed prior to transfer.
- c. Place ACR and MCR controller in manual, when transferred to NORMAL, Eagle 21 control will match the two controller's outputs.
- ✓d. Place the MCR controller in manual and adjust the controller output to match the output of the ACR controller then transfer.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

71. 035K4.06 001

Given the following plant conditions:

- The unit is operating at 100% power
- The controlling #3 S/G pressure transmitter fails LOW.

Which ONE of the following describes the effect this will have on indicated steam flow and the initial #3 S/G FW Reg valve response?

	<u>Indicated Steam Flow</u>	<u>Valve Response</u>
a.	Drop	FCV will open
✓b.	Drop	FCV will close
c.	Rise	FCV will open
d.	Rise	FCV will close

72. 039A1.03 001

Given the following plant conditions:

- Startup in progress.
- Operators are warming the main steam lines using the MSIV bypasses.
- The OAC observes that the RCS has cooled down 108°F in the past hour.
- The CRO observes that the main steam lines have heated up 102°F in the past hour.

Which ONE of the following indicates the actions that should be taken by the operators and why?

- ✓a. Close the MSIV bypass valves; RCS cooldown limit was exceeded.
- b. Close the MSIV bypass valves; main steam line heat-up limit was exceeded.
- c. Close the MSIV bypass valves; both RCS and main steam line limits were exceeded.
- d. Leave MSIV bypass valves open; NO RCS or main steam line limits were exceeded.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

73. 039A3.02 001

Given the following plant conditions:

- Reactor coolant system pressure has decreased to 1930 psig during a plant cooldown.
- The operator has placed the Low Steam Line Pressure Block switches HS-63-135 A & B to BLOCK.

Which ONE of the following describes the status of the Safety Injection and Main Steam Line isolation signals?

- a. Only the low steamline pressure MSIV isolation is blocked; low steamline pressure SI is operational.
- b. Only the low steamline pressure SI signal is blocked; low steam line pressure MSIV isolation is operational.
- c. Both the high steamline pressure negative rate MSIV isolation and high steamline pressure negative rate SI signal are operational.
- ✓d. Both the low steam line pressure MSIV isolation and low steam line pressure SI signal are blocked.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

74. 063K2.01 001

Given the following plant conditions:

- Reactor tripped on lo-lo SG level.
- All MSIVs are closed.
- All feedwater reg and bypass reg valves are closed.
- Turbine Driven AFW pump is the ONLY AFW pump running.
- All DGs are running unloaded.

Which ONE of the following correctly lists the 125V DC Vital Battery Board(s) that is/are deenergized?

- a. Only Board I.
- b. Only Board III.
- ✓c. Board I and II.
- d. Board I and III.

75. 064K2.03 001

Given the following plant conditions:

- Unit at 100% power.
- 1A-A D/G Battery Abnormal annunciation is in alarm
- An AUO is dispatched and confirms that the power supply to the 1A-A D/G Battery Charger is deenergized.

A loss of the bus from which ONE of the following power supplies would account for this condition?

- a. 1A1-A 480V Shutdown Board
- ✓b. 1A2-A 480V Diesel Aux Board
- c. 120V Vital Instrument Power Board I-III
- d. 1A1-A 480V Reactor MOV Board

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

76. 064K6.08 001

Given the following plant conditions:

- Plant is at 100% power
- 1A-A Diesel Generator (D/G) running for a surveillance test.

Which ONE of the following identifies how fuel oil makeup occurs to the 1A-A D/G Day Tanks while the D/G is running?

- ✓a. Automatically from the 7-day tanks using the D/G mounted fuel oil transfer pumps.
- b. Manually from the 7-day tanks using the D/G mounted fuel oil transfer pumps.
- c. Automatically from the south (No. 1) Fuel Oil Storage Tank using the D/G building transfer pump.
- d. Manually from the south (No. 1) Fuel Oil Storage Tank using the D/G building transfer pump.

77. 073K1.01 001

Given the following plant conditions:

- Unit is at 100% power
- High radiation alarms are in on Steam Generator Blowdown (SGBD) radiation monitors 1-RM-90-120 and 121.

Which ONE of the following describes the SGBD System response?

- a. The SGBD Containment isolation valves, FCV-15-181 through 184, close.
- ✓b. The SGBD Cooling Tower blowdown isolation valve, FCV-15-44, closes.
- c. The SGBD to Condensate Header isolation Valve, FCV-15-6, closes.
- d. The SGBD flow control valve, FCV-15-43, closes.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

78. 075K3.07 001

Given the following conditions:

- A loss of offsite power has occurred.
- Tavg is 557°F.
- Steam Dump controls are in the Steam Pressure mode.
- Steam dump demand is manually increased to begin cooldown.
- Steam Dump valves will NOT open.

Which ONE of the following explains why the Steam Dump valves will NOT open?

- a. P-4, Reactor Trip, has not been actuated.
- ✓b. C-9, Condenser Available, interlock is not met.
- c. P-12, Lo-Lo Tavg, has disarmed the Steam Dump system.
- d. C-7, Load Rejection controller, has not been actuated.

79. 075A4.01 001

Given the following plant conditions:

- Reactor trip and safety injection occurred while the plant was operating at 100% power.
- Four ERCW pumps were running in their normal alignment before the SI occurred.

Which ONE of the following identifies ERCW pump status after the SI and the effect it has on the Condenser Circulating Water (CCW) system make-up?

- a. Four ERCW pumps running; CCW make-up is provided only from ERCW since RCW bypass strainer is isolated.
- b. Eight ERCW pumps running; CCW make-up is provided only from RCW since ERCW is routed through the overflow structure.
- ✓c. Four ERCW pumps running; CCW make-up provided from both RCW and ERCW.
- d. Eight ERCW pumps running; CCW make-up is not required since the unit is tripped.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

80. 005K4.07 001

Given the following plant conditions:

- Unit was operating at 100% power.
- A large break LOCA resulted in a reactor trip and safety injection.
- Alignment to Cold Leg Recirculation is in progress.
- 1-FCV-63-8, 1A-A RHR Pump to CCP suction, will NOT open from the Control Room.

Assuming all other equipment functions as expected, which ONE of the following would prevent the valve from opening?

- a. SI pump minimum flow valve 1-FCV-63-175 open.
- b. RHR pump suction from RWST 1-FCV-63-1 open.
- ✓c. Containment sump suction valve 1-FCV-63-72 closed.
- d. The A train safety injection signal has been reset.

81. 005A2.01 001

Given the following plant conditions:

- Plant is at 100% power.
- While making plant rounds the Auxiliary Building NAUO discovered that the 1A-A RHR Pump discharge flow indicating switch, 1-FIS-74-12, is indicating 1500 gpm flow.
- An inadvertent safety injection occurs (SI).

Which ONE of the following identifies the impact of this instrument failure on 1A-A RHR pump mini-flow valve?

	<u>PRIOR to pump start</u>	<u>AFTER Pump start</u>
a.	Open	Open
✓b.	Closed	Closed
c.	Closed	Open
d.	Open	Closed

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

82. 027K2.01 001

Given the following plant conditions

- Unit is at 100% power.
- 1A-A 6.9 KV Shutdown Board is out of service for maintenance.
- A reactor trip and safety injection (SI) is initiated due to a large break LOCA.
- Automatic and manual "B" train Safety Injection fails to actuate.

With no further operator action, which ONE of the following describes the status of the Emergency Gas Treatment System (EGTS)?

- a. Both trains are running
- b. Only "A" train is running
- c. Only "B" train is running
- ✓d. Neither train is running

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

83. 028K6.01 001

Given the following plant conditions:

- A large break LOCA occurs from 100% power.
- "B" Hydrogen recombiner is tagged out.
- "A" Hydrogen Recombiner has been placed in service.
- Subsequently the "A" Hydrogen Recombiner trips on overcurrent.

Which ONE of the following indicates how the concentration of hydrogen will be controlled inside containment if the "A" Hydrogen Recombiner trips?

- a. Containment Purge Supply and Exhaust fans are placed in service to dilute the hydrogen concentration in containment.
- b. A continuous vent path is provided that allows hydrogen to vent to the annulus and then be removed by EGTS.
- ✓c. Air Return Fans create a mixing effect and the hydrogen igniters will burn hydrogen to maintain it below an explosive concentration.
- d. Emergency Gas Treatment System will remove hydrogen which collects in the containment dome and discharge to the shield building vent.

84. 034K4.01 001

Which ONE of the following describes a feature of the Refueling Machine designed to prevent the accidental release of a fuel assembly?

- a. Gripper is mechanically engaged and disengaged by remote operating handle on bridge and requires no power or air to operate.
- ✓b. Gripper requires air to disengage, however a mechanical latch prevents gripper release under load even if air is applied.
- c. Gripper disengages upon loss of air, however a mechanical latch prevents gripper release under load even if air is removed.
- d. When gripper is engaged, operators mechanically lock gripper in place with extension shaft which must be unlocked before gripper can release.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

85. 034A1.02 001

Given the following plant conditions:

- Core load is in progress.
- A failure of the Reactor Cavity Seal occurred.
- Cavity level is currently el. 748' and dropping slowly.

Which ONE of the following actions is required per AOI-29, "Dropped or Damaged Fuel or Refueling Cavity Seal Failure"?

- a. Align RHR suction to the RWST and discharge to the RCS through the hot legs.
- ✓b. Align CCP suction to RWST and discharge to the RCS through normal charging.
- c. Start one SI pump in the cold leg injection flowpath for cavity makeup.
- d. Align Refueling Water Purification pumps suction to RWST and discharge directly to refueling cavity.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

86. 045A1.05 001

Given the following plant conditions:

- Unit 1 at 20% RTP
- Turbine trip occurs without a Reactor trip.

- The Steam Dump System is in T-avg Mode.
- Rod Control is in Automatic

Which ONE of the following describes the effect of the Turbine trip on the Steam Dump and the Rod Control Systems? Assume no operator actions.

- ✓a. The Steam Dump System will maintain T-avg at 562° F with all Control Rods fully inserted.

- b. The Steam Dump System will maintain T-avg at 557° F with all Control Rods fully inserted.

- c. The Steam Dump System will maintain T-avg at 562° F with Control Rods maintaining ≈15% Reactor power due to C-5.

- d. The Steam Dump System will maintain T-avg at 557° F with Control Rods maintaining ≈15% Reactor power due to C-5.

87. 078K1.05 001

Which ONE of the following describes the source of instrument air and the effect of a loss of instrument air on the Main Steam Isolation Valves (MSIVs)?

- ✓a. Non-essential air; MSIVs fail CLOSED.

- b. Non-essential air; MSIVs fail OPEN.

- c. Essential air; MSIVs fail CLOSED.

- d. Essential air; MSIVs fail OPEN.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

88. G2.1.7 001

Given the following plant conditions:

- Unit at 100% RTP
- A S/G #1 safety valve begins leaking and power increases to 105% RTP.
- The crew enters AOI-38 and reduces turbine load to 90% with the valve position limiter.
- This load reduction caused reactor power to decrease to 95% RTP.

Which ONE of the following would be the correct crew response per AOI-38 if the flow increased through the leaking safety valve causing the reactor power to return to 101%?

- a. Decrease turbine load at 5%/min to reduce reactor power to <100% and continue AOI-38.
- b. Use the valve position limiter to maintain power <100% and continue AOI-38.
- ✓c. Trip the reactor, close the MSIVs and bypasses, and go to E-0.
- d. Trip the reactor, initiate SI, close the MSIVs and bypasses and go to E-0.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

89. G2.1.17 001

Given the following plant conditions:

- Inadvertent Safety Injection (SI) has occurred.
- The operating crew implemented the EOPs and is currently performing ES-1.1, "SI Termination".
- The Unit Supervisor (US) directs the Operator at the Controls (OAC) to "OPEN charging isolation 1-FCV-62-90 and 1-FCV-62-91".

Which ONE of the following communication exchanges between the OAC and US would meet the minimum expectations of Watts Bar Communication Guidelines for repeat back?

- a. OAC - "Opening 1-FCV-62-90 and 1-FCV-62-91".
US - No response required.
- b. OAC - "Opening the valves".
US - No response required.
- ✓c. OAC - "Opening 1-FCV-62-90 and 1-FCV-62-91".
US - "That is correct".
- d. OAC - "Opening the valves".
US - "That is correct".

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

90. G2.1.19 001

Given the following plant conditions:

- Unit is at 100% power with automatic VCT make-up is in progress.
- A VCT level transmitter failure resulted in make-up stopping with level at 34%.

Which ONE of the following identifies additional indications and effects of this failure?

	<u>Indications</u>	<u>Effects</u>
a.	Control board meter indicates 100%	1-LCV-62-118 full diverted
b.	Control board meter indicates 0%	1-LCV-62-118 aligned to VCT
✓c.	ICS computer indicates 100%	1-LCV-62-118 full diverted
d.	ICS computer indicates 0%	1-LCV-62-118 aligned to VCT

91. G2.2.1 001

Given the following plant conditions:

- Unit is in Mode 3
- Reactor trip breakers are closed
- RCS Tavg is 559°F
- A dilution to obtain the calculated critical boron concentration in progress.

Which ONE of the following is allowed per GO-2, "Reactor Startup"?

- a. Testing of one SRM.
- b. Stopping of an operating RCP.
- c. Withdrawal of the Shutdown Rods.
- ✓d. Energization of the PZR backup heaters.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

92. G2.2.13 001

Given the following plant conditions:

- Unit is operating at 100% power
- 1-FCV-62-93, Charging Flow Control Valve, is being tagged as a boundary isolation valve for a clearance on the CVCS charging header.

Which ONE of the following is an acceptable for tagging the valve?

- a. Tag the air isolation valve in the open position and tag the handswitch in the closed position for 1-FCV-62-93.
- ✓b. Close the valve, install a jacking device, isolate the air supply for 1-FCV-62-93, and tag the jacking device.
- c. Dog 1-FCV-62-93 closed with its handwheel, tag the valve handwheel, and tag the air isolation valve.
- d. Isolate and de-pressurize the air supply for 1-FCV-62-93 and tag the air isolation valve.

93. G2.2.26 001

Given the following plant conditions:

- Unit is in Mode 6.
- Refueling operations are in progress.
- The 30th fuel assembly is being loaded into the core.

According to FHI-7, "Fuel Handling and Movement", which ONE of the following would require fuel loading operations to be stopped immediately?

- a. An unanticipated increase in count rate by a factor of two occurs on any responding nuclear channel during any single loading step.
- ✓b. Communications is lost between Containment and the Control Room.
- c. Water in the Spent Fuel Pit is not clear enough to view the Fuel top Nozzles without supplemental lighting.
- d. Boron concentration decreases by more than 10 ppm as determined by two successive samples of Reactor Coolant.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

94. G2.2.28 001

Given the following plant conditions:

- Unit is in Mode 6.
- Refueling operations are in progress.
- An irradiated fuel assembly cannot be placed in its specified core location.

Which ONE of the following describes an approved location for the fuel assembly per FHI-7, Fuel Handling and Movement?

- a. Fuel assembly can be placed in the New Fuel Elevator, but the elevator must be full down with power removed.
- b. Fuel assembly may be placed in a free-standing core location as long as no other fuel assembly is free-standing.
- c. Fuel assembly must be returned to the SFP until an alternate core location is determined.
- ✓d. Fuel assembly may be temporarily stored in the RCCA change fixture.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

95. G2.3.1 001

The following conditions are encountered after a survey of a pump room in the Auxiliary building:

- | | |
|--|---|
| - General area radiation level in the room | 70 mrem/hr |
| - Radiation level 30 cm from the pump casing | 350 mrem/hr |
| - Contamination levels | 800 dpm/100cm ² beta
0 dpm/100cm ² alpha |

Which ONE of the following identifies the correct radiological postings required to reflect current radiological conditions for this room?

- a. Radiation Area.
- ✓b. High Radiation Area.
- c. Radiation Area; Contamination Area.
- d. High Radiation Area; Contamination Area.

96. G2.3.11 001

Which ONE of the following identifies the first radiation monitor that should respond to a SGTR and the effect on the monitor?

- a. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will be automatically isolated.
- ✓b. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will NOT be automatically isolated.
- c. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will be automatically isolated.
- d. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will NOT be automatically isolated.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

97. G2.4.1 001

Given the following conditions:

- Unit 1 in MODE 1 at 10% RTP.
- Turbine at 1800 rpm at no load (generator PCB open).
- Loss of offsite power occurs.
- Emergency Diesels fails to re-energize Shutdown Boards.

Which ONE of the following describes the correct usage of the Emergency Instructions?

- ✓a. Go directly to ECA-0.0 without entering E-0.
- b. Implement ECA-0.0 in conjunction with E-0.
- c. Go to ECA-0.0 from E-0 after verifying reactor and turbine trip.
- d. Complete E-0 IMMEDIATE ACTIONS then go immediately to ECA-0.0.

98. G2.4.19 001

A step in ES-1.3, "Transfer to RHR Containment Sump", reads as follows:

ISOLATE SI pump miniflow:

- CLOSE FCV-63-3.
- CLOSE FCV-63-175.
- CLOSE FCV-63-4.

The bullets ("•") indicate that:

- a. The actions must be performed in the specified sequence, but once a step is in progress, the next step may be started.
- b. The actions must be performed and completed in the specified sequence.
- c. These actions should have been completed, so only verification may be required.
- ✓d. These actions must all be completed, but any sequence of completion is allowed.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

99. G2.4.34 001

Given the following plant conditions:

- Control room was abandoned due to a fire.
- All controls have been transferred in accordance with AOI-30.2, Fire Safe Shutdown.
- The plant is being maintained in Hot Standby

RCS temperature is being controlled using _____ (1) _____ and RCS pressure is controlled using _____ (2) _____ ?

- a. (1) Condenser steam dumps; (2) PZR back-up heater group C.
- b. (1) Condenser steam dumps; (2) PZR back-up heater groups A-A and B-B.
- c. (1) Atmospheric steam dumps; (2) PZR back-up heater group C.
- ✓d. (1) Atmospheric steam dumps; (2) PZR back-up heater groups A-A and B-B.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

100. G2.4.48 001

Following Safety Injection reset during ES-1.1 the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PZR heater status the OAC would observe?

- a. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- b. Control group 1D ON.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- ✓c. Control group 1D OFF.
Backup group 1C ON.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- d. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A ON.
Backup group 1B-B ON.

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

Applicant Information

Name:	Region: I / <u>II</u> / III / IV
Date: 01/26/2001	Facility/Unit: Watts Bar Unit 1
License Level: <u>RO</u> SRO	Reactor Type: <u>W</u> / 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. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

Applicant's Signature

Results

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

WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION

NAME _____

SSN _____

- 1. (a) (b) (c) (d)
- 2. (a) (b) (c) (d)
- 3. (a) (b) (c) (d)
- 4. (a) (b) (c) (d)
- 5. (a) (b) (c) (d)
- 6. (a) (b) (c) (d)
- 7. (a) (b) (c) (d)
- 8. (a) (b) (c) (d)
- 9. (a) (b) (c) (d)
- 10. (a) (b) (c) (d)
- 11. (a) (b) (c) (d)
- 12. (a) (b) (c) (d)
- 13. (a) (b) (c) (d)
- 14. (a) (b) (c) (d)
- 15. (a) (b) (c) (d)
- 16. (a) (b) (c) (d)
- 17. (a) (b) (c) (d)

- 18. (a) (b) (c) (d)
- 19. (a) (b) (c) (d)
- 20. (a) (b) (c) (d)
- 21. (a) (b) (c) (d)
- 22. (a) (b) (c) (d)
- 23. (a) (b) (c) (d)
- 24. (a) (b) (c) (d)
- 25. (a) (b) (c) (d)
- 26. (a) (b) (c) (d)
- 27. (a) (b) (c) (d)
- 28. (a) (b) (c) (d)
- 29. (a) (b) (c) (d)
- 30. (a) (b) (c) (d)
- 31. (a) (b) (c) (d)
- 32. (a) (b) (c) (d)
- 33. (a) (b) (c) (d)
- 34. (a) (b) (c) (d)

- 35. (a) (b) (c) (d)
- 36. (a) (b) (c) (d)
- 37. (a) (b) (c) (d)
- 38. (a) (b) (c) (d)
- 39. (a) (b) (c) (d)
- 40. (a) (b) (c) (d)
- 41. (a) (b) (c) (d)
- 42. (a) (b) (c) (d)
- 43. (a) (b) (c) (d)
- 44. (a) (b) (c) (d)
- 45. (a) (b) (c) (d)
- 46. (a) (b) (c) (d)
- 47. (a) (b) (c) (d)
- 48. (a) (b) (c) (d)
- 49. (a) (b) (c) (d)
- 50. (a) (b) (c) (d)
- 51. (a) (b) (c) (d)

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

NAME _____

SSN _____

52. (a) (b) (c) (d)

53. (a) (b) (c) (d)

54. (a) (b) (c) (d)

55. (a) (b) (c) (d)

56. (a) (b) (c) (d)

57. (a) (b) (c) (d)

58. (a) (b) (c) (d)

59. (a) (b) (c) (d)

60. (a) (b) (c) (d)

61. (a) (b) (c) (d)

62. (a) (b) (c) (d)

63. (a) (b) (c) (d)

64. (a) (b) (c) (d)

65. (a) (b) (c) (d)

66. (a) (b) (c) (d)

67. (a) (b) (c) (d)

68. (a) (b) (c) (d)

69. (a) (b) (c) (d)

70. (a) (b) (c) (d)

71. (a) (b) (c) (d)

72. (a) (b) (c) (d)

73. (a) (b) (c) (d)

74. (a) (b) (c) (d)

75. (a) (b) (c) (d)

76. (a) (b) (c) (d)

77. (a) (b) (c) (d)

78. (a) (b) (c) (d)

79. (a) (b) (c) (d)

80. (a) (b) (c) (d)

81. (a) (b) (c) (d)

82. (a) (b) (c) (d)

83. (a) (b) (c) (d)

84. (a) (b) (c) (d)

85. (a) (b) (c) (d)

86. (a) (b) (c) (d)

87. (a) (b) (c) (d)

88. (a) (b) (c) (d)

89. (a) (b) (c) (d)

90. (a) (b) (c) (d)

91. (a) (b) (c) (d)

92. (a) (b) (c) (d)

93. (a) (b) (c) (d)

94. (a) (b) (c) (d)

95. (a) (b) (c) (d)

96. (a) (b) (c) (d)

97. (a) (b) (c) (d)

98. (a) (b) (c) (d)

99. (a) (b) (c) (d)

100. (a) (b) (c) (d)

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

1. Given the following plant conditions:

- Reactor is at 75% with a power increase in progress using control rods.
- The OAC determines that Control Bank D rod H-12 is not moving and is 14 steps below the other rods in D bank.
- Crew is performing AOI-2, "Malfunction of Reactor Control System" to realign control rod H-12 with the bank.

Which ONE of the following describes how control rod H-12 will be realigned to control bank D and how control bank insertion limit will change following the realignment?

- a. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be higher.
- b. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be lower
- c. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be lower.
- d. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be higher.

2. Given the following plant conditions:

- Reactor power is stable at 30%
- Loop 1 RCP trips

Assuming reactor power remains constant, core exit temperature will:

- a. increase, then stabilize at a higher value.
- b. decrease, then stabilize at a lower value.
- c. increase, then return to the original steady-state value.
- d. decrease, then return to the original steady-state value.

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3. Given the following conditions:

- Unit at 60% power.
- Confirmed Loop 1 RCP shaft vibration of 25 mils.

Which ONE of the following statements is correct per AOI-5, "Unscheduled Removal of One RCP", regarding the sequence of actions?

- a. RCP should be tripped prior to the reactor trip to minimize pump damage.
- b. The reactor should be tripped prior to tripping the RCP to prevent pressurizer level from dropping below 17%.
- c. RCP should be tripped prior to the reactor trip to prevent Reactor Coolant Bus voltage from dropping and tripping additional RCPs.
- d. The reactor should be tripped prior to tripping the RCP to prevent an automatic trip and an unnecessary challenge to a safety system.

4. Given the following plant conditions:

- Unit was operating at 58% power.
- Problems with #4 RCP required the pump to be shut down in accordance with AOI-5, "Unscheduled Removal of One RCP".

AOI-5 requires the plant to be in which ONE of the following conditions for restart of #4 RCP?

- a. < P-10.
- b. < P-9.
- c. < P-8.
- d. Mode 3.

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5. Given the following plant conditions:

- Plant was operating at 100% power when a Main Feedwater pump trip resulted in a turbine runback.
- All systems in automatic and responded as expected to stabilize the plant.
- Control rods inserted beyond the Lo-Lo Rod Insertion limits.
- Operators implemented AOI-34, "Immediate Boration", in accordance with the ARI.

Which ONE of the following indicates the final, stable plant conditions AFTER completion of the boration as compared to those PRIOR to the boration?

	<u>Reactor Power</u>	<u>Rod Position</u>	<u>Tavg</u>
a.	Same	Higher	Higher
b.	Same	Higher	Same
c.	Lower	Lower	Same
d.	Lower	Lower	Lower

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6. Given the following plant conditions:

- The Unit is at 100% load.
- Pressurizer pressure channel selector switch, 1-XS-68-340D, is in the PT-68-340 & 334 position.
- Instrument Maintenance has 1-PT-68-323 (CH III) OOS for a loop calibration.
- PZR Pressure transmitter, 1-PT-68-334 (CH II) has just failed AS IS.
- The operating crew implements AOI-18, "Malfunction of Pressurizer Pressure Control System".

Which ONE of the following channels will be selected on 1-XS-68-340D and position of the master controller following completion of AOI-18, Malfunction of Pressurizer Pressure Control System?

- a. Channel I and III selected with 1-PIC-68-340A in AUTO.
- b. Channel I and III selected with 1-PIC-68-340A in MANUAL.
- c. Channel I and IV selected with 1-PIC-68-340A in AUTO.
- d. Channel I and IV selected with 1-PIC-68-340A in MANUAL.

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7. Given the following plant conditions:

- Plant is operating at 100% power.
- One pressurizer safety valve failed full OPEN.
- Operating crew initiated reactor trip/safety injection and entered the EOPs.
- Safety Injection signal is not reset.

Which ONE of the following is the status of Pressurizer level and pressure control 10 minutes following the reactor trip/safety injection?

- a. PZR level indication offscale LOW.
PZR heaters ON.
- b. PZR level indication offscale LOW.
PZR heaters OFF.
- c. PZR level indication offscale HIGH.
PZR heaters ON.
- d. PZR level indication offscale HIGH.
PZR heaters OFF.

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8. Given the following plant conditions:

- Plant is operating at 100% power.
- A loss of 120V AC Vital Instrument Power Board 1-I occurred.
- The crew implements AOI-25.01, "Loss of 120V AC Vital Instrument Power Board 1-I".

Which ONE of the following identifies the train selector switches that must be selected for automatic control of feedwater and which loop 1 feedwater/steam flow indications are available?

	<u>Feedwater/Steam Flow Selector Switches</u>	<u>Feedwater/Steam Flow Indications</u>
a.	A train	Channel I
b.	A train	Channel II
c.	B train	Channel I
d.	B train	Channel II

9. Given the following:

- Committed Dose Equivalent (CDE) is 1875 mrem
- Deep Dose Equivalent (DDE) is 1620 mrem
- Lens Dose Equivalent (LDE) is 430 mrem
- Committed Effective Dose Equivalent (CEDE) is 260 mrem
- Total Organ Dose Equivalent (TODE) is 3685 mrem
- Shallow Dose Equivalent (SDE) is 295 mrem

What is the Total Effective Dose Equivalent (TEDE)?

- a. 3980 mrem
- b. 2170 mrem
- c. 1915 mrem
- d. 1880 mrem

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10. Which ONE of the following conditions concerning the Personnel Airlock would exceed a Limiting Condition for Operation and require entering an Action Statement of Technical Specifications?
- a. The lower containment airlock fails its LLRT while control rod unlatching is in progress.
 - b. Welding cables are laid through both lower containment airlock doors during RCS fill and vent at the end of an outage.
 - c. The lower containment airlock door interlocks are defeated while reactor vessel head is being tensioned.
 - d. The outer and inner doors are opened simultaneously during a normal cooldown prior to aligning RHR to the RCS.

11. Given the following plant conditions:

- Inadequate core cooling conditions exist
- Crew is performing FR-C.1, Inadequate Core Cooling

Which ONE of the following sets of actions states the proper sequence of the major action categories to be performed for removing decay heat from the core?

- a. Rapid secondary depressurization; reinitiation of high head safety injection; RCP restart
- b. Reinitiation of high head safety injection; rapid secondary depressurization; RCP restart
- c. Rapid secondary depressurization; RCP restart; reinitiation of high head safety injection
- d. RCP restart; rapid secondary depressurization; reinitiation of high head safety injection

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12. Which ONE of the following correctly describes the indication on the main steam line radiation monitors when the MR/HR AUTO pushbutton is lit on the RM-23 readout module?
- a. Indicates low range output only.
 - b. Indicates high range output only.
 - c. Automatically switches between the low and high range outputs every 45 seconds.
 - d. Automatically switches between low and high range output based upon activity level in order to maintain accurate indication.
13. Given the following plant conditions:
- Operators are responding to a large break LOCA and have determined that degraded core cooling conditions exist.
 - The crew has implemented FR-C.2, "Degraded Core Cooling".
 - Preparations are in progress to depressurize all intact S/Gs to atmospheric pressure in accordance with FR-C.2.

Which ONE of the following is the reason the procedure directs all RCPs be stopped prior to performing the depressurization?

- a. Reduces the core ΔP which will enhance the ability of the RHR pumps to inject into the core.
- b. Minimizes heat input to the S/Gs allowing them to depressurize faster.
- c. Limits heat removal requirements to the core decay heat only.
- d. Anticipates a loss of RCP #1 seal ΔP requirements.

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14. Given the following plant conditions:

- A large break LOCA has occurred that resulted in saturated core cooling conditions.
- RWST level is 28%
- Crew is performing step 4 of FR-C.3, Saturated Core Cooling to establish SI pump valve alignment.

Which ONE of the following identifies valves that should be verified CLOSED during performance of this step?

- a. FCV-63-6, 7 and 177, SI pump and Charging pump suction from RHR.
- b. FCV-63-47 and 48, SI pump suction valves
- c. FCV-63-152 and 153, SI pump cold leg injection cross-tie valves
- d. FCV-63-3, 4 and 175 SI pump mini-flow valves

15. Given the following plant conditions:

- Reactor trip occurred with subsequent loss of RCPs.
- Operators have implemented ES-0.2, "Natural Circulation Cooldown".
- A cooldown rate of 25°F/hour has been established.
- RCS depressurization has been initiated while maintaining subcooling > 165°F.
- Operators are monitoring PZR level and RVLIS for void formation.
- The OAC observes that loss of inventory in the Condensate Storage Tank is imminent.

Which ONE of the following describes the appropriate procedural actions?

- a. Stop the cooldown and remain in ES-0.2.
- b. Raise the cooldown rate and remain in ES-0.2.
- c. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and lower the cooldown rate.
- d. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and raise the cooldown rate.

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16. Which ONE of the following describes the reason for tripping all RCPs during the performance of FR-Z.1, "High Containment Pressure"?
- a. Removes heat transferred to the Containment atmosphere from the RCP motors.
 - b. Prevents depletion of primary inventory out of the break during a small LOCA.
 - c. Containment Isolation Phase B isolates cooling water to the RCPs and thermal barriers.
 - d. Removes additional energy to the RCS during a break and subsequent release to containment.

17. Given the following plant conditions:

- Unit is stable at 55% power.
- Recovery of dropped rod D-4 (Control Bank D, Group 1) is in progress.
- D-4 is at 50 steps.
- Remaining Bank D rods are at 125 steps.

Which ONE of the following Control Bank D indications will update as withdrawal of the dropped rod continues?

- a. Both Bank D step counters and P/A converter
- b. Both Bank D step counters and Bank Overlap counter
- c. Only Group 1 step counter and P/A converter
- d. Only Group 1 step counter and Bank Overlap counter

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18. Given the following plant conditions:

- Unit 1 operating at 22% power.
- Reactor Trip Breakers "A" & "B" closed.
- Bypass Breaker B is racked in and closed.
- "B" Train SSPS Input Error Inhibit Switch is in INHIBIT for surveillance testing.

Which ONE of the following describes the response of the Reactor Trip and Bypass Breakers if RCS pressure drops below the Low Pressure Reactor trip setpoint with no operator action?

- a. Reactor Trip Breakers "A" & "B" open, Bypass Breaker "B" opens.
- b. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" remains closed.
- c. Reactor Trip Breaker "B" opens and "A" remains closed, Bypass Breaker "B" opens.
- d. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" opens.

19. Given the following plant conditions:

- Unit was at 100% power.
- All systems operating in automatic and all plant parameters at their normal values.
- 1-PCV-68-340 failed partially open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 45 psig?

- a. 228°F.
- b. 250°F.
- c. 275°F.
- d. 290°F.

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20. According to the safety limit technical specification basis for RCS pressure, the maximum transient pressure allowed is:
- a. 110% of design pressure.
 - b. 110% of normal operating pressure.
 - c. 125% of design pressure.
 - d. 125% of normal operating pressure.

21. Given the following conditions:

- A large break LOCA occurred
- Operators have just completed swapper to Containment Sump
- A loss of offsite power occurs

Which ONE of the following describes the actions required for this condition?

- a. Pull to lock SI pumps and CCPs until the RHR pumps have been restarted after the shutdown boards are reenergized.
- b. Pull to lock the CCPs until the RHR pumps are restarted after the shutdown boards are reenergized.
- c. Ensure both RHR pumps are started by the blackout sequencer after the diesel generators reenergize the shutdown boards then restart the SI pumps.
- d. Ensure all ECCS pumps are started by the blackout sequencer when the diesel generators reenergize the shutdown boards.

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22. Given the following plant conditions:

- ATWS without Safety Injection has occurred.
- Crew has implemented FR-S.1, "Nuclear Power Generation/ATWS", and currently performing step 4 to borate the RCS.

Which ONE of the following identifies the correct Operator action that must be taken in order to align charging pump suction?

- a. CLOSE LCV-62-132 and 133, VCT outlet isolation, then OPEN LCV-62-135 and 136, RWST supply to charging pump suction.
- b. OPEN LCV-62-135 and 136, RWST supply to charging pump suction, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- c. Verify LCV-62-135 and 136, RWST supply to charging pump suction AUTO OPEN, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- d. Verify LCV-62-135 and 136, RWST supply to charging pump suction and LCV-62-132 and 133, VCT outlet isolation AUTO OPEN.

23. Given the following plant conditions:

- The Unit is in MODE 6.
- Source Range Monitor (SRM) NI-132 has failed LOW resulting in a loss of the audio count rate signal.

WHICH ONE of the following describes the actions necessary to restore the audio count rate signal to the control room.

- a. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N31 position.
- b. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N32 position.
- c. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A1 position.
- d. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A2 position.

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24. Given the following plant conditions:

- A Reactor startup in progress.
- Reactor power is stable at $2 \times 10^{-2}\%$ power on the Intermediate Range
- Intermediate Range channel N-135 was declared inoperable and removed from service per AOI-4, "Nuclear instrumentation Malfunction".

Which ONE of the following describes the plant response if an I&C Technician mistakenly removes the control power fuses for N-135 during troubleshooting activities?

- a. The trip bistable deenergizes and a reactor trip occurs because power is below P-10.
- b. The trip bistable deenergizes, however NO trip occurs because N-135 is bypassed.
- c. The trip bistable energizes, however NO trip occurs because N-135 is bypassed.
- d. The trip bistable energizes and a reactor trip occurs because power is below P-10.

25. Given the following plant conditions:

- Steam Generator Tube Rupture has occurred.
- Crew has implemented E-3, "Steam Generator Tube Rupture".
- The operators have completed cooldown to target incore temperature of 480°F.

Which ONE of the following identifies the pressure that steam dumps will be set to control RCS temperature at 480°F?

- a. 580 - 585 psig.
- b. 550 - 555 psig.
- c. 580 - 585 psia.
- d. 550 - 555 psia.

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26. Given the following plant conditions:

- AUO reports Emergency Diesel Generator (D/G) 1A-A has lost 125V DC control power from it's associated Diesel Battery Distribution Panel
- D/G 1A-A is NOT running.

Which ONE of the following describes how this loss of DC control power would affect D/G operation?

- a. D/G would start in response to an automatic or manual start signal.
- b. D/G cannot be started by automatic or manual start signal.
- c. D/G can only be started manually from local control panel.
- d. D/G can only be started manually from the MCR panel.

27. Given the following plant conditions:

- Plant is operating a 100% power.
- Plant systems aligned and operating normally.
- Annunciator, CCS HX A 1-RM-90-123 LIQ RAD HIGH, is in alarm.

Which ONE of the following lists the type and source of radiation sensed by the radiation monitor that is in alarm?

- a. Gamma; Thermal Barrier leakage.
- b. Beta; Thermal Barrier leakage.
- c. Gamma; RCP motor cooler leakage.
- d. Beta; RCP motor cooler leakage.

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28. Given the following plant conditions:

- A Gas Decay Tank release in progress with ABGTS running for dilution air flow.
- A leak occurs on the waste gas compressor which results in a gas release to the Auxiliary Building.
- 0-RE-90-101, Auxiliary Building Vent Monitor, is in alarm.

Which ONE of the following indicates the effect this leak will have on the plant?

- a. Gas Decay Tank release will be terminated; ABGTS will be stopped.
 - b. Gas Decay Tank release will be terminated; ABGTS will continue to run.
 - c. Gas Decay Tank release will continue; ABGTS will be stopped.
 - d. Gas Decay Tank release will continue; ABGTS will continue to run.
29. Once an operating crew has entered the EOP network, which ONE of the following is the earliest that a transition may be made to ES-0.0, "Rediagnosis"?
- a. AFTER transition from E-0 and safety injection initiated.
 - b. AFTER transition from E-0 and NO safety injection initiated.
 - c. BEFORE transition from E-0 and safety injection initiated.
 - d. BEFORE transition from E-0 and NO safety injection initiated.

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30. Given the following plant conditions:

- A small break LOCA has occurred
- 1B-B CCP and SIP failed to start and could not be started manually.
- E-1 is completed and transition to ES-1.2, "Post LOCA Cooldown and Depressurization", made.
- 6.9kV Shutdown Board 1A-A is de-energized due to a fault
- The following conditions are noted by the OAC
 - RCS pressure is 1600 psig
 - Containment pressure is 6 psig

Which ONE of the following describes the action that should be taken and the basis for that action?

- a. All RCPs should be stopped to limit heat input during the RCS cooldown.
 - b. All RCPs should be stopped because Phase B isolation has occurred.
 - c. All RCPs should NOT be stopped because no CCP or SIP is injecting into the RCS.
 - d. All RCPs should NOT be stopped because the RCS pressure is above 1500 psig.
31. Which ONE of the following is the significance of draining the SG U-tubes and blowing the inverted "loop seal" during a cold leg small break LOCA?
- a. A steam vent path is established from the core to the break location and mass loss from the system is decreased.
 - b. Core cooling will be lost after the loop seal is blown due to increased injection flow being diverted to the break location.
 - c. RCS pressure control will be lost resulting in a challenge to Pressurized Thermal Shock limits.
 - d. The heat sink effect of the water in the "crossover" leg is lost when the loop seal is lost resulting in a degraded core cooling.

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32. Given the following plant conditions:

- Reactor trip and safety injection occurred.
- The crew implemented FR-H.1, "Loss of Secondary Heat Sink" due to heat sink red path.
- Operators are preparing for main feedwater startup.

Which ONE of the following lists the minimum actions required to reset Main Feedwater Pump 1A?

- a. Reset safety injection and cycle reactor trip breakers.
- b. Reset safety injection and reset feedwater isolation signal.
- c. Cycle the reactor trip breakers and reset feedwater isolation signal.
- d. Reset safety injection, cycle reactor trip breakers, and reset feedwater isolation signal.

33. Given the following plant conditions:

- Reactor trip and SI occurred at 0200 due to a small LOCA.
- At 0300 the crew transitioned to ECA-1.1, "Loss of RHR Sump Recirculation", due to the failure of both RHR pumps.
- Crew has reduced ECCS flow to 1 SIP and 1 CCP per ECA-1.1.
- At 0500 the crew is performing step 17 RNO to establish the minimum required ECCS flow to remove decay heat.

Using Figure 1 from ECA-1.1, which ONE of the following flow rates would satisfy the intent of the RNO?

- a. 180 gpm
- b. 210 gpm
- c. 240 gpm
- d. 280 gpm

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34. Which ONE of the following describes why the baseline count rate used for developing the 1/M plot must be re-calculated following movement of any source bearing fuel assembly ?
- a. Re-verify the operability of the source range instruments.
 - b. Ensures an accurate 1/M plot to monitor subcriticality.
 - c. Determine adequate shutdown margin during refueling.
 - d. Readjust the setpoint for the High Flux at Shutdown alarm.

35. Given the following plant conditions:

- A Loss of offsite power has occurred.
- A Natural circulation cooldown is in progress.

Which ONE of the following describes how the loss of 2 CRDM fans will affect the cooldown?

- a. No effect, because the amount of RCS heat removal by running the fans is insignificant compared to that removed by steaming the secondary plant.
- b. Less subcooling is required, and the T-cold cooldown rate will be more.
- c. More subcooling is required, and the T-cold cooldown rate will be less.
- d. The upper head will void, since there is not enough cooling available with only two CRDM fans to keep it subcooled.

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36. Following an automatic start due to low instrument air pressure, which ONE of the following describes what will cause Aux Air Compressors to shutdown?
- a. Running unloaded for 5 mins.
 - b. Running unloaded for 10 mins.
 - c. Low crankcase oil pressure.
 - d. High discharge air temperature.

37. Given the following plant conditions:

- The Unit is at 1% power after an extended shutdown.
- Core burnup is 2000 MWD/MTU.
- RCS boron concentration is 1000 ppm.
- Control rods at 175 steps
- The STA has determined that 236 pcm of reactivity must be added to increase power to 10%.

Using the attached NUPOP curve and assuming no control rod movement, which ONE of the following identifies the final boron concentration of the RCS after the reactivity change has been made?

- a. 966 ppm
- b. 969 ppm
- c. 1031 ppm
- d. 1034 ppm

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38. Unit is operating at 100% power with all systems in their normal configuration, when Auctioneered High Tavg fails LOW.

Which ONE of the following describes the plant response?

- a. Control rods will step in; Charging Flow Control valve, 1-FCV-62-93, opens.
- b. Control rods will step out; Charging Flow Control valve, 1-FCV-62-93, closes.
- c. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, opens.
- d. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, closes.

39. Given the following plant conditions:

- The Unit is operating at 100% power.
- All systems are operating normal.
- Annunciator "RCP #1 Seal Outlet Temp Hi" alarm actuates.
- The operator verifies that ALL RCP seal temperatures are 180°F rising.

Which ONE of the following is the most probable cause of this alarm?

- a. The Charging Pump suction has swapped to the RWST.
- b. The operator has just placed Excess Letdown in service at maximum flow rate.
- c. The Letdown Heat Exchanger temperature control valve 1-TCV-70-192 has failed closed.
- d. A loss of control air to charging flow control valve 1-FCV-62-93.

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40. Which ONE of the following describes why the RCPs are tripped if the low pressure trip criteria is reached during a small-break LOCA?
- a. Eliminate heat input from the RCPs into the RCS.
 - b. Limit hydrogen buildup which could preclude core cooling.
 - c. Steam may be present in the RCS which will cause RCP impeller damage from cavitation.
 - d. Excessive depletion of RCS water inventory might lead to core uncover if RCPs are tripped later in the accident.

41. Given the following conditions:

- Reactor power 35%.
- Turbine load 32%
- Control Rods are in AUTOMATIC.
- CVCS Mixed Bed A was placed in service resulting in a T-avg increase to 571°F.

Which ONE of the following describes the response of the rod control system?
(assume no operator action)

- a. Rods will step in at 8 steps per minute.
- b. Rods will step in at 40 steps per minute.
- c. Rods will step in at 64 steps per minute.
- d. Rods will step in at 72 steps per minute.

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42. Given the following plant conditions:

- The unit is at 100% power with 1A-A CCP is in operation.
- A loss of offsite power occurs
- All appropriate loads sequence onto the Shutdown Boards
- The crew has implemented E-0, "Reactor Trip or Safety Injection"
- While the immediate actions are being completed, a safety injection signal (SI) is received.

Which ONE of the following describes the response of the Centrifugal Charging Pumps (CCPs)?

- a. 1A-A CCP load sheds on the SI signal, and both CCPs auto sequence on the shutdown boards.
- b. 1A-A CCP load sheds on the SI signal, and must be restarted manually by the operator.
- c. 1A-A CCP does not load shed on the SI signal, and 1B-B CCP auto sequences on the shutdown boards.
- d. Both CCPs remain energized and running following the SI signal.

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43. Given the following:

- 1A-A and 1B-B SI Pump breakers are "Racked In".
- A fuse blows in the NORMAL DC Trip circuit for the 1A-A SI pump.
- A safety injection (SI) actuation occurs.

Which ONE of the following describes the response of the SI Pumps to the SI signal?

- a. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start until the control power supply is transferred.
 - b. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start and must be started from the MCR handswitch.
 - c. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped from the MCR.
 - d. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped mechanically at the breaker.
44. Which ONE of the following describes the logic for Safety Injection (SI) actuation handswitches and reset pushbuttons?
- a. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets both trains of SI.
 - b. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets only it's associated train of SI.
 - c. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets only it's associated train of SI.
 - d. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets both trains of SI.

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45. Given the following plant conditions:

- Unit is operating at 75% power
- A plant transient has resulted in a xenon oscillation
- Control rods are currently at 216 steps on D bank

Which ONE of the following is the effect of the xenon oscillation on NIS and the action required to dampen the oscillation?

- a. The oscillation affects AFD and is dampened by inserting control rods at its most positive peak.
- b. The oscillation affects AFD and is dampened by inserting control rods at its most negative peak.
- c. The oscillation affects QPTR and is dampened by dropping turbine load at its highest value.
- d. The oscillation affects QPTR and is dampened by dropping turbine load at its lowest value.

46. Given the following plant conditions:

- Plant is at 25% power with shutdown in progress.
- Power range upper detector, N43A, fails HIGH.

Which ONE of the following identifies the method used to block the "At Power" reactor trips when turbine load is reduced to < 10%?

- a. Manually blocked when 3/4 operable power range channels < 10% power.
- b. Auto blocked when 3/4 power range channels < 10% power.
- c. Manually blocked when 2/4 power range channels < 10% power.
- d. Auto blocked when 2/4 power range channels < 10% power.

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47. Given the following plant conditions:

- A small break LOCA has occurred.
- The crew responded IAW EOPs and tripped the RCPs when required.
- The crew is currently in ES-1.2, "Post LOCA Cooldown And Depressurization".
- RCS pressure is 1490 psig.
- Wide range Tc's are 505°F and decreasing slowly.
- Wide range Th's are 515°F and decreasing slowly.
- Core exit thermocouples (CETC) are 551°F and stable.
- Containment pressure is 1.5 psig.
- SG levels are being maintained at 38%.
- SG pressures are 715 psig and decreasing slowly.

Which ONE of the following describes the status of natural circulation for the existing plant conditions?

- a. Cannot be assured, since there is inadequate sub-cooling.
 - b. Cannot be assured, since SG parameters are not satisfied.
 - c. Cannot be assured, since CETCs are not decreasing.
 - d. Exists since all natural circulation criteria are met.
48. Which ONE of the following lists functions/components that receive input from the Core Exit Thermocouples?
- a. ICCM plasma display, ICS, RVLIS recorder.
 - b. ICS, Rod Insertion Limit computer, RVLIS recorder.
 - c. ICCM plasma display, OTΔT calculator, RVLIS recorder.
 - d. Core quadrant average temperature, ICS, OPΔT calculator.

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49. Given the following plant conditions:

- Reactor trip & Safety Injection occurred due to Large Break LOCA.
- Containment ØB isolation has occurred.
- All systems responded normally.

Which ONE of the following describes the response of the Lower Compartment Coolers when ØB is reset?

- a. Fans in A-P-AUTO start .
Cooler ERCW isolation valves open.
- b. Fans in A-P-AUTO start.
Cooler ERCW isolation valves remain closed.
- c. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves open.
- d. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves remain closed.

50. Given the following plant conditions:

- Main Steam Line Break occurred inside containment causing a reactor trip and safety injection.
- Operators have implemented the EOPs.
- Containment pressure is 3.2 psig and dropping.
- OAC observes the "INSTR ROOM COOLER A/B FLOW LOW" alarm LIT.

Which ONE of the following ESFAS signals caused the Incore Instrument Room Cooling fans, circ pump, and chiller to shut down?

- a. Containment vent isolation (CVI).
- b. ØA containment isolation.
- c. ØB containment isolation.
- d. Aux. Building Isolation (ABI)

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51. Given the following plant conditions:

- Large break LOCA has occurred causing a reactor trip and safety injection.
- OAC observes annunciator "Glycol Exp Tank Level Hi/Hi-Hi is LIT.

Which ONE of the following describes the most likely reason the annunciator is LIT?

- a. ØA closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- b. ØA closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.
- c. ØB closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- d. ØB closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.

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52. Given the following plant conditions:

- Plant startup in progress.
- Tavg is being maintained at 557°F by Steam dumps.
- Operators are preparing to take the reactor critical.
- Standby Main Feedwater Pump in service supplying the SGs.

Which ONE of the following is the reason why a Condensate Booster Pump should NOT be operated at this time?

- a. To prevent overfeeding steam generators.
- b. To prevent lifting the high pressure feedwater heater relief valves.
- c. To prevent overpressurization and damage to the SG's feedwater preheat section.
- d. To prevent overpressurization and damage to the Standby Main Feedwater Pump suction piping.

53. Given the following conditions:

- Unit is operating at 100% power.
- FCV-2-35, Condensate Short Cycle valve fails OPEN

Which ONE of the following describes the effect on reactor power and the correct operator response?

Reactor power will:

- a. Increase; Borate the RCS.
- b. Increase; Reduce turbine load.
- c. Decrease; Dilute the RCS.
- d. Decrease; Raise turbine load.

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54. Given the following plant conditions:

- The plant was operating at 85% RTP when a loss of offsite power occurred.
- The Emergency Diesel Generators started and re-energized the Shutdown Boards.
- The operators have implemented the EOPs.
- #4 SG PORV developed a large packing leak after opening following the reactor trip.
- The CRO has determined that the bypass feedwater isolation valves are CLOSED.

Which ONE of the following signals caused the bypass feedwater isolation valves to CLOSE?

- a. North valve vault level increasing to 4 inches due to the PORV packing leak.
- b. Lo-Lo S/G level as #4 S/G blows dry following MSIV isolation.
- c. Tavg decreasing to 564° F following the reactor trip.
- d. AFW start signal following the blackout.

55. Which ONE of the following describes the decay heat sources and design basis for the Auxiliary Feedwater (AFW) System during a loss of offsite power?

- a. Prevents relief through the PZR safety valves by removing core decay heat only.
- b. Prevents relief through the S/G safety valves by removing core decay heat only.
- c. Prevents relief through the PZR safety valves by removing core decay heat and stored RCS heat .
- d. Prevents relief through the S/G safety valves by removing core decay heat and RCP heat.

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56. Given the following plant conditions:

- Unit is at 100% power.
- "A" Waste Gas Compressor is in service.
- Pressure in the "in service" Waste Gas Decay Tank (WGDT) is 60 psig.
- No WGDT release is in progress
- The relief valve on the "in service" WGDT begins to experience seat leakage.

Which ONE of the following will provide the best indication that the relief valve on the WGDT is leaking?

- a. Increasing count rates on RM-90-101A, Auxiliary Building Vent Monitor.
- b. Increasing count rates on RM-90-400, Shield Building Vent Monitor.
- c. FCV 77-119, Plant Vent Flow Control valve, isolates due to high radiation.
- d. The Waste Gas Vent Header pressure increases causing the Waste Gas Compressor to run continuously.

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57. Given the following plant conditions:

- Loss of all Shutdown power occurred resulting in a reactor trip.
- Operators have implemented ECA-0.0, "Loss of Shutdown Power".
- RCS pressure is 280 psig.
- When RCS pressure could not be maintained > 280 psig, the Unit Supervisor directed the OAC to vent nitrogen from the accumulators.

Which ONE of the following identifies the basis for venting nitrogen from the accumulators?

- a. Prevents injection of additional inventory into the RCS which could result in a water solid condition and further degradation of the RCS pressure boundary.
- b. Prevents erratic RVLIS indications due to pressure pulses as the accumulators alternately start/stop injecting during RCS depressurization.
- c. Prevents sudden cooldown of the RCS cold legs by allowing accumulator injection to proceed more slowly along with depressurization of the RCS.
- d. Prevents injection of nitrogen into the RCS which may impede further RCS pressure control.

58. Given the following plant conditions:

- A source check is being performed on Spent Fuel Pool Monitor (RE-90-102).
- Auto Block handswitches are in the OFF position.

Which ONE of the following will occur when the control switch is placed in "SOURCE CHECK"?

- a. The fuel handling area ventilation system is diverted to the suction of the EGTS system.
- b. The green light on the monitor goes out indicating that the monitor is being source checked.
- c. Auxiliary Building Ventilation isolates, but no Auxiliary Building isolation signal is generated.
- d. A Containment Ventilation Isolation signal is generated.



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59. Given the following plant conditions:

- Plant is operating at 100% power
- Annunciator window 174E, "1-RR-90-1 Area Monitors Instr Malf" is in alarm.

Which ONE of the following conditions would cause the annunciation?

- a. Internal power supply blown fuse on 1-RM-90-1, Spent Fuel Pit Area radiation monitor.
- b. Vent Isolation Rad Mon Block switch, 0-HS-90-136A1, selected to 1-130 and pulled.
- c. Function switch for 1-RM-90-102, Spent Fuel Pit monitor, in the Alarm Adj position.
- d. 1-RM-90-6, CCS HXs radiation monitor becomes saturated (offscale high).

60. Given the following plant conditions:

- The reactor is at 100% power
- Rod control is in automatic.
- Power Range nuclear instrument N-42 fails HIGH.

Which ONE of the following describes the rod control and plant response?

- a. Rods move in until the power mismatch rate signal decays, then move out to the original position to correct the temperature error.
- b. Rods move in until the power mismatch rate signal decays, then remain at the new position with a reduced T-avg.
- c. Rods move out until the power mismatch rate signal decays, then move in to the original position to correct the temperature error.
- d. Rods move out until the high power rod block is reached, then remain at the new position with a higher T-avg.

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61. Given the following plant conditions:

- Unit was at 100% power.
- A spurious Safety Injection occurs.
- Operators are responding per the EOP network and have just transitioned to ES-1.1, "SI Termination".
- Annunciators "PRT LEVEL HI/LO, PRESS HI, and TEMP HI" alarm.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

- a. Pressurizer PORVs, 1-PCV-68-340 and 334, have lifted.
- b. CVCS Letdown Header Relief valve, 1-RLF-62-662 has lifted.
- c. RHR Pump Discharge Relief valve, 1-RLF-63-620, has lifted.
- d. RCP #1 Seal Leakoff Relief Valve, 1-RLF-62-636, has lifted.

62. Given the following plant conditions:

- Operating at 100% power.
- PZR PORV, PCV 68-340, is leaking through.
- PRT pressure increases resulting in rupture of the PRT diaphragm.

What effect will the rupture of the PRT diaphragm have on PRT temperature and leakage through the PORV?

	<u>PRT Temp</u>	<u>PORV Leakage</u>
a.	Rises	Rises
b.	Rises	Drops
c.	Drops	Rises
d.	Drops	Drops

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63. Given the following plant conditions:

- Unit is operating at 100% power.
- PZR PORV testing is in progress
- While Operators are raising PRT level to reduce PRT Oxygen content the PRT PRESS HI alarm annunciates.

Which ONE of the following automatic actions will occur?

- a. The WDS vent header control valve PCV-68-301 will CLOSE.
- b. The primary water supply valve, FCV-68-303 will CLOSE.
- c. The PRT drain valve to RCDT FCV-68-310 will OPEN.
- d. The PRT nitrogen supply isolation valve FCV-68-305 will CLOSE.

64. Which ONE of the following would result in the OP Δ T reactor protection trip setpoint being reduced? Consider each parameter independently.

- a. ΔT increasing.
- b. T_{avg} increasing.
- c. PRZ pressure decreasing.
- d. Reactor Power decreasing.

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65. Given the following plant conditions:

- The operating crew is responding to a reactor trip due to a loss of 120V AC Vital Instrument Power Bd I.
- PZR pressure transmitter 68-334 (Channel II) failed LOW.

Which ONE of the following describes the plant response?

- a. Both trains of SSPS SI master relays would actuate AND both trains of ECCS equipment auto start.
- b. Both trains of SSPS SI master relays would actuate BUT only "B" train ECCS equipment auto start.
- c. Only the "B" train SSPS SI master relays would actuate BUT both trains of ECCS equipment auto start.
- d. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment auto start.

66. Given the following plant conditions:

- Unit is in Mode 3 with Tavg at 557°F.
- Steam Dump Mode selector switch in the STEAM PRESSURE mode.
- Pressure transmitter, 1-PT-1-33, fails HIGH

Which ONE of the following describes the effect on the Steam Dump system?

- a. Only six valves will open and remain open.
- b. Only six valves will open and then close when Tavg decreases to 550°F.
- c. Twelve valves will open and will remain open.
- d. Twelve valves will open and then close when Tavg decreases to 550°F.

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67. Which ONE of the following correctly describes the operation of the Median Signal Select (MSS) circuitry associated with Steam Generator (S/G) controls and protection?
- a. The (MSS) averages three channels from each S/G and assigns all control and protection functions to the average values.
 - b. The (MSS) looks at all three channels of each S/G, selects the median channel and assigns all protection and control functions to that channel.
 - c. The (MSS) compares the Median value of all S/Gs, averages them, then uses this value for all control functions and allows all channels to retain their separation as protection channels.
 - d. The (MSS) looks at all three channels of each S/G, selects the median channel for control and allows all channels to retain their separation as protection channels.
68. Given the following plant conditions:
- Large break LOCA has occurred.
 - Swapover to containment sump was unsuccessful and crew has implemented ECA-1.1, "Loss of RHR Sump Recirculation".
 - Containment Spray has been aligned to the containment sump.
 - Unit Supervisor has directed the OAC to initiate makeup to the RWST.

Which ONE of the following lists the preferred makeup source to the RWST?

- a. Transfer water from the Holdup Tank.
- b. Transfer water from the Spent Fuel Pit.
- c. Align Containment Spray to the RWST.
- d. Align CVCS blender to makeup.

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69. Given the following plant conditions:

- Plant is in MODE 6 with refueling in progress.
- During movement of an irradiated fuel assembly from the core it is dropped and severely damaged.
- The containment airborne radioactivity increases.

Which ONE of the following describes the ESF actuation that would occur?

- a. Phase A Containment Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- b. Phase A Containment Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.
- c. Containment Vent Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- d. Containment Vent Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.

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70. Given the following plant conditions:

- Operators are performing AOI-27, "MCR Inaccessibility".
- Crew is ready to transfer controls back to MCR.
- Auxiliary Feedwater level controllers in the Aux. Control Room (ACR) are in automatic controlling S/G levels at 38%.

Which ONE of the following actions should be performed to prevent sudden changes in S/G levels when the controllers are transferred to the Main Control room (MCR)?

- a. Place MCR controller in automatic, this will allow it to automatically track the corresponding controller in the ACR.
- b. Plant conditions must be established to allow modulating components to be full open or closed prior to transfer.
- c. Place ACR and MCR controller in manual, when transferred to NORMAL, Eagle 21 control will match the two controller's outputs.
- d. Place the MCR controller in manual and adjust the controller output to match the output of the ACR controller then transfer.

71. Given the following plant conditions:

- The unit is operating at 100% power
- The controlling #3 S/G pressure transmitter fails LOW.

Which ONE of the following describes the effect this will have on indicated steam flow and the initial #3 S/G FW Reg valve response?

	<u>Indicated Steam Flow</u>	<u>Valve Response</u>
a.	Drop	FCV will open
b.	Drop	FCV will close
c.	Rise	FCV will open
d.	Rise	FCV will close

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72. Given the following plant conditions:

- Startup in progress.
- Operators are warming the main steam lines using the MSIV bypasses.
- The OAC observes that the RCS has cooled down 108°F in the past hour.
- The CRO observes that the main steam lines have heated up 102°F in the past hour.

Which ONE of the following indicates the actions that should be taken by the operators and why?

- a. Close the MSIV bypass valves; RCS cooldown limit was exceeded.
- b. Close the MSIV bypass valves; main steam line heat-up limit was exceeded.
- c. Close the MSIV bypass valves; both RCS and main steam line limits were exceeded.
- d. Leave MSIV bypass valves open; NO RCS or main steam line limits were exceeded.

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73. Given the following plant conditions:

- Reactor coolant system pressure has decreased to 1930 psig during a plant cooldown.
- The operator has placed the Low Steam Line Pressure Block switches HS-63-135 A & B to BLOCK.

Which ONE of the following describes the status of the Safety Injection and Main Steam Line isolation signals?

- a. Only the low steamline pressure MSIV isolation is blocked; low steamline pressure SI is operational.
- b. Only the low steamline pressure SI signal is blocked; low steam line pressure MSIV isolation is operational.
- c. Both the high steamline pressure negative rate MSIV isolation and high steamline pressure negative rate SI signal are operational.
- d. Both the low steam line pressure MSIV isolation and low steam line pressure SI signal are blocked.

74. Given the following plant conditions:

- Reactor tripped on lo-lo SG level.
- All MSIVs are closed.
- All feedwater reg and bypass reg valves are closed.
- Turbine Driven AFW pump is the ONLY AFW pump running.
- All DGs are running unloaded.

Which ONE of the following correctly lists the 125V DC Vital Battery Board(s) that is/are deenergized?

- a. Only Board I.
- b. Only Board III.
- c. Board I and II.
- d. Board I and III.

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75. Given the following plant conditions:

- Unit at 100% power.
- 1A-A D/G Battery Abnormal annunciation is in alarm
- An AUO is dispatched and confirms that the power supply to the 1A-A D/G Battery Charger is deenergized.

A loss of the bus from which ONE of the following power supplies would account for this condition?

- a. 1A1-A 480V Shutdown Board
- b. 1A2-A 480V Diesel Aux Board
- c. 120V Vital Instrument Power Board I-III
- d. 1A1-A 480V Reactor MOV Board

76. Given the following plant conditions:

- Plant is at 100% power
- 1A-A Diesel Generator (D/G) running for a surveillance test.

Which ONE of the following identifies how fuel oil makeup occurs to the 1A-A D/G Day Tanks while the D/G is running?

- a. Automatically from the 7-day tanks using the D/G mounted fuel oil transfer pumps.
- b. Manually from the 7-day tanks using the D/G mounted fuel oil transfer pumps.
- c. Automatically from the south (No. 1) Fuel Oil Storage Tank using the D/G building transfer pump.
- d. Manually from the south (No. 1) Fuel Oil Storage Tank using the D/G building transfer pump.

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77. Given the following plant conditions:

- Unit is at 100% power
- High radiation alarms are in on Steam Generator Blowdown (SGBD) radiation monitors 1-RM-90-120 and 121.

Which ONE of the following describes the SGBD System response?

- a. The SGBD Containment isolation valves, FCV-15-181 through 184, close.
- b. The SGBD Cooling Tower blowdown isolation valve, FCV-15-44, closes.
- c. The SGBD to Condensate Header isolation Valve, FCV-15-6, closes.
- d. The SGBD flow control valve, FCV-15-43, closes.

78. Given the following conditions:

- A loss of offsite power has occurred.
- Tavg is 557°F.
- Steam Dump controls are in the Steam Pressure mode.
- Steam dump demand is manually increased to begin cooldown.
- Steam Dump valves will NOT open.

Which ONE of the following explains why the Steam Dump valves will NOT open?

- a. P-4, Reactor Trip, has not been actuated.
- b. C-9, Condenser Available, interlock is not met.
- c. P-12, Lo-Lo Tavg, has disarmed the Steam Dump system.
- d. C-7, Load Rejection controller, has not been actuated.

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79. Given the following plant conditions:

- Reactor trip and safety injection occurred while the plant was operating at 100% power.
- Four ERCW pumps were running in their normal alignment before the SI occurred.

Which ONE of the following identifies ERCW pump status after the SI and the effect it has on the Condenser Circulating Water (CCW) system make-up?

- a. Four ERCW pumps running; CCW make-up is provided only from ERCW since RCW bypass strainer is isolated.
- b. Eight ERCW pumps running; CCW make-up is provided only from RCW since ERCW is routed through the overflow structure.
- c. Four ERCW pumps running; CCW make-up provided from both RCW and ERCW.
- d. Eight ERCW pumps running; CCW make-up is not required since the unit is tripped.

80. Given the following plant conditions:

- Unit was operating at 100% power.
- A large break LOCA resulted in a reactor trip and safety injection.
- Alignment to Cold Leg Recirculation is in progress.
- 1-FCV-63-8, 1A-A RHR Pump to CCP suction, will NOT open from the Control Room.

Assuming all other equipment functions as expected, which ONE of the following would prevent the valve from opening?

- a. SI pump minimum flow valve 1-FCV-63-175 open.
- b. RHR pump suction from RWST 1-FCV-63-1 open.
- c. Containment sump suction valve 1-FCV-63-72 closed.
- d. The A train safety injection signal has been reset.

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81. Given the following plant conditions:

- Plant is at 100% power.
- While making plant rounds the Auxiliary Building NAUO discovered that the 1A-A RHR Pump discharge flow indicating switch, 1-FIS-74-12, is indicating 1500 gpm flow.
- An inadvertent safety injection occurs (SI).

Which ONE of the following identifies the impact of this instrument failure on 1A-A RHR pump mini-flow valve?

	<u>PRIOR to pump start</u>	<u>AFTER Pump start</u>
a.	Open	Open
b.	Closed	Closed
c.	Closed	Open
d.	Open	Closed

82. Given the following plant conditions

- Unit is at 100% power.
- 1A-A 6.9 KV Shutdown Board is out of service for maintenance.
- A reactor trip and safety injection (SI) is initiated due to a large break LOCA.
- Automatic and manual "B" train Safety Injection fails to actuate.

With no further operator action, which ONE of the following describes the status of the Emergency Gas Treatment System (EGTS)?

- a. Both trains are running
- b. Only "A" train is running
- c. Only "B" train is running
- d. Neither train is running

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83. Given the following plant conditions:

- A large break LOCA occurs from 100% power.
- "B" Hydrogen recombiner is tagged out.
- "A" Hydrogen Recombiner has been placed in service.
- Subsequently the "A" Hydrogen Recombiner trips on overcurrent.

Which ONE of the following indicates how the concentration of hydrogen will be controlled inside containment if the "A" Hydrogen Recombiner trips?

- a. Containment Purge Supply and Exhaust fans are placed in service to dilute the hydrogen concentration in containment.
- b. A continuous vent path is provided that allows hydrogen to vent to the annulus and then be removed by EGTS.
- c. Air Return Fans create a mixing effect and the hydrogen igniters will burn hydrogen to maintain it below an explosive concentration.
- d. Emergency Gas Treatment System will remove hydrogen which collects in the containment dome and discharge to the shield building vent.

84. Which ONE of the following describes a feature of the Refueling Machine designed to prevent the accidental release of a fuel assembly?

- a. Gripper is mechanically engaged and disengaged by remote operating handle on bridge and requires no power or air to operate.
- b. Gripper requires air to disengage, however a mechanical latch prevents gripper release under load even if air is applied.
- c. Gripper disengages upon loss of air, however a mechanical latch prevents gripper release under load even if air is removed.
- d. When gripper is engaged, operators mechanically lock gripper in place with extension shaft which must be unlocked before gripper can release.

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85. Given the following plant conditions:

- Core load is in progress.
- A failure of the Reactor Cavity Seal occurred.
- Cavity level is currently el. 748' and dropping slowly.

Which ONE of the following actions is required per AOI-29, "Dropped or Damaged Fuel or Refueling Cavity Seal Failure"?

- a. Align RHR suction to the RWST and discharge to the RCS through the hot legs.
- b. Align CCP suction to RWST and discharge to the RCS through normal charging.
- c. Start one SI pump in the cold leg injection flowpath for cavity makeup.
- d. Align Refueling Water Purification pumps suction to RWST and discharge directly to refueling cavity.

86. Given the following plant conditions:

- Unit 1 at 20% RTP
- Turbine trip occurs without a Reactor trip.

- The Steam Dump System is in T-avg Mode.
- Rod Control is in Automatic

Which ONE of the following describes the effect of the Turbine trip on the Steam Dump and the Rod Control Systems? Assume no operator actions.

- a. The Steam Dump System will maintain T-avg at 562° F with all Control Rods fully inserted.
- b. The Steam Dump System will maintain T-avg at 557° F with all Control Rods fully inserted.
- c. The Steam Dump System will maintain T-avg at 562° F with Control Rods maintaining ≈15% Reactor power due to C-5.
- d. The Steam Dump System will maintain T-avg at 557° F with Control Rods maintaining ≈15% Reactor power due to C-5.

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87. Which ONE of the following describes the source of instrument air and the effect of a loss of instrument air on the Main Steam Isolation Valves (MSIVs)?
- a. Non-essential air; MSIVs fail CLOSED.
 - b. Non-essential air; MSIVs fail OPEN.
 - c. Essential air; MSIVs fail CLOSED.
 - d. Essential air; MSIVs fail OPEN.
88. Given the following plant conditions:
- Unit at 100% RTP
 - A S/G #1 safety valve begins leaking and power increases to 105% RTP.
 - The crew enters AOI-38 and reduces turbine load to 90% with the valve position limiter.
 - This load reduction caused reactor power to decrease to 95% RTP.

Which ONE of the following would be the correct crew response per AOI-38 if the flow increased through the leaking safety valve causing the reactor power to return to 101%?

- a. Decrease turbine load at 5%/min to reduce reactor power to <100% and continue AOI-38.
- b. Use the valve position limiter to maintain power <100% and continue AOI-38.
- c. Trip the reactor, close the MSIVs and bypasses, and go to E-0.
- d. Trip the reactor, initiate SI, close the MSIVs and bypasses and go to E-0.

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89. Given the following plant conditions:

- Inadvertent Safety Injection (SI) has occurred.
- The operating crew implemented the EOPs and is currently performing ES-1.1, "SI Termination".
- The Unit Supervisor (US) directs the Operator at the Controls (OAC) to "OPEN charging isolation 1-FCV-62-90 and 1-FCV-62-91".

Which ONE of the following communication exchanges between the OAC and US would meet the minimum expectations of Watts Bar Communication Guidelines for repeat back?

- a. OAC - "Opening 1-FCV-62-90 and 1-FCV-62-91".
US - No response required.
- b. OAC - "Opening the valves".
US - No response required.
- c. OAC - "Opening 1-FCV-62-90 and 1-FCV-62-91".
US - "That is correct".
- d. OAC - "Opening the valves".
US - "That is correct".

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

90. Given the following plant conditions:

- Unit is at 100% power with automatic VCT make-up is in progress.
- A VCT level transmitter failure resulted in make-up stopping with level at 34%.

Which ONE of the following identifies additional indications and effects of this failure?

	<u>Indications</u>	<u>Effects</u>
a.	Control board meter indicates 100%	1-LCV-62-118 full diverted
b.	Control board meter indicates 0%	1-LCV-62-118 aligned to VCT
c.	ICS computer indicates 100%	1-LCV-62-118 full diverted
d.	ICS computer indicates 0%	1-LCV-62-118 aligned to VCT

91. Given the following plant conditions:

- Unit is in Mode 3
- Reactor trip breakers are closed
- RCS Tavg is 559°F
- A dilution to obtain the calculated critical boron concentration in progress.

Which ONE of the following is allowed per GO-2, "Reactor Startup"?

- a. Testing of one SRM.
- b. Stopping of an operating RCP.
- c. Withdrawal of the Shutdown Rods.
- d. Energization of the PZR backup heaters.

**WATTS BAR NUCLEAR PLANT
REACTOR OPERATOR
NRC EXAMINATION**

92. Given the following plant conditions:

- Unit is operating at 100% power
- 1-FCV-62-93, Charging Flow Control Valve, is being tagged as a boundary isolation valve for a clearance on the CVCS charging header.

Which ONE of the following is an acceptable for tagging the valve?

- a. Tag the air isolation valve in the open position and tag the handswitch in the closed position for 1-FCV-62-93.
- b. Close the valve, install a jacking device, isolate the air supply for 1-FCV-62-93, and tag the jacking device.
- c. Dog 1-FCV-62-93 closed with its handwheel, tag the valve handwheel, and tag the air isolation valve.
- d. Isolate and de-pressurize the air supply for 1-FCV-62-93 and tag the air isolation valve.

93. Given the following plant conditions:

- Unit is in Mode 6.
- Refueling operations are in progress.
- The 30th fuel assembly is being loaded into the core.

According to FHI-7, "Fuel Handling and Movement", which ONE of the following would require fuel loading operations to be stopped immediately?

- a. An unanticipated increase in count rate by a factor of two occurs on any responding nuclear channel during any single loading step.
- b. Communications is lost between Containment and the Control Room.
- c. Water in the Spent Fuel Pit is not clear enough to view the Fuel top Nozzles without supplemental lighting.
- d. Boron concentration decreases by more than 10 ppm as determined by two successive samples of Reactor Coolant.

**WATTS BAR NUCLEAR PLANT
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NRC EXAMINATION**

96. Which ONE of the following identifies the first radiation monitor that should respond to a SGTR and the effect on the monitor?
- a. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will be automatically isolated.
 - b. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will NOT be automatically isolated.
 - c. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will be automatically isolated.
 - d. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will NOT be automatically isolated.

97. Given the following conditions:

- Unit 1 in MODE 1 at 10% RTP.
- Turbine at 1800 rpm at no load (generator PCB open).
- Loss of offsite power occurs.
- Emergency Diesels fails to re-energize Shutdown Boards.

Which ONE of the following describes the correct usage of the Emergency Instructions?

- a. Go directly to ECA-0.0 without entering E-0.
- b. Implement ECA-0.0 in conjunction with E-0.
- c. Go to ECA-0.0 from E-0 after verifying reactor and turbine trip.
- d. Complete E-0 IMMEDIATE ACTIONS then go immediately to ECA-0.0.

**WATTS BAR NUCLEAR PLANT
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98. A step in ES-1.3, "Transfer to RHR Containment Sump", reads as follows:

ISOLATE SI pump miniflow:

- CLOSE FCV-63-3.
- CLOSE FCV-63-175.
- CLOSE FCV-63-4.

The bullets ("•") indicate that:

- a. The actions must be performed in the specified sequence, but once a step is in progress, the next step may be started.
- b. The actions must be performed and completed in the specified sequence.
- c. These actions should have been completed, so only verification may be required.
- d. These actions must all be completed, but any sequence of completion is allowed.

99. Given the following plant conditions:

- Control room was abandoned due to a fire.
- All controls have been transferred in accordance with AOI-30.2, Fire Safe Shutdown.
- The plant is being maintained in Hot Standby

RCS temperature is being controlled using _____ (1) _____ and RCS pressure is controlled using _____ (2) _____?

- a. (1) Condenser steam dumps; (2) PZR back-up heater group C.
- b. (1) Condenser steam dumps; (2) PZR back-up heater groups A-A and B-B.
- c. (1) Atmospheric steam dumps; (2) PZR back-up heater group C.
- d. (1) Atmospheric steam dumps; (2) PZR back-up heater groups A-A and B-B.

**WATTS BAR NUCLEAR PLANT
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100. Following Safety Injection reset during ES-1.1 the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PZR heater status the OAC would observe?

- a. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- b. Control group 1D ON.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- c. Control group 1D OFF.
Backup group 1C ON.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- d. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A ON.
Backup group 1B-B ON.

WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION

NAME _____

SSN _____

- 1. (a) (b) (c) (d)
- 2. (a) (b) (c) (d)
- 3. (a) (b) (c) (d)
- 4. (a) (b) (c) (d)
- 5. (a) (b) (c) (d)
- 6. (a) (b) (c) (d)
- 7. (a) (b) (c) (d)
- 8. (a) (b) (c) (d)
- 9. (a) (b) (c) (d)
- 10. (a) (b) (c) (d)
- 11. (a) (b) (c) (d)
- 12. (a) (b) (c) (d)
- 13. (a) (b) (c) (d)
- 14. (a) (b) (c) (d)
- 15. (a) (b) (c) (d)
- 16. (a) (b) (c) (d)
- 17. (a) (b) (c) (d)

- 18. (a) (b) (c) (d)
- 19. (a) (b) (c) (d)
- 20. (a) (b) (c) (d)
- 21. (a) (b) (c) (d)
- 22. (a) (b) (c) (d)
- 23. (a) (b) (c) (d)
- 24. (a) (b) (c) (d)
- 25. (a) (b) (c) (d)
- 26. (a) (b) (c) (d)
- 27. (a) (b) (c) (d)
- 28. (a) (b) (c) (d)
- 29. (a) (b) (c) (d)
- 30. (a) (b) (c) (d)
- 31. (a) (b) (c) (d)
- 32. (a) (b) (c) (d)
- 33. (a) (b) (c) (d)
- 34. (a) (b) (c) (d)

- 35. (a) (b) (c) (d)
- 36. (a) (b) (c) (d)
- 37. (a) (b) (c) (d)
- 38. (a) (b) (c) (d)
- 39. (a) (b) (c) (d)
- 40. (a) (b) (c) (d)
- 41. (a) (b) (c) (d)
- 42. (a) (b) (c) (d)
- 43. (a) (b) (c) (d)
- 44. (a) (b) (c) (d)
- 45. (a) (b) (c) (d)
- 46. (a) (b) (c) (d)
- 47. (a) (b) (c) (d)
- 48. (a) (b) (c) (d)
- 49. (a) (b) (c) (d)
- 50. (a) (b) (c) (d)
- 51. (a) (b) (c) (d)

WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION

NAME _____

SSN _____

52. (a) (b) (c) (d)

53. (a) (b) (c) (d)

54. (a) (b) (c) (d)

55. (a) (b) (c) (d)

56. (a) (b) (c) (d)

57. (a) (b) (c) (d)

58. (a) (b) (c) (d)

59. (a) (b) (c) (d)

60. (a) (b) (c) (d)

61. (a) (b) (c) (d)

62. (a) (b) (c) (d)

63. (a) (b) (c) (d)

64. (a) (b) (c) (d)

65. (a) (b) (c) (d)

66. (a) (b) (c) (d)

67. (a) (b) (c) (d)

68. (a) (b) (c) (d)

69. (a) (b) (c) (d)

70. (a) (b) (c) (d)

71. (a) (b) (c) (d)

72. (a) (b) (c) (d)

73. (a) (b) (c) (d)

74. (a) (b) (c) (d)

75. (a) (b) (c) (d)

76. (a) (b) (c) (d)

77. (a) (b) (c) (d)

78. (a) (b) (c) (d)

79. (a) (b) (c) (d)

80. (a) (b) (c) (d)

81. (a) (b) (c) (d)

82. (a) (b) (c) (d)

83. (a) (b) (c) (d)

84. (a) (b) (c) (d)

85. (a) (b) (c) (d)

86. (a) (b) (c) (d)

87. (a) (b) (c) (d)

88. (a) (b) (c) (d)

89. (a) (b) (c) (d)

90. (a) (b) (c) (d)

91. (a) (b) (c) (d)

92. (a) (b) (c) (d)

93. (a) (b) (c) (d)

94. (a) (b) (c) (d)

95. (a) (b) (c) (d)

96. (a) (b) (c) (d)

97. (a) (b) (c) (d)

98. (a) (b) (c) (d)

99. (a) (b) (c) (d)

100. (a) (b) (c) (d)

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

1. 005AK3.02 001

Given the following plant conditions:

- Reactor is at 75% with a power increase in progress using control rods.
- The OAC determines that Control Bank D rod H-12 is not moving and is 14 steps below the other rods in D bank.
- Crew is performing AOI-2, "Malfunction of Reactor Control System" to realign control rod H-12 with the bank.

Which ONE of the following describes how control rod H-12 will be realigned to control bank D and how control bank insertion limit will change following the realignment?

- a. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be higher.
- ✓b. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be lower
- c. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be lower.
- d. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be higher.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

2. 011EK2.02 001

Given the following conditions:

- A large break LOCA occurred
- Operators have just completed swapover to Containment Sump
- A loss of offsite power occurs

Which ONE of the following describes the actions required for this condition?

- a. Pull to lock SI pumps and CCPs until the RHR pumps have been restarted after the shutdown boards are reenergized.
- ✓b. Pull to lock the CCPs until the RHR pumps are restarted after the shutdown boards are reenergized.
- c. Ensure both RHR pumps are started by the blackout sequencer after the diesel generators reenergize the shutdown boards then restart the SI pumps.
- d. Ensure all ECCS pumps are started by the blackout sequencer when the diesel generators reenergize the shutdown boards.

3. 015AK1.05 001

Given the following plant conditions:

- Reactor power is stable at 30%
- Loop 1 RCP trips

Assuming reactor power remains constant, core exit temperature will:

- ✓a. increase, then stabilize at a higher value.
- b. decrease, then stabilize at a lower value.
- c. increase, then return to the original steady-state value.
- d. decrease, then return to the original steady-state value.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

4. 017AK3.03 001

Given the following conditions:

- Unit at 60% power.
- Confirmed Loop 1 RCP shaft vibration of 25 mils.

Which ONE of the following statements is correct per AOI-5, "Unscheduled Removal of One RCP", regarding the sequence of actions?

- a. RCP should be tripped prior to the reactor trip to minimize pump damage.
- b. The reactor should be tripped prior to tripping the RCP to prevent pressurizer level from dropping below 17%.
- c. RCP should be tripped prior to the reactor trip to prevent Reactor Coolant Bus voltage from dropping and tripping additional RCPs.
- ✓d. The reactor should be tripped prior to tripping the RCP to prevent an automatic trip and an unnecessary challenge to a safety system.

5. 017AA1.13 001

Given the following plant conditions:

- Unit was operating at 58% power.
- Problems with #4 RCP required the pump to be shut down in accordance with AOI-5, "Unscheduled Removal of One RCP".

AOI-5 requires the plant to be in which ONE of the following conditions for restart of #4 RCP?

- ✓a. < P-10.
- b. < P-9.
- c. < P-8.
- d. Mode 3.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

6. 024G2.4.16 001

Given the following plant conditions:

- Unit has experienced a Reactor trip.
- The crew transitions to ES-0.1, Reactor Trip Reponse.
- RCS temperature has dropped to 542°F.
- Step 2 RNO states:
 - REFER to AOI-34, Immediate Boration.

As the procedure reader, which ONE of the following is the proper method of applying this step?

- a. Transition from ES-0.1 to AOI-34 and when AOI-34 is completed return to ES-0.1.
- b. Read steps from AOI-34 in conjunction with ES-0.1 on a not to interfere basis.
- ✓c. Continue in ES-0.1 and assign AOI-34 to another control room team member.
- d. Assign ES-0.1 to another control room team member and transition to AOI-34.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

7. 024AK1.02 001

Given the following plant conditions:

- Plant was operating at 100% power when a Main Feedwater pump trip resulted in a turbine runback.
- All systems in automatic and responded as expected to stabilize the plant.
- Control rods inserted beyond the Lo-Lo Rod Insertion limits.
- Operators implemented AOI-34, "Immediate Boration", in accordance with the ARI.

Which ONE of the following indicates the final, stable plant conditions AFTER completion of the boration as compared to those PRIOR to the boration?

	<u>Reactor Power</u>	<u>Rod Position</u>	<u>Tavg</u>
a.	Same	Higher	Higher
✓b.	Same	Higher	Same
c.	Lower	Lower	Same
d.	Lower	Lower	Lower

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

8. 029EA1.02 001

Given the following plant conditions:

- ATWS without Safety Injection has occurred.
- Crew has implemented FR-S.1, "Nuclear Power Generation/ATWS", and currently performing step 4 to borate the RCS.

Which ONE of the following identifies the correct Operator action that must be taken in order to align charging pump suction?

- a. CLOSE LCV-62-132 and 133, VCT outlet isolation, then OPEN LCV-62-135 and 136, RWST supply to charging pump suction.
- ✓b. OPEN LCV-62-135 and 136, RWST supply to charging pump suction, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- c. Verify LCV-62-135 and 136, RWST supply to charging pump suction AUTO OPEN, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- d. Verify LCV-62-135 and 136, RWST supply to charging pump suction and LCV-62-132 and 133, VCT outlet isolation AUTO OPEN.

9. 055EA2.05 001

Given the following plant conditions:

- The reactor trips due to a loss of all AC power (Station Blackout)
- The crew is currently performing ECA-0.0, Loss of Shutdown Power.
- Non-essential 125V and 250V battery loads are being shed per AOI-40, Station Blackout.
- The power loss occurred at 0938 hours.

Which ONE of the following is the latest time that AC power must be restored to ensure the station batteries are not fully discharged?

- a. 1138
- ✓b. 1338
- c. 1538
- d. 1738

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

10. 055G2.4.45 001

Given the following plant conditions:

- Plant was operating at 100% power when a loss of offsite power occurred.
- Emergency Diesel Generators (D/G) failed to start and tie on to their associated 6.9KV Shutdown Boards.
- The operating Crew implemented ECA-0.0, "Loss of Shutdown Power".
- The OAC has started 1A-A D/G and re-energized it's associated Shutdown Board.
- Annunciator, "LOGIC PNL 1A-A LOAD STRIP RELAYS OUT OF SYNC OR UV TEST" (BO-AN alarm), is still LIT.

Which ONE of the following actions is required before this annunciator may be reset?

- a. Reset D/G 1A-A 86 LOR relay.
- ✓b. Reset 1A-A Shutdown Board BOX and BOY relays.
- c. Transfer 1A-A Shutdown Board to it's normal power supply.
- d. Shutdown all the D/Gs that are not tied to associated Shutdown Board.

**WATTS BAR NUCLEAR PLANT
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NRC EXAMINATION**

11. 057AA1.05 001

Given the following plant conditions:

- Plant is operating at 100% power.
- A loss of 120V AC Vital Instrument Power Board 1-I occurred.
- The crew implements AOI-25.01, "Loss of 120V AC Vital Instrument Power Board 1-I".

Which ONE of the following identifies the train selector switches that must be selected for automatic control of feedwater and which loop 1 feedwater/steam flow indications are available?

	<u>Feedwater/Steam Flow Selector Switches</u>	<u>Feedwater/Steam Flow Indications</u>
a.	A train	Channel I
b.	A train	Channel II
c.	B train	Channel I
✓d.	B train	Channel II

12. 059AK1.01 001

Given the following plant conditions:

- Plant is operating a 100% power.
- Plant systems aligned and operating normally.
- Annunciator, CCS HX A 1-RM-90-123 LIQ RAD HIGH, is in alarm.

Which ONE of the following lists the type and source of radiation sensed by the radiation monitor that is in alarm?

- ✓a. Gamma; Thermal Barrier leakage.
- b. Beta; Thermal Barrier leakage.
- c. Gamma; RCP motor cooler leakage.
- d. Beta; RCP motor cooler leakage.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

13. 069AK2.03 001

Which ONE of the following conditions concerning the Personnel Airlock would exceed a Limiting Condition for Operation and require entering an Action Statement of Technical Specifications?

- a. The lower containment airlock fails its LLRT while control rod unlatching is in progress.
- b. Welding cables are laid through both lower containment airlock doors during RCS fill and vent at the end of an outage.
- c. The lower containment airlock door interlocks are defeated while reactor vessel head is being tensioned.
- ✓d. The outer and inner doors are opened simultaneously during a normal cooldown prior to aligning RHR to the RCS.

14. 074EA2.04 001

Which ONE of the following is the reason S/Gs are depressurized to atmospheric pressure during the performance of FR-C.1, "Response to Inadequate Core Cooling"?

- a. Reduces RCS temperature to increase the thermal driving head for natural circulation.
- b. Reduces RCS temperature to collapse any steam voids in the upper part of the vessel.
- c. Reduces RCS pressure which prevents the formation of superheated steam in the core as water exceeds the critical point
- ✓d. Reduces RCS pressure to allow the ECCS accumulators and RHR pumps to inject water to the RCS.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

15. 074EK1.03 001

Given the following plant conditions:

- Inadequate core cooling conditions exist
- Crew is performing FR-C.1, Inadequate Core Cooling

Which ONE of the following sets of actions states the proper sequence of the major action categories to be performed for removing decay heat from the core?

- a. Rapid secondary depressurization; reinitiation of high head safety injection; RCP restart
- ✓b. Reinitiation of high head safety injection; rapid secondary depressurization; RCP restart
- c. Rapid secondary depressurization; RCP restart; reinitiation of high head safety injection
- d. RCP restart; rapid secondary depressurization; reinitiation of high head safety injection

16. 076AA1.04 001

Which ONE of the following correctly describes the indication on the main steam line radiation monitors when the MR/HR AUTO pushbutton is lit on the RM-23 readout module?

- a. Indicates low range output only.
- ✓b. Indicates high range output only.
- c. Automatically switches between the low and high range outputs every 45 seconds.
- d. Automatically switches between low and high range output based upon activity level in order to maintain accurate indication.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

17. E01EK3.4 001

Once an operating crew has entered the EOP network, which ONE of the following is the earliest that a transition may be made to ES-0.0, "Rediagnosis"?

- ✓a. AFTER transition from E-0 and safety injection initiated.
- b. AFTER transition from E-0 and NO safety injection initiated.
- c. BEFORE transition from E-0 and safety injection initiated.
- d. BEFORE transition from E-0 and NO safety injection initiated.

18. E02EA2.2 001

Given the following conditions:

- Main steam line break has occurred outside containment, resulting in a reactor trip/safety injection (SI).
- MSIV closure stopped the steam release.
- SI termination criteria was met and the crew is currently terminating the SI per ES-1.1, "SI Termination."

Which ONE of the following combinations of parameters would require an immediate reinitiation of safety injection?

	<u>Maximum CTMT Press</u>	<u>RCS Subcooling</u>	<u>RCS Pressure</u>	<u>PZR Level</u>
a.	1 psig	75°F	Stable	18%
b.	2 psig	72°F	Decreasing	20%
c.	3 psig	87°F	Decreasing	34%
✓d.	4 psig	60°F	Stable	24%

**WATTS BAR NUCLEAR PLANT
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NRC EXAMINATION**

19. EO6EK2.1 001

Given the following plant conditions:

- Operators are responding to a large break LOCA and have determined that degraded core cooling conditions exist.
- The crew has implemented FR-C.2, "Degraded Core Cooling".
- Preparations are in progress to depressurize all intact S/Gs to atmospheric pressure in accordance with FR-C.2.

Which ONE of the following is the reason the procedure directs all RCPs be stopped prior to performing the depressurization?

- a. Reduces the core ΔP which will enhance the ability of the RHR pumps to inject into the core.
- b. Minimizes heat input to the S/Gs allowing them to depressurize faster.
- c. Limits heat removal requirements to the core decay heat only.
- ✓d. Anticipates a loss of RCP #1 seal ΔP requirements.

20. E07EK2.1 001

Given the following plant conditions:

- A large break LOCA has occurred that resulted in saturated core cooling conditions.
- RWST level is 28%
- Crew is performing step 4 of FR-C.3, Saturated Core Cooling to establish SI pump valve alignment.

Which ONE of the following identifies valves that should be verified CLOSED during performance of this step?

- a. FCV-63-6, 7 and 177, SI pump and Charging pump suction from RHR.
- b. FCV-63-47 and 48, SI pump suction valves
- c. FCV-63-152 and 153, SI pump cold leg injection cross-tie valves
- ✓d. FCV-63-3, 4 and 175 SI pump mini-flow valves

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

21. E09G2.1.34 001

Given the following plant conditions:

- Reactor trip has occurred in conjunction with a loss of offsite power.
- The operating crew is currently performing steps of ES-0.2, "Natural Circulation Cooldown".
- Boration to Cold Shutdown boron concentration of 870 ppm has been completed.
- Chemistry reports the following boron concentrations:
 - 850 ppm in the pressurizer.
 - 1000 ppm in the RCS cold legs.

Which ONE of the following explains the difference in the boron concentration between the value calculated for Cold Shutdown and the values reported by Chemistry?

- ✓a. Mixing only occurs in the active portions of the RCS cold legs causing RCS boron concentration to be higher than calculated.
- b. The cold legs remain subcooled during this event which causes boron to concentrate in these areas.
- c. PZR spray valves failed to automatically open on increasing pressure to ensure mixing between the cold legs and PZR.
- d. Due to the loss of power the PZR heaters are unavailable to promote mixing between the loops and the PZR.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

22. E10EA2.1 001

Given the following plant conditions:

- Reactor trip occurred with subsequent loss of RCPs.
- Operators have implemented ES-0.2, "Natural Circulation Cooldown".
- A cooldown rate of 25°F/hour has been established.
- RCS depressurization has been initiated while maintaining subcooling > 165°F.
- Operators are monitoring PZR level and RVLIS for void formation.
- The OAC observes that loss of inventory in the Condensate Storage Tank is imminent.

Which ONE of the following describes the appropriate procedural actions?

- a. Stop the cooldown and remain in ES-0.2.
- b. Raise the cooldown rate and remain in ES-0.2.
- c. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and lower the cooldown rate.
- ✓d. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and raise the cooldown rate.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

23. E12EA2.2 001

Given the following plant conditions:

- Unit was at 100% power.
- A main steam line break occurred in the Turbine Building.
- Operators were unable to close the MSIVs and transitioned to ECA-2.1, Uncontrolled Depressurization of All Steam Generators.
- SI termination steps are in progress.
- Loop 3 MSIV is closed locally.
- The CRO observes the #3 SG pressure increasing slowly.

Which ONE of the following actions should be performed?

- a. Transition to E-2, "Faulted SG Isolation".
- b. Transition to ES-1.1, "SI Termination".
- c. Remain in ECA-2.1 until RHR is in service.
- ✓d. Remain in ECA-2.1 until SI is terminated.

24. E14EK3.2 001

Which ONE of the following describes the reason for tripping all RCPs during the performance of FR-Z.1, "High Containment Pressure"?

- a. Removes heat transferred to the Containment atmosphere from the RCP motors.
- b. Prevents depletion of primary inventory out of the break during a small LOCA.
- ✓c. Containment Isolation Phase B isolates cooling water to the RCPs and thermal barriers.
- d. Removes additional energy to the RCS during a break and subsequent release to containment.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

25. 007EA2.06 001

Given the following plant conditions:

- Reactor was at 100% power.
- A rod control system failure causes all shutdown rods to fall into the core.
- Power Range Indicators are at 6% and slowly decreasing (-0.1 DPM SUR).
- E-0, "Reactor Trip or Safety Injection" is implemented.
- Operators actuate both manual Rx trip handswitches.
- Both Rx trip breakers remain closed.

Which ONE of the following identifies the correct procedural response?

- a. Go to step 2 of E-0, "Reactor Trip or Safety Injection".
- b. Hold at step 1 of E-0 until Rx trip breakers are open locally.
- ✓c. Transition to and perform FR-S.1, "Nuclear Power Generation/ATWS", then transition back to E-0.
- d. Transition to FR-S.1, "Nuclear Power Generation/ATWS", and transition back to E-0 when control rods are fully inserted into the core.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

26. 007EK2.02 001

Given the following plant conditions:

- Unit 1 operating at 22% power.
- Reactor Trip Breakers "A" & "B" closed.
- Bypass Breaker B is racked in and closed.
- "B" Train SSPS Input Error Inhibit Switch is in INHIBIT for surveillance testing.

Which ONE of the following describes the response of the Reactor Trip and Bypass Breakers if RCS pressure drops below the Low Pressure Reactor trip setpoint with no operator action?

- a. Reactor Trip Breakers "A" & "B" open, Bypass Breaker "B" opens.
- b. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" remains closed.
- c. Reactor Trip Breaker "B" opens and "A" remains closed, Bypass Breaker "B" opens.
- ✓d. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" opens.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

27. 008AK1.01 001

Given the following plant conditions:

- Unit was at 100% power.
- All systems operating in automatic and all plant parameters at their normal values.
- 1-PCV-68-340 failed partially open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 45 psig?

- a. 228°F.
- b. 250°F.
- c. 275°F
- ✓d. 290°F

28. 027AA2.02 001

Given the following plant conditions:

- The plant is at steady state 100% power equilibrium xenon with all control systems in automatic.
- Pressurizer level control is transferred to MANUAL and level is slowly increased to 75% and maintained.

Which ONE of the following describes the PZR pressure response?

- a. Pressure is essentially unaffected.
- b. Pressure will continuously cycle between 2235 and 2260 psig.
- c. Pressure will increase until the spray valves open and control pressure at 2260 psig.
- ✓d. Pressure will increase until the spray valves open and slowly return pressure to steady state 2235 psig.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

29. 027AK3.02 001

Given the following plant conditions:

- The Unit is at 100% load.
- Pressurizer pressure channel selector switch, 1-XS-68-340D, is in the PT-68-340 & 334 position.
- Instrument Maintenance has 1-PT-68-323 (CH III) OOS for a loop calibration.
- PZR Pressure transmitter, 1-PT-68-334 (CH II) has just failed AS IS.
- The operating crew implements AOI-18, "Malfunction of Pressurizer Pressure Control System".

Which ONE of the following channels will be selected on 1-XS-68-340D and position of the master controller following completion of AOI-18, Malfunction of Pressurizer Pressure Control System?

- a. Channel I and III selected with 1-PIC-68-340A in AUTO.
- b. Channel I and III selected with 1-PIC-68-340A in MANUAL.
- ✓c. Channel I and IV selected with 1-PIC-68-340A in AUTO.
- d. Channel I and IV selected with 1-PIC-68-340A in MANUAL.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

30. 032AK3.02 001

Given the following plant conditions:

- The Unit is in MODE 6.
- Source Range Monitor (SRM) NI-132 has failed LOW resulting in a loss of the audio count rate signal.

WHICH ONE of the following describes the actions necessary to restore the audio count rate signal to the control room.

- ✓a. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N31 position.
- b. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N32 position.
- c. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A1 position.
- d. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A2 position.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

31. 033AA1.01 001

Given the following plant conditions:

- A Reactor startup in progress.
- Reactor power is stable at $2 \times 10^{-2}\%$ power on the Intermediate Range
- Intermediate Range channel N-135 was declared inoperable and removed from service per AOI-4, "Nuclear instrumentation Malfunction".

Which ONE of the following describes the plant response if an I&C Technician mistakenly removes the control power fuses for N-135 during troubleshooting activities?

- ✓a. The trip bistable deenergizes and a reactor trip occurs because power is below P-10.
- b. The trip bistable deenergizes, however NO trip occurs because N-135 is bypassed.
- c. The trip bistable energizes, however NO trip occurs because N-135 is bypassed.
- d. The trip bistable energizes and a reactor trip occurs because power is below P-10.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

32. 038EK1.01 001

Given the following plant conditions:

- Steam Generator Tube Rupture has occurred.
- Crew has implemented E-3, "Steam Generator Tube Rupture".
- The operators have completed cooldown to target incore temperature of 480°F.

Which ONE of the following identifies the pressure that steam dumps will be set to control RCS temperature at 480°F?

- a. 580 - 585 psig.
- ✓b. 550 - 555 psig.
- c. 580 - 585 psia.
- d. 550 - 555 psia.

33. 058AK3.01 001

Given the following plant conditions:

- AUO reports Emergency Diesel Generator (D/G) 1A-A has lost 125V DC control power from it's associated Diesel Battery Distribution Panel
- D/G 1A-A is NOT running.

Which ONE of the following describes how this loss of DC control power would affect D/G operation?

- a. D/G would start in response to an automatic or manual start signal.
- ✓b. D/G cannot be started by automatic or manual start signal.
- c. D/G can only be started manually from local control panel.
- d. D/G can only be started manually from the MCR panel.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

34. 060AA2.05 001

Given the following conditions:

- Unit at 100% power.
- The Control Room Air Intake radiation monitor, 1-RM-90-125, alarms.

Which ONE of the following describes the response of the Control Building Ventilation System?

- ✓a. Pressurization fans inlet dampers CLOSE
Emergency Pressurization fans inlet dampers OPEN
Air cleanup fans inlet dampers OPEN
- b. Pressurization fans inlet dampers OPEN
Emergency Pressurization fans inlet dampers CLOSE
Air cleanup fans inlet dampers OPEN
- c. Pressurization fans inlet dampers CLOSE
Emergency Pressurization fans inlet dampers OPEN
Air cleanup fans inlet dampers CLOSE
- d. Pressurization fans inlet dampers OPEN
Emergency Pressurization fans inlet dampers CLOSE
Air cleanup fans inlet dampers CLOSE

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

35. 060AA2.04 001

Given the following plant conditions:

- A Gas Decay Tank release in progress with ABGTS running for dilution air flow.
- A leak occurs on the waste gas compressor which results in a gas release to the Auxiliary Building.
- 0-RE-90-101, Auxiliary Building Vent Monitor, is in alarm.

Which ONE of the following indicates the effect this leak will have on the plant?

- a. Gas Decay Tank release will be terminated; ABGTS will be stopped.
- b. Gas Decay Tank release will be terminated; ABGTS will continue to run.
- c. Gas Decay Tank release will continue; ABGTS will be stopped.
- ✓d. Gas Decay Tank release will continue; ABGTS will continue to run.

36. 065AA1.04 001

Following an automatic start due to low instrument air pressure, which ONE of the following describes what will cause Aux Air Compressors to shutdown?

- ✓a. Running unloaded for 5 mins.
- b. Running unloaded for 10 mins.
- c. Low crankcase oil pressure.
- d. High discharge air temperature.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

37. E03EK1.3 001

Given the following plant conditions:

- A small break LOCA has occurred
- 1B-B CCP and SIP failed to start and could not be started manually.
- E-1 is completed and transition to ES-1.2, "Post LOCA Cooldown and Depressurization", made.
- 6.9kV Shutdown Board 1A-A is de-energized due to a fault
- The following conditions are noted by the OAC
 - RCS pressure is 1600 psig
 - Containment pressure is 6 psig

Which ONE of the following describes the action that should be taken and the basis for that action?

- a. All RCPs should be stopped to limit heat input during the RCS cooldown.
- ✓b. All RCPs should be stopped because Phase B isolation has occurred.
- c. All RCPs should NOT be stopped because no CCP or SIP is injecting into the RCS.
- d. All RCPs should NOT be stopped because the RCS pressure is above 1500 psig.

38. E03EK2.2 001

Which ONE of the following is the significance of draining the SG U-tubes and blowing the inverted "loop seal" during a cold leg small break LOCA?

- ✓a. A steam vent path is established from the core to the break location and mass loss from the system is decreased.
- b. Core cooling will be lost after the loop seal is blown due to increased injection flow being diverted to the break location.
- c. RCS pressure control will be lost resulting in a challenge to Pressurized Thermal Shock limits.
- d. The heat sink effect of the water in the "crossover" leg is lost when the loop seal is lost resulting in a degraded core cooling.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

39. E05EK2.1 001

Given the following plant conditions:

- Reactor trip and safety injection occurred.
- The crew implemented FR-H.1, "Loss of Secondary Heat Sink" due to heat sink red path.
- Operators are preparing for main feedwater startup.

Which ONE of the following lists the minimum actions required to reset Main Feedwater Pump 1A?

- a. Reset safety injection and cycle reactor trip breakers.
- b. Reset safety injection and reset feedwater isolation signal.
- c. Cycle the reactor trip breakers and reset feedwater isolation signal.
- ✓d. Reset safety injection, cycle reactor trip breakers, and reset feedwater isolation signal.

40. E11EA1.2 001

Given the following plant conditions:

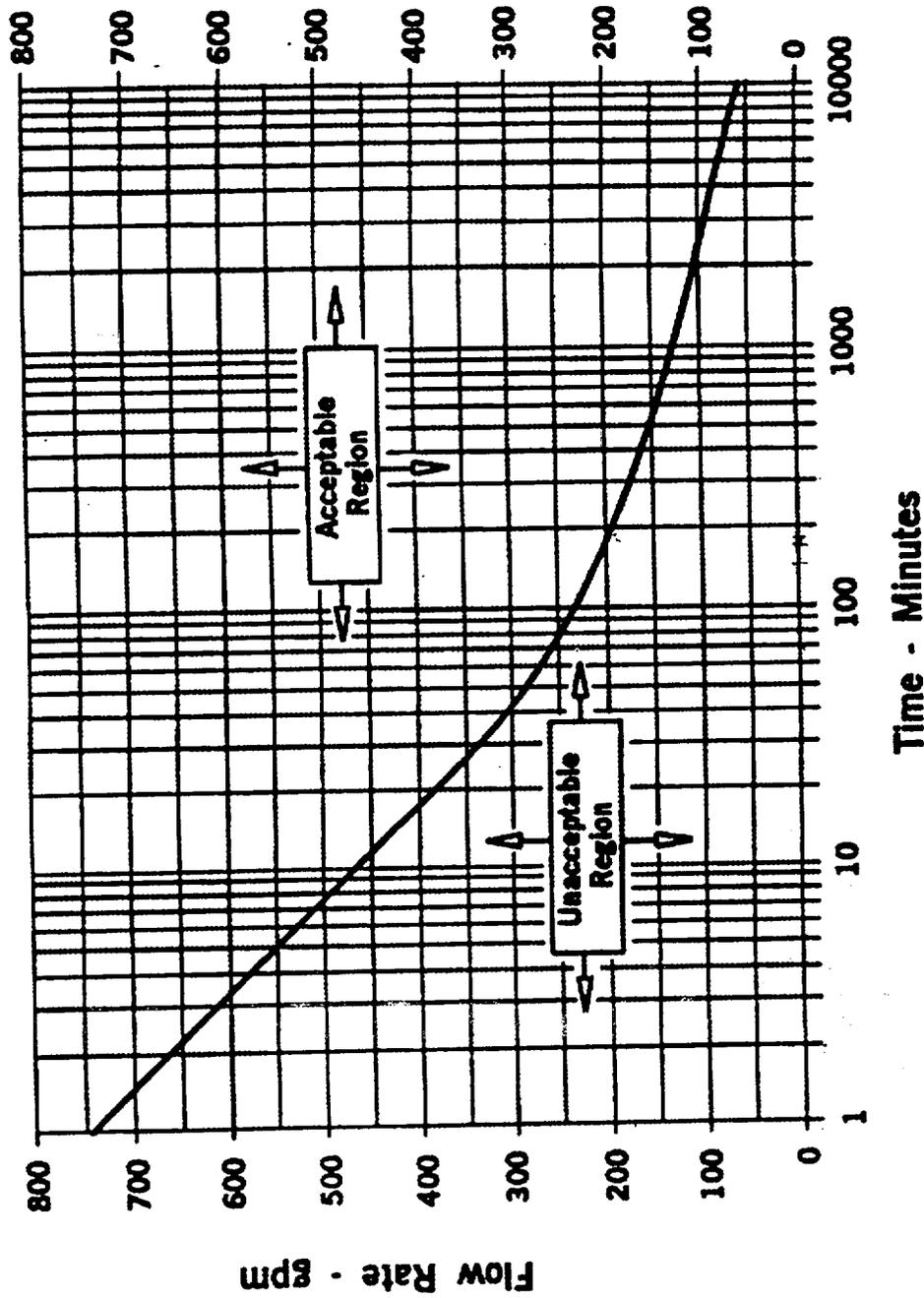
- Reactor trip and SI occurred at 0200 due to a small LOCA.
- At 0300 the crew transitioned to ECA-1.1, "Loss of RHR Sump Recirculation", due to the failure of both RHR pumps.
- Crew has reduced ECCS flow to 1 SIP and 1 CCP per ECA-1.1.
- At 0500 the crew is performing step 17 RNO to establish the minimum required ECCS flow to remove decay heat.

Using Figure 1 from ECA-1.1, which ONE of the following flow rates would satisfy the intent of the RNO?

- a. 180 gpm
- ✓b. 210 gpm
- c. 240 gpm
- d. 280 gpm

Minimum SI Flow for Decay Heat vs. Time After Trip

FIGURE 1



ECA111

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

41. 028G2.2.9 001

Given the following plant conditions:

- The Unit is at 100% power.
- PZR level channel 1-LT-68-335 has failed HIGH
- Operating crew has addressed the failure per AOI-20, Malfunction of Pressurizer Level Control

In response to the failure, which ONE of the following will most likely require a safety evaluation?

- a. A non-intent procedure change to AOI-20 is submitted to clarify a step.
- ✓b. A special test is performed on PZR level channel 1-LT-68-335 to determine automatic actions.
- c. A surveillance is required to be performed on channel 1-LT-68-339 while 1-LT-68-335 is out of service.
- d. Post maintenance test is required to be performed on 1-LT-68-335 prior to returning channel to service.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

42. 036AA2.01 001

Given the following plant conditions:

- Plant is in Mode 6 with core offload in progress.
- The fuel assembly being withdrawn into the refueling mast is dropped onto the lower core plate.
- The refuel crew observes bubbles coming from the dropped fuel assembly.

Which ONE of the following identifies the most likely indications/actions as a result of this incident?

- ✓a. Upper Containment area radiation monitor, 1-RM-90-59, alarms only.
- b. Spent Fuel Pit area radiation monitor, 1-RM-90-102, alarms only.
- c. Shield Bldg vent monitor, 1-RM-90-400, initiates Containment Vent Isolation.
- d. Spent Fuel Pit area radiation monitor, 1-RM-90-1, initiates Auxiliary Bldg Isolation.

43. 036AK1.03 001

Which ONE of the following describes why the baseline count rate used for developing the 1/M plot must be re-calculated following movement of any source bearing fuel assembly ?

- a. Re-verify the operability of the source range instruments.
- ✓b. Ensures an accurate 1/M plot to monitor subcriticality.
- c. Determine adequate shutdown margin during refueling.
- d. Readjust the setpoint for the High Flux at Shutdown alarm.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

44. 001K5.28 001

Given the following plant conditions:

- The Unit is at 1% power after an extended shutdown.
- Core burnup is 2000 MWD/MTU.
- RCS boron concentration is 1000 ppm.
- Control rods at 175 steps
- The STA has determined that 236 pcm of reactivity must be added to increase power to 10%.

Using the attached NUPOP curve and assuming no control rod movement, which ONE of the following identifies the final boron concentration of the RCS after the reactivity change has been made?

- a. 966 ppm
- b. 969 ppm
- c. 1031 ppm
- d. 1034 ppm

45. 001K6.02 001

Unit is operating at 100% power with all systems in their normal configuration, when Auctioneered High Tavg fails LOW.

Which ONE of the following describes the plant response?

- a. Control rods will step in; Charging Flow Control valve, 1-FCV-62-93, opens.
- b. Control rods will step out; Charging Flow Control valve, 1-FCV-62-93, closes.
- c. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, opens.
- d. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, closes.

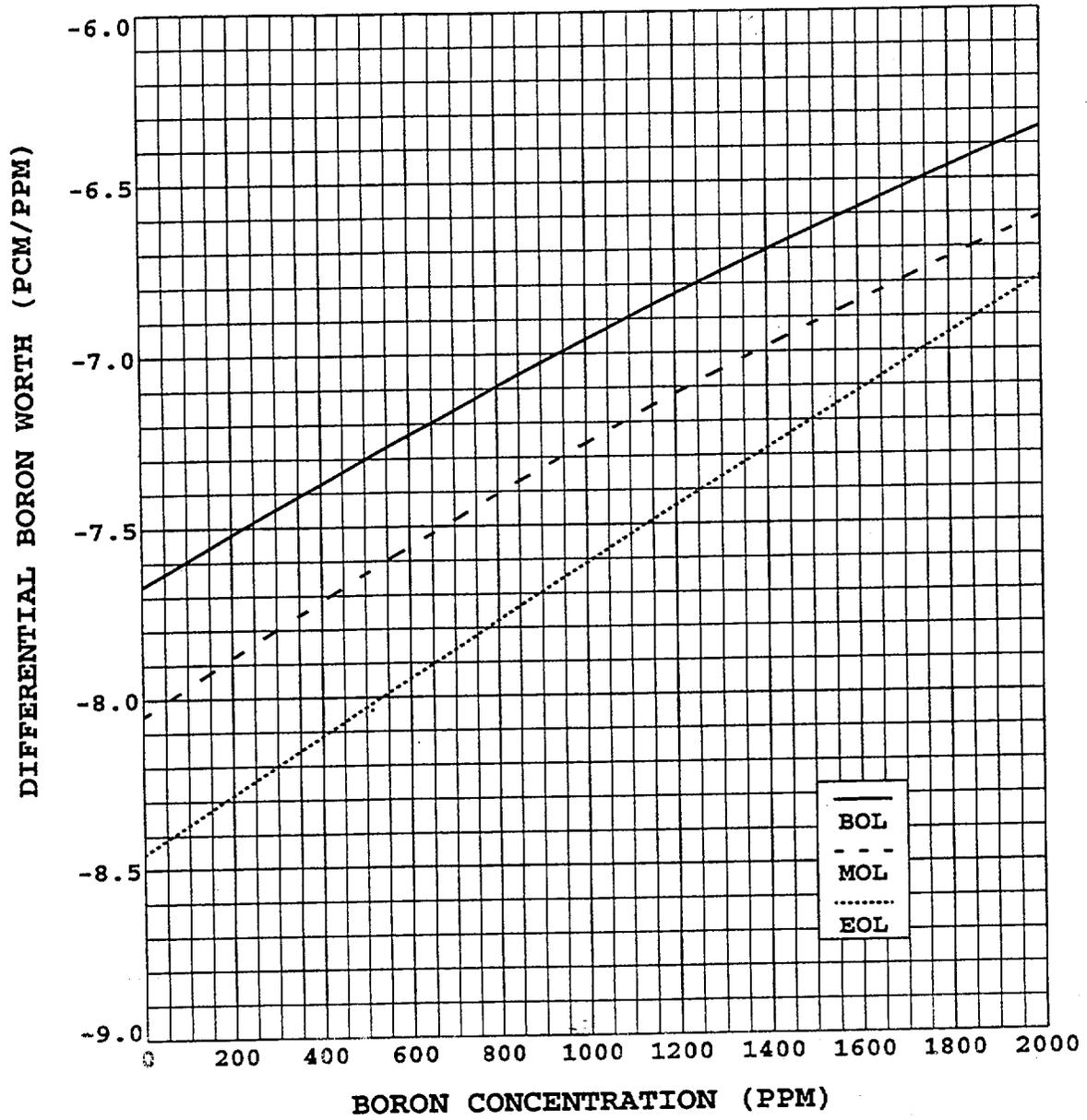


Figure 6-22 Differential Boron Worth Versus Boron Concentration at BOL, MOL, and EOL, HZP, With No Xenon

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

46. 003G2.4.48 001

Given the following plant conditions:

- Unit is operating at 20% power with a startup in progress.
- A problem develops which requires removal of Loop 1 RCP
- At 1101, using ICS, you determine the following conditions exist:
 - Motor Bearing Temperature is 180°F and increasing at 1°F/min.
 - Motor Winding Temperature is 315°F and stable.
 - Pump Bearing Temperature is 220°F and increasing at 1°F/min.

Which ONE of the following correctly describes when loop 1 RCP must be removed from service and the effects on loop 1 steam flow when the RCP is stopped?

- ✓a. 1101; RCS loop 1 hot leg temperature decreases; Steam flow decreases.
- b. 1101; RCS loop 1 hot leg temperature increases; Steam flow decreases.
- c. 1106; RCS loop 1 hot leg temperature decreases; Steam flow increases.
- d. 1106; RCS loop 1 hot leg temperature increases; Steam flow increases.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

47. 003A1.08 001

Given the following plant conditions:

- The Unit is operating at 100% power.
- All systems are operating normal.
- Annunciator "RCP #1 Seal Outlet Temp Hi" alarm actuates.
- The operator verifies that ALL RCP seal temperatures are 180°F rising.

Which ONE of the following is the most probable cause of this alarm?

- a. The Charging Pump suction has swapped to the RWST.
- b. The operator has just placed Excess Letdown in service at maximum flow rate.
- ✓c. The Letdown Heat Exchanger temperature control valve 1-TCV-70-192 has failed closed.
- d. A loss of control air to charging flow control valve 1-FCV-62-93.

48. 004K3.01 001

Given the following conditions:

- Reactor power 35%.
- Turbine load 32%
- Control Rods are in AUTOMATIC.
- CVCS Mixed Bed A was placed in service resulting in a T-avg increase to 571°F.

Which ONE of the following describes the response of the rod control system?
(assume no operator action)

- a. Rods will step in at 8 steps per minute.
- ✓b. Rods will step in at 40 steps per minute.
- c. Rods will step in at 64 steps per minute.
- d. Rods will step in at 72 steps per minute.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

49. 004K2.03 001

Given the following plant conditions:

- The unit is at 100% power with 1A-A CCP is in operation.
- A loss of offsite power occurs
- All appropriate loads sequence onto the Shutdown Boards
- The crew has implemented E-0, "Reactor Trip or Safety Injection"
- While the immediate actions are being completed, a safety injection signal (SI) is received.

Which ONE of the following describes the response of the Centrifugal Charging Pumps (CCPs)?

- a. 1A-A CCP load sheds on the SI signal, and both CCPs auto sequence on the shutdown boards.
- b. 1A-A CCP load sheds on the SI signal, and must be restarted manually by the operator.
- c. 1A-A CCP does not load shed on the SI signal, and 1B-B CCP auto sequences on the shutdown boards.
- ✓d. Both CCPs remain energized and running following the SI signal.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

50. 013K2.01 001

Given the following:

- 1A-A and 1B-B SI Pump breakers are "Racked In".
- A fuse blows in the NORMAL DC Trip circuit for the 1A-A SI pump.
- A safety injection (SI) actuation occurs.

Which ONE of the following describes the response of the SI Pumps to the SI signal?

- a. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start until the control power supply is transferred.
- b. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start and must be started from the MCR handswitch.
- ✓c. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped from the MCR.
- d. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped mechanically at the breaker.

51. 013K4.08 001

Which ONE of the following describes the logic for Safety Injection (SI) actuation handswitches and reset pushbuttons?

- a. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets both trains of SI.
- ✓b. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets only it's associated train of SI.
- c. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets only it's associated train of SI.
- d. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets both trains of SI.

**WATT'S BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

52. 015A2.03 001

Given the following plant conditions:

- Unit is operating at 75% power
- A plant transient has resulted in a xenon oscillation
- Control rods are currently at 216 steps on D bank

Which ONE of the following is the effect of the xenon oscillation on NIS and the action required to dampen the oscillation?

- ✓a. The oscillation affects AFD and is dampened by inserting control rods at its most positive peak.
- b. The oscillation affects AFD and is dampened by inserting control rods at its most negative peak.
- c. The oscillation affects QPTR and is dampened by dropping turbine load at its highest value.
- d. The oscillation affects QPTR and is dampened by dropping turbine load at its lowest value.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

53. 017A3.01 001

Given the following plant conditions:

- A small break LOCA has occurred.
- The crew responded IAW EOPs and tripped the RCPs when required.
- The crew is currently in ES-1.2, "Post LOCA Cooldown And Depressurization".
- RCS pressure is 1490 psig.
- Wide range Tc's are 505°F and decreasing slowly.
- Wide range Th's are 515°F and decreasing slowly.
- Core exit thermocouples (CETC) are 551°F and stable.
- Containment pressure is 1.5 psig.
- SG levels are being maintained at 38%.
- SG pressures are 715 psig and decreasing slowly.

Which ONE of the following describes the status of natural circulation for the existing plant conditions?

- ✓a. Cannot be assured, since there is inadequate sub-cooling.
- b. Cannot be assured, since SG parameters are not satisfied.
- c. Cannot be assured, since CETCs are not decreasing.
- d. Exists since all natural circulation criteria are met.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

54. 022K4.03 001

Given the following plant conditions:

- Reactor trip & Safety Injection occurred due to Large Break LOCA.
- Containment ØB isolation has occurred.
- All systems responded normally.

Which ONE of the following describes the response of the Lower Compartment Coolers when ØB is reset?

- a. Fans in A-P-AUTO start.
Cooler ERCW isolation valves open.
- ✓b. Fans in A-P-AUTO start.
Cooler ERCW isolation valves remain closed.
- c. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves open.
- d. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves remain closed.

55. 022A4.02 001

Given the following plant conditions:

- Main Steam Line Break occurred inside containment causing a reactor trip and safety injection.
- Operators have implemented the EOPs.
- Containment pressure is 3.2 psig and dropping.
- OAC observes the "INSTR ROOM COOLER A/B FLOW LOW" alarm LIT.

Which ONE of the following ESFAS signals caused the Incore Instrument Room Cooling fans, circ pump, and chiller to shut down?

- a. Containment vent isolation (CVI).
- ✓b. ØA containment isolation.
- c. ØB containment isolation.
- d. Aux. Building Isolation (ABI)

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

56. 025A3.02 001

Given the following plant conditions:

- Large break LOCA has occurred causing a reactor trip and safety injection.
- OAC observes annunciator "Glycol Exp Tank Level Hi/Hi-Hi is LIT.

Which ONE of the following describes the most likely reason the annunciator is LIT?

- a. ØA closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- ✓b. ØA closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.
- c. ØB closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- d. ØB closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

57. 026A2.09 001

Given the following plant conditions:

- Large break LOCA has occurred.
- Swapover to containment sump was unsuccessful and crew has implemented ECA-1.1, "Loss of RHR Sump Recirculation".
- Containment Spray has been aligned to the containment sump.
- Unit Supervisor has directed the OAC to initiate makeup to the RWST.

Which ONE of the following lists the preferred makeup source to the RWST?

- a. Transfer water from the Holdup Tank.
- b. Transfer water from the Spent Fuel Pit.
- ✓c. Align Containment Spray to the RWST.
- d. Align CVCS blender to makeup.

58. 059K3.04 001

Given the following conditions:

- Unit is operating at 100% power.
- FCV-2-35, Condensate Short Cycle valve fails OPEN

Which ONE of the following describes the effect on reactor power and the correct operator response?

Reactor power will:

- a. Increase; Borate the RCS.
- ✓b. Increase; Reduce turbine load.
- c. Decrease; Dilute the RCS.
- d. Decrease; Raise turbine load.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

59. 061K5.02 001

Which ONE of the following describes the decay heat sources and design basis for the Auxiliary Feedwater (AFW) System during a loss of offsite power?

- a. Prevents relief through the PZR safety valves by removing core decay heat only.
- b. Prevents relief through the S/G safety valves by removing core decay heat only.
- ✓c. Prevents relief through the PZR safety valves by removing core decay heat and stored RCS heat .
- d. Prevents relief through the S/G safety valves by removing core decay heat and RCP heat.

60. 063K2.01 001

Given the following plant conditions:

- Reactor tripped on lo-lo SG level.
- All MSIVs are closed.
- All feedwater reg and bypass reg valves are closed.
- Turbine Driven AFW pump is the ONLY AFW pump running.
- All DGs are running unloaded.

Which ONE of the following correctly lists the 125V DC Vital Battery Board(s) that is/are deenergized?

- a. Only Board I.
- b. Only Board III.
- ✓c. Board I and II.
- d. Board I and III.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

61. 071A1.06 001

Given the following plant conditions:

- Unit is at 100% power.
- "A" Waste Gas Compressor is in service.
- Pressure in the "in service" Waste Gas Decay Tank (WGDT) is 60 psig.
- No WGDT release is in progress
- The relief valve on the "in service" WGDT begins to experience seat leakage.

Which ONE of the following will provide the best indication that the relief valve on the WGDT is leaking?

- a. Increasing count rates on RM-90-101A, Auxiliary Building Vent Monitor.
- ✓b. Increasing count rates on RM-90-400, Shield Building Vent Monitor.
- c. FCV 77-119, Plant Vent Flow Control valve, isolates due to high radiation.
- d. The Waste Gas Vent Header pressure increases causing the Waste Gas Compressor to run continuously.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

62. 072K1.02 001

Given the following plant conditions:

- A source check is being performed on Spent Fuel Pool Monitor (RE-90-102).
- Auto Block handswitches are in the OFF position.

Which ONE of the following will occur when the control switch is placed in "SOURCE CHECK"?

- a. The fuel handling area ventilation system is diverted to the suction of the EGTS system.
- b. The green light on the monitor goes out indicating that the monitor is being source checked.
- ✓c. Auxiliary Building Ventilation isolates, but no Auxiliary Building isolation signal is generated.
- d. A Containment Ventilation Isolation signal is generated.

63. 002K1.02 001

Given the following plant conditions:

- The reactor is at 100% power
- Rod control is in automatic.
- Power Range nuclear instrument N-42 fails HIGH.

Which ONE of the following describes the rod control and plant response?

- a. Rods move in until the power mismatch rate signal decays, then move out to the original position to correct the temperature error.
- ✓b. Rods move in until the power mismatch rate signal decays, then remain at the new position with a reduced T-avg.
- c. Rods move out until the power mismatch rate signal decays, then move in to the original position to correct the temperature error.
- d. Rods move out until the high power rod block is reached, then remain at the new position with a higher T-avg.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

64. 002K4.05 001

Given the following plant conditions:

- Unit was at 100% power.
- A spurious Safety Injection occurs.
- Operators are responding per the EOP network and have just transitioned to ES-1.1, "SI Termination".
- Annunciators "PRT LEVEL HI/LO, PRESS HI, and TEMP HI" alarm.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

- a. Pressurizer PORVs, 1-PCV-68-340 and 334, have lifted.
- b. CVCS Letdown Header Relief valve, 1-RLF-62-662 has lifted.
- c. RHR Pump Discharge Relief valve, 1-RLF-63-620, has lifted.
- ✓d. RCP #1 Seal Leakoff Relief Valve, 1-RLF-62-636, has lifted.

65. 010K6.04 001

Given the following plant conditions:

- Operating at 100% power.
- PZR PORV, PCV 68-340, is leaking through.
- PRT pressure increases resulting in rupture of the PRT diaphragm.

What effect will the rupture of the PRT diaphragm have on PRT temperature and leakage through the PORV?

	<u>PRT Temp</u>	<u>PORV Leakage</u>
a.	Rises	Rises
b.	Rises	Drops
✓c.	Drops	Rises
d.	Drops	Drops

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

66. 010A3.01 001

Given the following plant conditions:

- Unit is operating at 100% power.
- PZR PORV testing is in progress
- While Operators are raising PRT level to reduce PRT Oxygen content the PRT PRESS HI alarm annunciates.

Which ONE of the following automatic actions will occur?

- ✓a. The WDS vent header control valve PCV-68-301 will CLOSE.
- b. The primary water supply valve, FCV-68-303 will CLOSE.
- c. The PRT drain valve to RCDT FCV-68-310 will OPEN.
- d. The PRT nitrogen supply isolation valve FCV-68-305 will CLOSE.

67. 011G2.4.45 001

Given the following plant conditions:

- Unit is operating at 100% power.
- Controlling PZR level transmitter, 1-LT-68-339 failed LOW.
- The OAC observes annunciator, "PZR LEVEL HI/LO", LIT with PZR level at 72% and slowly rising.

Which ONE of the following lists the status of PZR heaters and charging after the failure? (assume NO operator action)

- a. All back-up heaters energized; charging flow at minimum of 0 gpm.
- b. All back-up heaters energized; charging flow at minimum of 35 gpm.
- c. All back-up heaters deenergized; charging flow at minimum of 0 gpm.
- ✓d. All back-up heaters deenergized; charging flow at minimum of 35 gpm.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

68. 012K5.02 001

Which ONE of the following would result in the OP Δ T reactor protection trip setpoint being reduced? Consider each parameter independently.

- a. ΔT increasing.
- ✓b. Tavg increasing.
- c. PRZ pressure decreasing.
- d. Reactor Power decreasing.

69. 012A2.04 001

Given the following plant conditions:

- The operating crew is responding to a reactor trip due to a loss of 120V AC Vital Instrument Power Bd I.
- PZR pressure transmitter 68-334 (Channel II) failed LOW.

Which ONE of the following describes the plant response?

- a. Both trains of SSPS SI master relays would actuate AND both trains of ECCS equipment auto start.
- ✓b. Both trains of SSPS SI master relays would actuate BUT only "B" train ECCS equipment auto start.
- c. Only the "B" train SSPS SI master relays would actuate BUT both trains of ECCS equipment auto start.
- d. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment auto start.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

70. 027K2.01 001

Given the following plant conditions

- Unit is at 100% power.
- 1A-A 6.9 KV Shutdown Board is out of service for maintenance.
- A reactor trip and safety injection (SI) is initiated due to a large break LOCA.
- Automatic and manual "B" train Safety Injection fails to actuate.

With no further operator action, which ONE of the following describes the status of the Emergency Gas Treatment System (EGTS)?

- a. Both trains are running
- b. Only "A" train is running
- c. Only "B" train is running
- ✓d. Neither train is running

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

71. 028K6.01 001

Given the following plant conditions:

- A large break LOCA occurs from 100% power.
- "B" Hydrogen recombiner is tagged out.
- "A" Hydrogen Recombiner has been placed in service.
- Subsequently the "A" Hydrogen Recombiner trips on overcurrent.

Which ONE of the following indicates how the concentration of hydrogen will be controlled inside containment if the "A" Hydrogen Recombiner trips?

- a. Containment Purge Supply and Exhaust fans are placed in service to dilute the hydrogen concentration in containment.
- b. A continuous vent path is provided that allows hydrogen to vent to the annulus and then be removed by EGTS.
- ✓c. Air Return Fans create a mixing effect and the hydrogen igniters will burn hydrogen to maintain it below an explosive concentration.
- d. Emergency Gas Treatment System will remove hydrogen which collects in the containment dome and discharge to the shield building vent.

72. 034K4.01 001

Which ONE of the following describes a feature of the Refueling Machine designed to prevent the accidental release of a fuel assembly?

- a. Gripper is mechanically engaged and disengaged by remote operating handle on bridge and requires no power or air to operate.
- ✓b. Gripper requires air to disengage, however a mechanical latch prevents gripper release under load even if air is applied.
- c. Gripper disengages upon loss of air, however a mechanical latch prevents gripper release under load even if air is removed.
- d. When gripper is engaged, operators mechanically lock gripper in place with extension shaft which must be unlocked before gripper can release.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

73. 034A1.02 001

Given the following plant conditions:

- Core load is in progress.
- A failure of the Reactor Cavity Seal occurred.
- Cavity level is currently el. 748' and dropping slowly.

Which ONE of the following actions is required per AOI-29, "Dropped or Damaged Fuel or Refueling Cavity Seal Failure"?

- a. Align RHR suction to the RWST and discharge to the RCS through the hot legs.
- ✓b. Align CCP suction to RWST and discharge to the RCS through normal charging.
- c. Start one SI pump in the cold leg injection flowpath for cavity makeup.
- d. Align Refueling Water Purification pumps suction to RWST and discharge directly to refueling cavity.

74. 039A1.03 001

Given the following plant conditions:

- Startup in progress.
- Operators are warming the main steam lines using the MSIV bypasses.
- The OAC observes that the RCS has cooled down 108°F in the past hour.
- The CRO observes that the main steam lines have heated up 102°F in the past hour.

Which ONE of the following indicates the actions that should be taken by the operators and why?

- ✓a. Close the MSIV bypass valves; RCS cooldown limit was exceeded.
- b. Close the MSIV bypass valves; main steam line heat-up limit was exceeded.
- c. Close the MSIV bypass valves; both RCS and main steam line limits were exceeded.
- d. Leave MSIV bypass valves open; NO RCS or main steam line limits were exceeded.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

75. 039A3.02 001

Given the following plant conditions:

- Reactor coolant system pressure has decreased to 1930 psig during a plant cooldown.
- The operator has placed the Low Steam Line Pressure Block switches HS-63-135 A & B to BLOCK.

Which ONE of the following describes the status of the Safety Injection and Main Steam Line isolation signals?

- a. Only the low steamline pressure MSIV isolation is blocked; low steamline pressure SI is operational.
- b. Only the low steamline pressure SI signal is blocked; low steam line pressure MSIV isolation is operational.
- c. Both the high steamline pressure negative rate MSIV isolation and high steamline pressure negative rate SI signal are operational.
- ✓d. Both the low steam line pressure MSIV isolation and low steam line pressure SI signal are blocked.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

76. 064G2.2.18 001

Given the following plant conditions:

- Plant is in Mode 5.
- "A" train RHR is in operation controlling RCS temperature at 120°F.
- RCS level is at elevation 718'10"
- MEG requests that Emergency Diesel Generator (D/G) 1A-A be tagged out to replace the voltage regulator with a new model.

Which ONE of the following describes how this request should be handled?

- ✓a. D/G 1A-A may NOT be removed from service at this time to protect RHR train "A".
- b. D/G 1A-A may NOT be removed from service at this time since both the 1A-A and 1B-B D/G are required to be operable by Tech Specs.
- c. D/G 1A-A may be removed from service at this time as long as one offsite circuit is operable.
- d. D/G 1A-A may be removed from service at this time as long as risk guidance was obtained from the PSA engineering group.

77. 073K1.01 001

Given the following plant conditions:

- Unit is at 100% power
- High radiation alarms are in on Steam Generator Blowdown (SGBD) radiation monitors 1-RM-90-120 and 121.

Which ONE of the following describes the SGBD System response?

- a. The SGBD Containment isolation valves, FCV-15-181 through 184, close.
- ✓b. The SGBD Cooling Tower blowdown isolation valve, FCV-15-44, closes.
- c. The SGBD to Condensate Header isolation Valve, FCV-15-6, closes.
- d. The SGBD flow control valve, FCV-15-43, closes.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

78. 075K3.07 001

Given the following conditions:

- A loss of offsite power has occurred.
- Tavg is 557°F.
- Steam Dump controls are in the Steam Pressure mode.
- Steam dump demand is manually increased to begin cooldown.
- Steam Dump valves will NOT open.

Which ONE of the following explains why the Steam Dump valves will NOT open?

- a. P-4, Reactor Trip, has not been actuated.
- ✓b. C-9, Condenser Available, interlock is not met.
- c. P-12, Lo-Lo Tavg, has disarmed the Steam Dump system.
- d. C-7, Load Rejection controller, has not been actuated.

79. 075A4.01 001

Given the following plant conditions:

- Reactor trip and safety injection occurred while the plant was operating at 100% power.
- Four ERCW pumps were running in their normal alignment before the SI occurred.

Which ONE of the following identifies ERCW pump status after the SI and the effect it has on the Condenser Circulating Water (CCW) system make-up?

- a. Four ERCW pumps running; CCW make-up is provided only from ERCW since RCW bypass strainer is isolated.
- b. Eight ERCW pumps running; CCW make-up is provided only from RCW since ERCW is routed through the overflow structure.
- ✓c. Four ERCW pumps running; CCW make-up provided from both RCW and ERCW.
- d. Eight ERCW pumps running; CCW make-up is not required since the unit is tripped.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

80. 005K4.07 001

Given the following plant conditions:

- Unit was operating at 100% power.
- A large break LOCA resulted in a reactor trip and safety injection.
- Alignment to Cold Leg Recirculation is in progress.
- 1-FCV-63-8, 1A-A RHR Pump to CCP suction, will NOT open from the Control Room.

Assuming all other equipment functions as expected, which ONE of the following would prevent the valve from opening?

- a. SI pump minimum flow valve 1-FCV-63-175 open.
- b. RHR pump suction from RWST 1-FCV-63-1 open.
- ✓c. Containment sump suction valve 1-FCV-63-72 closed.
- d. The A train safety injection signal has been reset.

81. 041G2.4.21 001

A reactor trip and turbine trip occurs while at 25% power.

Which ONE of the following describes the response of the Steam Dump system?

- a. Load rejection arms Steam Dump valves;
Tavg will be reduced to no-load Tavg.
- b. Load rejection arms Steam Dump valves;
Tavg will be reduced to within 5°F of Tref.
- ✓c. Reactor trip arms Steam Dump valves;
Tavg will be reduced to no-load Tavg.
- d. Reactor trip arms Steam Dump valves;
Tavg will be reduced to within 5°F of Tref.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

82. 045A1.05 001

Given the following plant conditions:

- Unit 1 at 20% RTP
- Turbine trip occurs without a Reactor trip.

- The Steam Dump System is in T-avg Mode.
- Rod Control is in Automatic

Which ONE of the following describes the effect of the Turbine trip on the Steam Dump and the Rod Control Systems? Assume no operator actions.

- ✓a. The Steam Dump System will maintain T-avg at 562° F with all Control Rods fully inserted.

- b. The Steam Dump System will maintain T-avg at 557° F with all Control Rods fully inserted.

- c. The Steam Dump System will maintain T-avg at 562° F with Control Rods maintaining ≈15% Reactor power due to C-5.

- d. The Steam Dump System will maintain T-avg at 557° F with Control Rods maintaining ≈15% Reactor power due to C-5.

83. 078K1.05 001

Which ONE of the following describes the source of instrument air and the effect of a loss of instrument air on the Main Steam Isolation Valves (MSIVs)?

- ✓a. Non-essential air; MSIVs fail CLOSED.

- b. Non-essential air; MSIVs fail OPEN.

- c. Essential air; MSIVs fail CLOSED.

- d. Essential air; MSIVs fail OPEN.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

84. G2.1.6 001

Given the following plant conditions:

- A large break LOCA has occurred.
- The operating crew has entered the EOPs and is currently implementing E-0, "Reactor Trip or Safety Injection".

Which ONE of the following describes when a crew brief should be held?

- a. After step 4 of E-0 is complete.
- b. After step 11 of E-0 is complete.
- ✓c. Upon transitioning from E-0.
- d. Upon making the Emergency Classification

85. G2.1.7 001

Given the following plant conditions:

- Unit at 100% RTP
- A S/G #1 safety valve begins leaking and power increases to 105% RTP.
- The crew enters AOI-38 and reduces turbine load to 90% with the valve position limiter.
- This load reduction caused reactor power to decrease to 95% RTP.

Which ONE of the following would be the correct crew response per AOI-38 if the flow increased through the leaking safety valve causing the reactor power to return to 101%?

- a. Decrease turbine load at 5%/min to reduce reactor power to <100% and continue AOI-38.
- b. Use the valve position limiter to maintain power <100% and continue AOI-38.
- ✓c. Trip the reactor, close the MSIVs and bypasses, and go to E-0.
- d. Trip the reactor, initiate SI, close the MSIVs and bypasses and go to E-0.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

86. G2.1.11 001

Given the following conditions:

- Plant was operating at 100% power when a Main Feedwater pump tripped causing a plant runback.
- The OAC observes AFD to be outside the "doghouse" on PRM channels N41, and N44.

Which ONE of the following identifies the action required to comply with Technical Specifications?

- a. Restore AFD to within limits AND Reduce power to < 50% within 30 minutes.
- b. Restore AFD to within limits AND Reduce power to < 50% within 15 minutes.
- ✓c. Restore AFD to within limits OR Reduce power to < 50% within 30 minutes.
- d. Restore AFD to within limits OR Reduce power to < 50% within 15 minutes.

87. G2.1.12 001

Given the following conditions:

- Plant is at 100% power.
- RCS pressure is 2235 psig and T-avg is 588°F.
- RHR discharge relief valve 1-63-637 is leaking to the PRT at a rate of 2.5 gpm.

Which ONE of the following describes the type of leakage and the action required by Technical Specifications? (Assume all other systems are operating normally and no other RCS leakage)

- a. Unidentified leakage that requires shutdown.
- b. Pressure boundary leakage that requires shutdown.
- ✓c. Identified leakage, but does not require shutdown.
- d. Controlled leakage, but does not require shutdown.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

88. G2.1.33 001

Given the following plant conditions:

- Plant is in Mode 3
- During performance of Control Building routine rounds the AUO discovers the 125V DC supply breaker to 120V AC Vital Inverter 1-II in the TRIPPED position.

Which ONE of the following describes the correct action which must be taken with regard to Tech Specs?

- a. Attempt to close the supply breaker one time, if the breaker can be closed, Tech Spec LCO action entry is NOT required.
- ✓b. The Tech Spec LCO action for the inverter must be entered until the breaker can be closed.
- c. If the inverter is aligned to it's AC supply and the voltage is normal, Tech Spec LCO action entry is NOT required.
- d. If the inverter is aligned to it's AC supply and the voltage is normal, enter the appropriate Tech Spec LCO action for the inverter for tracking only until the breaker can be closed.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

89. G2.2.20 001

Given the following plant conditions:

- Plant is in Mode 3 with startup in progress.
- The breaker for "C" hotwell pump will not close.
- The Shift Manager and Work Week Manager determined that trouble shooting could be conducted as "minor work" if the pump is tagged out.

Which ONE of the following describes how this trouble shooting activity should be documented?

- a. WO is NOT required since only trouble shooting is planned and will have no operational impact, no detailed planning or documentation is required.
- b. WO is NOT required since a PER will be written to address the condition adverse to quality and trouble shooting may be documented in the PER.
- ✓c. WO is required, the WO may be sent directly to the craft after OPS approval and the work may be documented on the WO form.
- d. WO is required, the WO must be routed to planning after OPS approval and the work will be conducted and documented in the work package developed by the planner.

90. G2.2.22 001

Given the following plant conditions:

- Unit is in Mode 3 with cooldown to Cold Shutdown in progress.
- A transient occurred resulted in the pressurizer going solid and RCS pressure increasing to 2835 psig.

Which ONE of the following actions is required?

- a. Be in hot shutdown with RCS pressure within its limit in 1 hour.
- b. Be in hot shutdown with RCS pressure within its limit in 30 minutes.
- c. Reduce RCS pressure to within its limit within 15 minutes.
- ✓d. Reduce RCS pressure to within its limit within 5 minutes.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

91. G2.2.24 001

Given the following plant conditions:

- Unit is operating at 100% power.
- Pressure channel II, 1-PT-68-335, has failed HIGH.
- All required actions for this instrument failure have been completed.
- The surveillance for Pressurizer pressure channel IV, 1-PT-68-322, will become late at the end of this shift.

Which ONE of the following actions should be taken?

- a. Apply Tech Spec SR 3.0.3 to extend the surveillance for 24 hours to allow completion of maintenance on 1-PT-68-335.
- b. Bypass the bistables on 1-PT-68-322, enter LCO 3.0.3 and then perform surveillance on 1-PT-68-322.
- ✓c. Bypass the bistables on 1-PT-68-335 and then allow surveillance to be performed on 1-PT-68-322.
- d. Do not allow surveillance to be performed and enter Tech Spec 3.0.3 when the surveillance period expires.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

92. G2.2.28 001

Given the following plant conditions:

- Unit is in Mode 6.
- Refueling operations are in progress.
- An irradiated fuel assembly cannot be placed in its specified core location.

Which ONE of the following describes an approved location for the fuel assembly per FHI-7, Fuel Handling and Movement?

- a. Fuel assembly can be placed in the New Fuel Elevator, but the elevator must be full down with power removed.
- b. Fuel assembly may be placed in a free-standing core location as long as no other fuel assembly is free-standing.
- c. Fuel assembly must be returned to the SFP until an alternate core location is determined.
- ✓d. Fuel assembly may be temporarily stored in the RCCA change fixture.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

93. G2.3.1 001

The following conditions are encountered after a survey of a pump room in the Auxiliary building:

- | | |
|--|---|
| - General area radiation level in the room | 70 mrem/hr |
| - Radiation level 30 cm from the pump casing | 350 mrem/hr |
| - Contamination levels | 800 dpm/100cm ² beta
0 dpm/100cm ² alpha |

Which ONE of the following identifies the correct radiological postings required to reflect current radiological conditions for this room?

- a. Radiation Area.
- ✓ b. High Radiation Area.
- c. Radiation Area; Contamination Area.
- d. High Radiation Area; Contamination Area.

94. G2.3.4 001

Given the following plant conditions:

- A LOCA has occurred and a SAE has been declared.
- The TSC and OSC have been activated.
- To prevent core damage it is recommended that entry be made into Safety Injection Pump Room 1A.
- Projected dose rate in the pump room is 1.16×10^5 mr/hr.
- Duration of the exposure is expected to be 3 minutes.

Which ONE of the following must authorize this exposure?

- a. Radcon Manager
- ✓ b. Site Emergency Director
- c. Plant Manager
- d. Site Vice President

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

95. G2.3.6 001

Given the following plant conditions:

- Unit is operating at 100% power.
- A release of the Monitor Tank to Cooling Tower Blowdown is planned.
- 1-RM-90-122, Liquid Radwaste Effluent Monitor is inoperable.

Which ONE of the following identifies the requirements to make the planned release under these conditions?

- a. No release can be made until 1-RM-90-122 is returned to service.
- b. Sample results must show that activity of the release liquid is $<2 \times 10^{-4}$ microcuries per milliliter.
- ✓c. Two separate samples must be analyzed and two independent qualified members of facility staff verify release rate and discharge valve lineup.
- d. The tank must be recirculated for two volumes and a licensed Senior Reactor Operator must confirm release rate and discharge valve lineup.

96. G2.3.11 001

Which ONE of the following identifies the first radiation monitor that should respond to a SGTR and the effect on the monitor?

- a. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will be automatically isolated.
- ✓b. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will NOT be automatically isolated.
- c. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will be automatically isolated.
- d. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will NOT be automatically isolated.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

97. G2.4.1 001

Given the following conditions:

- Unit 1 in MODE 1 at 10% RTP.
- Turbine at 1800 rpm at no load (generator PCB open).
- Loss of offsite power occurs.
- Emergency Diesels fails to re-energize Shutdown Boards.

Which ONE of the following describes the correct usage of the Emergency Instructions?

- ✓a. Go directly to ECA-0.0 without entering E-0.
- b. Implement ECA-0.0 in conjunction with E-0.
- c. Go to ECA-0.0 from E-0 after verifying reactor and turbine trip.
- d. Complete E-0 IMMEDIATE ACTIONS then go immediately to ECA-0.0.

98. G2.4.7 002

Given the following plant conditions:

- Reactor trip and SI have occurred.
- Operators are using E-3, "Steam Generator Tube Rupture", to mitigate the event.

Which ONE of the following correctly describes the applicability of the low RCS pressure RCP trip criteria on the Foldout Page while performing steps of E-3?

- a. RCPs should be tripped during the performance of E-3 ANY TIME the foldout page low pressure RCP trip criteria are met.
- b. Low RCS pressure RCP trip criteria is not applicable in E-3 EXCEPT as an RNO if excessive RCS inventory loss is also experienced.
- ✓c. RCPs should be tripped during E-3 ONLY if the low RCS pressure RCP trip criteria is met before beginning the cooldown and depressurization.
- d. RCPs should be tripped during E-3 ONLY if the low RCS pressure RCP trip criteria is met during the performance of step 1 when the operator is specifically required to check the criteria.

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

99. G2.4.19 001

A step in ES-1.3, "Transfer to RHR Containment Sump", reads as follows:

ISOLATE SI pump miniflow:

- CLOSE FCV-63-3.
- CLOSE FCV-63-175.
- CLOSE FCV-63-4.

The bullets ("•") indicate that:

- a. The actions must be performed in the specified sequence, but once a step is in progress, the next step may be started.
- b. The actions must be performed and completed in the specified sequence.
- c. These actions should have been completed, so only verification may be required.
- ✓d. These actions must all be completed, but any sequence of completion is allowed.

**WATTS BAR NUCLEAR PLANT
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100. G2.4.48 001

Following Safety Injection reset during ES-1.1 the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PZR heater status the OAC would observe?

- a. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- b. Control group 1D ON.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- ✓c. Control group 1D OFF.
Backup group 1C ON.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- d. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A ON.
Backup group 1B-B ON.

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

Applicant Information

Name:	Region: I / II / III / IV
Date: 01/26/2001	Facility/Unit: Watts Bar Unit 1
License Level: RO / (SRO)	Reactor Type: W / 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. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

Applicant's Signature

Results

Examination Value	_____ Point.
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

NAME _____

SSN _____

1. (a) (b) (c) (d)

2. (a) (b) (c) (d)

3. (a) (b) (c) (d)

4. (a) (b) (c) (d)

5. (a) (b) (c) (d)

6. (a) (b) (c) (d)

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50. (a) (b) (c) (d)

51. (a) (b) (c) (d)

**WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR
NRC EXAMINATION**

NAME _____

SSN _____

52. (a) (b) (c) (d)

53. (a) (b) (c) (d)

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93. (a) (b) (c) (d)

94. (a) (b) (c) (d)

95. (a) (b) (c) (d)

96. (a) (b) (c) (d)

97. (a) (b) (c) (d)

98. (a) (b) (c) (d)

99. (a) (b) (c) (d)

100. (a) (b) (c) (d)

**WATTS BAR NUCLEAR PLANT
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1. Given the following plant conditions:

- Reactor is at 75% with a power increase in progress using control rods.
- The OAC determines that Control Bank D rod H-12 is not moving and is 14 steps below the other rods in D bank.
- Crew is performing AOI-2, "Malfunction of Reactor Control System" to realign control rod H-12 with the bank.

Which ONE of the following describes how control rod H-12 will be realigned to control bank D and how control bank insertion limit will change following the realignment?

- a. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be higher.
- b. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be lower
- c. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be lower.
- d. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be higher.

**WATTS BAR NUCLEAR PLANT
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2. Given the following conditions:

- A large break LOCA occurred
- Operators have just completed swapper to Containment Sump
- A loss of offsite power occurs

Which ONE of the following describes the actions required for this condition?

- a. Pull to lock SI pumps and CCPs until the RHR pumps have been restarted after the shutdown boards are reenergized.
- b. Pull to lock the CCPs until the RHR pumps are restarted after the shutdown boards are reenergized.
- c. Ensure both RHR pumps are started by the blackout sequencer after the diesel generators reenergize the shutdown boards then restart the SI pumps.
- d. Ensure all ECCS pumps are started by the blackout sequencer when the diesel generators reenergize the shutdown boards.

3. Given the following plant conditions:

- Reactor power is stable at 30%
- Loop 1 RCP trips

Assuming reactor power remains constant, core exit temperature will:

- a. increase, then stabilize at a higher value.
- b. decrease, then stabilize at a lower value.
- c. increase, then return to the original steady-state value.
- d. decrease, then return to the original steady-state value.

**WATTS BAR NUCLEAR PLANT
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4. Given the following conditions:

- Unit at 60% power.
- Confirmed Loop 1 RCP shaft vibration of 25 mils.

Which ONE of the following statements is correct per AOI-5, "Unscheduled Removal of One RCP", regarding the sequence of actions?

- a. RCP should be tripped prior to the reactor trip to minimize pump damage.
- b. The reactor should be tripped prior to tripping the RCP to prevent pressurizer level from dropping below 17%.
- c. RCP should be tripped prior to the reactor trip to prevent Reactor Coolant Bus voltage from dropping and tripping additional RCPs.
- d. The reactor should be tripped prior to tripping the RCP to prevent an automatic trip and an unnecessary challenge to a safety system.

5. Given the following plant conditions:

- Unit was operating at 58% power.
- Problems with #4 RCP required the pump to be shut down in accordance with AOI-5, "Unscheduled Removal of One RCP".

AOI-5 requires the plant to be in which ONE of the following conditions for restart of #4 RCP?

- a. < P-10.
- b. < P-9
- c. < P-8.
- d. Mode 3.

**WATTS BAR NUCLEAR PLANT
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6. Given the following plant conditions:

- Unit has experienced a Reactor trip.
- The crew transitions to ES-0.1, Reactor Trip Reponse.
- RCS temperature has dropped to 542°F.
- Step 2 RNO states:
 - REFER to AOI-34, Immediate Boration.

As the procedure reader, which ONE of the following is the proper method of applying this step?

- a. Transition from ES-0.1 to AOI-34 and when AOI-34 is completed return to ES-0.1.
- b. Read steps from AOI-34 in conjunction with ES-0.1 on a not to interfere basis.
- c. Continue in ES-0.1 and assign AOI-34 to another control room team member.
- d. Assign ES-0.1 to another control room team member and transition to AOI-34.

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7. Given the following plant conditions:

- Plant was operating at 100% power when a Main Feedwater pump trip resulted in a turbine runback.
- All systems in automatic and responded as expected to stabilize the plant.
- Control rods inserted beyond the Lo-Lo Rod Insertion limits.
- Operators implemented AOI-34, "Immediate Boration", in accordance with the ARI.

Which ONE of the following indicates the final, stable plant conditions AFTER completion of the boration as compared to those PRIOR to the boration?

	<u>Reactor Power</u>	<u>Rod Position</u>	<u>Tavg</u>
a.	Same	Higher	Higher
b.	Same	Higher	Same
c.	Lower	Lower	Same
d.	Lower	Lower	Lower

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8. Given the following plant conditions:

- ATWS without Safety Injection has occurred.
- Crew has implemented FR-S.1, "Nuclear Power Generation/ATWS", and currently performing step 4 to borate the RCS.

Which ONE of the following identifies the correct Operator action that must be taken in order to align charging pump suction?

- a. CLOSE LCV-62-132 and 133, VCT outlet isolation, then OPEN LCV-62-135 and 136, RWST supply to charging pump suction.
- b. OPEN LCV-62-135 and 136, RWST supply to charging pump suction, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- c. Verify LCV-62-135 and 136, RWST supply to charging pump suction AUTO OPEN, then CLOSE LCV-62-132 and 133, VCT outlet isolation.
- d. Verify LCV-62-135 and 136, RWST supply to charging pump suction and LCV-62-132 and 133, VCT outlet isolation AUTO OPEN.

9. Given the following plant conditions:

- The reactor trips due to a loss of all AC power (Station Blackout)
- The crew is currently performing ECA-0.0, Loss of Shutdown Power.
- Non-essential 125V and 250V battery loads are being shed per AOI-40, Station Blackout.
- The power loss occurred at 0938 hours.

Which ONE of the following is the latest time that AC power must be restored to ensure the station batteries are not fully discharged?

- a. 1138
- b. 1338
- c. 1538
- d. 1738

**WATTS BAR NUCLEAR PLANT
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10. Given the following plant conditions:

- Plant was operating at 100% power when a loss of offsite power occurred.
- Emergency Diesel Generators (D/G) failed to start and tie on to their associated 6.9KV Shutdown Boards.
- The operating Crew implemented ECA-0.0, "Loss of Shutdown Power".
- The OAC has started 1A-A D/G and re-energized it's associated Shutdown Board.
- Annunciator, "LOGIC PNL 1A-A LOAD STRIP RELAYS OUT OF SYNC OR UV TEST" (BO-AN alarm), is still LIT.

Which ONE of the following actions is required before this annunciator may be reset?

- a. Reset D/G 1A-A 86 LOR relay.
- b. Reset 1A-A Shutdown Board BOX and BOY relays.
- c. Transfer 1A-A Shutdown Board to it's normal power supply.
- d. Shutdown all the D/Gs that are not tied to associated Shutdown Board.

**WATTS BAR NUCLEAR PLANT
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11. Given the following plant conditions:

- Plant is operating at 100% power.
- A loss of 120V AC Vital Instrument Power Board 1-I occurred.
- The crew implements AOI-25.01, "Loss of 120V AC Vital Instrument Power Board 1-I".

Which ONE of the following identifies the train selector switches that must be selected for automatic control of feedwater and which loop 1 feedwater/steam flow indications are available?

	<u>Feedwater/Steam Flow Selector Switches</u>	<u>Feedwater/Steam Flow Indications</u>
a.	A train	Channel I
b.	A train	Channel II
c.	B train	Channel I
d.	B train	Channel II

12. Given the following plant conditions:

- Plant is operating a 100% power.
- Plant systems aligned and operating normally.
- Annunciator, CCS HX A 1-RM-90-123 LIQ RAD HIGH, is in alarm.

Which ONE of the following lists the type and source of radiation sensed by the radiation monitor that is in alarm?

- a. Gamma; Thermal Barrier leakage.
- b. Beta; Thermal Barrier leakage.
- c. Gamma; RCP motor cooler leakage.
- d. Beta; RCP motor cooler leakage.

**WATTS BAR NUCLEAR PLANT
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13. Which ONE of the following conditions concerning the Personnel Airlock would exceed a Limiting Condition for Operation and require entering an Action Statement of Technical Specifications?
- a. The lower containment airlock fails its LLRT while control rod unlatching is in progress.
 - b. Welding cables are laid through both lower containment airlock doors during RCS fill and vent at the end of an outage.
 - c. The lower containment airlock door interlocks are defeated while reactor vessel head is being tensioned.
 - d. The outer and inner doors are opened simultaneously during a normal cooldown prior to aligning RHR to the RCS.
14. Which ONE of the following is the reason S/Gs are depressurized to atmospheric pressure during the performance of FR-C.1, "Response to Inadequate Core Cooling"?
- a. Reduces RCS temperature to increase the thermal driving head for natural circulation.
 - b. Reduces RCS temperature to collapse any steam voids in the upper part of the vessel.
 - c. Reduces RCS pressure which prevents the formation of superheated steam in the core as water exceeds the critical point.
 - d. Reduces RCS pressure to allow the ECCS accumulators and RHR pumps to inject water to the RCS.

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15. Given the following plant conditions:

- Inadequate core cooling conditions exist
- Crew is performing FR-C.1, Inadequate Core Cooling

Which ONE of the following sets of actions states the proper sequence of the major action categories to be performed for removing decay heat from the core?

- a. Rapid secondary depressurization; reinitiation of high head safety injection; RCP restart
 - b. Reinitiation of high head safety injection; rapid secondary depressurization; RCP restart
 - c. Rapid secondary depressurization; RCP restart; reinitiation of high head safety injection
 - d. RCP restart; rapid secondary depressurization; reinitiation of high head safety injection
16. Which ONE of the following correctly describes the indication on the main steam line radiation monitors when the MR/HR AUTO pushbutton is lit on the RM-23 readout module?
- a. Indicates low range output only.
 - b. Indicates high range output only.
 - c. Automatically switches between the low and high range outputs every 45 seconds
 - d. Automatically switches between low and high range output based upon activity level in order to maintain accurate indication.

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17. Once an operating crew has entered the EOP network, which ONE of the following is the earliest that a transition may be made to ES-0.0, "Rediagnosis"?
- a. AFTER transition from E-0 and safety injection initiated.
 - b. AFTER transition from E-0 and NO safety injection initiated.
 - c. BEFORE transition from E-0 and safety injection initiated.
 - d. BEFORE transition from E-0 and NO safety injection initiated.

18. Given the following conditions:

- Main steam line break has occurred outside containment, resulting in a reactor trip/safety injection (SI).
- MSIV closure stopped the steam release.
- SI termination criteria was met and the crew is currently terminating the SI per ES-1.1, "SI Termination."

Which ONE of the following combinations of parameters would require an immediate reinitiation of safety injection? .

	<u>Maximum CTMT Press</u>	<u>RCS Subcooling</u>	<u>RCS Pressure</u>	<u>PZR Level</u>
a.	1 psig	75°F	Stable	18%
b.	2 psig	72°F	Decreasing	20%
c.	3 psig	87°F	Decreasing	34%
d.	4 psig	60°F	Stable	24%

**WATTS BAR NUCLEAR PLANT
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19. Given the following plant conditions:

- Operators are responding to a large break LOCA and have determined that degraded core cooling conditions exist.
- The crew has implemented FR-C.2, "Degraded Core Cooling".
- Preparations are in progress to depressurize all intact S/Gs to atmospheric pressure in accordance with FR-C.2.

Which ONE of the following is the reason the procedure directs all RCPs be stopped prior to performing the depressurization?

- a. Reduces the core ΔP which will enhance the ability of the RHR pumps to inject into the core.
- b. Minimizes heat input to the S/Gs allowing them to depressurize faster.
- c. Limits heat removal requirements to the core decay heat only.
- d. Anticipates a loss of RCP #1 seal ΔP requirements.

20. Given the following plant conditions:

- A large break LOCA has occurred that resulted in saturated core cooling conditions.
- RWST level is 28%
- Crew is performing step 4 of FR-C.3, Saturated Core Cooling to establish SI pump valve alignment.

Which ONE of the following identifies valves that should be verified CLOSED during performance of this step?

- a. FCV-63-6, 7 and 177, SI pump and Charging pump suction from RHR.
- b. FCV-63-47 and 48, SI pump suction valves
- c. FCV-63-152 and 153, SI pump cold leg injection cross-tie valves
- d. FCV-63-3, 4 and 175 SI pump mini-flow valves

**WATTS BAR NUCLEAR PLANT
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21. Given the following plant conditions:

- Reactor trip has occurred in conjunction with a loss of offsite power.
- The operating crew is currently performing steps of ES-0.2, "Natural Circulation Cooldown".
- Boration to Cold Shutdown boron concentration of 870 ppm has been completed.
- Chemistry reports the following boron concentrations:
 - 850 ppm in the pressurizer.
 - 1000 ppm in the RCS cold legs.

Which ONE of the following explains the difference in the boron concentration between the value calculated for Cold Shutdown and the values reported by Chemistry?

- a. Mixing only occurs in the active portions of the RCS cold legs causing RCS boron concentration to be higher than calculated.
- b. The cold legs remain subcooled during this event which causes boron to concentrate in these areas.
- c. PZR spray valves failed to automatically open on increasing pressure to ensure mixing between the cold legs and PZR.
- d. Due to the loss of power the PZR heaters are unavailable to promote mixing between the loops and the PZR.

**WATTS BAR NUCLEAR PLANT
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22. Given the following plant conditions:

- Reactor trip occurred with subsequent loss of RCPs.
- Operators have implemented ES-0.2, "Natural Circulation Cooldown".
- A cooldown rate of 25°F/hour has been established.
- RCS depressurization has been initiated while maintaining subcooling > 165°F.
- Operators are monitoring PZR level and RVLIS for void formation.
- The OAC observes that loss of inventory in the Condensate Storage Tank is imminent.

Which ONE of the following describes the appropriate procedural actions?

- a. Stop the cooldown and remain in ES-0.2.
- b. Raise the cooldown rate and remain in ES-0.2.
- c. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and lower the cooldown rate.
- d. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and raise the cooldown rate.

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23. Given the following plant conditions:

- Unit was at 100% power.
- A main steam line break occurred in the Turbine Building.
- Operators were unable to close the MSIVs and transitioned to ECA-2.1, Uncontrolled Depressurization of All Steam Generators.
- SI termination steps are in progress.
- Loop 3 MSIV is closed locally.
- The CRO observes the #3 SG pressure increasing slowly.

Which ONE of the following actions should be performed?

- a. Transition to E-2, "Faulted SG Isolation".
- b. Transition to ES-1.1, "SI Termination".
- c. Remain in ECA-2.1 until RHR is in service.
- d. Remain in ECA-2.1 until SI is terminated.

24. Which ONE of the following describes the reason for tripping all RCPs during the performance of FR-Z.1, "High Containment Pressure"?

- a. Removes heat transferred to the Containment atmosphere from the RCP motors.
- b. Prevents depletion of primary inventory out of the break during a small LOCA.
- c. Containment Isolation Phase B isolates cooling water to the RCPs and thermal barriers.
- d. Removes additional energy to the RCS during a break and subsequent release to containment.

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25. Given the following plant conditions:

- Reactor was at 100% power.
- A rod control system failure causes all shutdown rods to fall into the core.
- Power Range Indicators are at 6% and slowly decreasing (-0.1 DPM SUR).
- E-0, "Reactor Trip or Safety Injection" is implemented.
- Operators actuate both manual Rx trip handswitches.
- Both Rx trip breakers remain closed.

Which ONE of the following identifies the correct procedural response?

- a. Go to step 2 of E-0, "Reactor Trip or Safety Injection".
- b. Hold at step 1 of E-0 until Rx trip breakers are open locally.
- c. Transition to and perform FR-S.1, "Nuclear Power Generation/ATWS", then transition back to E-0.
- d. Transition to FR-S.1, "Nuclear Power Generation/ATWS", and transition back to E-0 when control rods are fully inserted into the core.

**WATTS BAR NUCLEAR PLANT
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26. Given the following plant conditions:

- Unit 1 operating at 22% power.
- Reactor Trip Breakers "A" & "B" closed.
- Bypass Breaker B is racked in and closed.
- "B" Train SSPS Input Error Inhibit Switch is in INHIBIT for surveillance testing.

Which ONE of the following describes the response of the Reactor Trip and Bypass Breakers if RCS pressure drops below the Low Pressure Reactor trip setpoint with no operator action?

- a. Reactor Trip Breakers "A" & "B" open, Bypass Breaker "B" opens.
- b. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" remains closed.
- c. Reactor Trip Breaker "B" opens and "A" remains closed, Bypass Breaker "B" opens.
- d. Reactor Trip Breaker "A" opens and "B" remains closed, Bypass Breaker "B" opens.

27. Given the following plant conditions:

- Unit was at 100% power.
- All systems operating in automatic and all plant parameters at their normal values.
- 1-PCV-68-340 failed partially open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 45 psig?

- a. 228°F.
- b. 250°F.
- c. 275°F.
- d. 290°F.

**WATTS BAR NUCLEAR PLANT
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28. Given the following plant conditions:

- The plant is at steady state 100% power equilibrium xenon with all control systems in automatic.
- Pressurizer level control is transferred to MANUAL and level is slowly increased to 75% and maintained.

Which ONE of the following describes the PZR pressure response?

- a. Pressure is essentially unaffected.
- b. Pressure will continuously cycle between 2235 and 2260 psig.
- c. Pressure will increase until the spray valves open and control pressure at 2260 psig.
- d. Pressure will increase until the spray valves open and slowly return pressure to steady state 2235 psig.

29. Given the following plant conditions:

- The Unit is at 100% load.
- Pressurizer pressure channel selector switch, 1-XS-68-340D, is in the PT-68-340 & 334 position.
- Instrument Maintenance has 1-PT-68-323 (CH III) OOS for a loop calibration.
- PZR Pressure transmitter, 1-PT-68-334 (CH II) has just failed AS IS.
- The operating crew implements AOI-18, "Malfunction of Pressurizer Pressure Control System".

Which ONE of the following channels will be selected on 1-XS-68-340D and position of the master controller following completion of AOI-18, Malfunction of Pressurizer Pressure Control System?

- a. Channel I and III selected with 1-PIC-68-340A in AUTO.
- b. Channel I and III selected with 1-PIC-68-340A in MANUAL.
- c. Channel I and IV selected with 1-PIC-68-340A in AUTO.
- d. Channel I and IV selected with 1-PIC-68-340A in MANUAL.

**WATTS BAR NUCLEAR PLANT
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30. Given the following plant conditions:

- The Unit is in MODE 6.
- Source Range Monitor (SRM) NI-132 has failed LOW resulting in a loss of the audio count rate signal.

WHICH ONE of the following describes the actions necessary to restore the audio count rate signal to the control room.

- a. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N31 position.
- b. Place the audio count rate CHANNEL SELECTOR switch on the front of the Audio Count Rate Drawer to the SR N32 position.
- c. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A1 position.
- d. Place the AMPLIFIER SELECT switch on the rear of the audio count rate drawer assembly to the A2 position.

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31. Given the following plant conditions:

- A Reactor startup in progress.
- Reactor power is stable at $2 \times 10^{-2}\%$ power on the Intermediate Range
- Intermediate Range channel N-135 was declared inoperable and removed from service per AOI-4, "Nuclear instrumentation Malfunction".

Which ONE of the following describes the plant response if an I&C Technician mistakenly removes the control power fuses for N-135 during troubleshooting activities?

- a. The trip bistable deenergizes and a reactor trip occurs because power is below P-10.
- b. The trip bistable deenergizes, however NO trip occurs because N-135 is bypassed.
- c. The trip bistable energizes, however NO trip occurs because N-135 is bypassed.
- d. The trip bistable energizes and a reactor trip occurs because power is below P-10.

32. Given the following plant conditions:

- Steam Generator Tube Rupture has occurred.
- Crew has implemented E-3, "Steam Generator Tube Rupture".
- The operators have completed cooldown to target incore temperature of 480°F.

Which ONE of the following identifies the pressure that steam dumps will be set to control RCS temperature at 480°F?

- a. 580 - 585 psig.
- b. 550 - 555 psig.
- c. 580 - 585 psia.
- d. 550 - 555 psia.

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33. Given the following plant conditions:

- AUO reports Emergency Diesel Generator (D/G) 1A-A has lost 125V DC control power from it's associated Diesel Battery Distribution Panel
- D/G 1A-A is NOT running.

Which ONE of the following describes how this loss of DC control power would affect D/G operation?

- a. D/G would start in response to an automatic or manual start signal.
- b. D/G cannot be started by automatic or manual start signal.
- c. D/G can only be started manually from local control panel.
- d. D/G can only be started manually from the MCR panel.

34. Given the following conditions:

- Unit at 100% power.
- The Control Room Air Intake radiation monitor, 1-RM-90-125, alarms.

Which ONE of the following describes the response of the Control Building Ventilation System?

- a. Pressurization fans inlet dampers CLOSE
Emergency Pressurization fans inlet dampers OPEN
Air cleanup fans inlet dampers OPEN
- b. Pressurization fans inlet dampers OPEN
Emergency Pressurization fans inlet dampers CLOSE
Air cleanup fans inlet dampers OPEN
- c. Pressurization fans inlet dampers CLOSE
Emergency Pressurization fans inlet dampers OPEN
Air cleanup fans inlet dampers CLOSE
- d. Pressurization fans inlet dampers OPEN
Emergency Pressurization fans inlet dampers CLOSE
Air cleanup fans inlet dampers CLOSE

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35. Given the following plant conditions:

- A Gas Decay Tank release in progress with ABGTS running for dilution air flow.
- A leak occurs on the waste gas compressor which results in a gas release to the Auxiliary Building.
- 0-RE-90-101, Auxiliary Building Vent Monitor, is in alarm.

Which ONE of the following indicates the effect this leak will have on the plant?

- a. Gas Decay Tank release will be terminated; ABGTS will be stopped.
 - b. Gas Decay Tank release will be terminated; ABGTS will continue to run.
 - c. Gas Decay Tank release will continue; ABGTS will be stopped.
 - d. Gas Decay Tank release will continue; ABGTS will continue to run.
36. Following an automatic start due to low instrument air pressure, which ONE of the following describes what will cause Aux Air Compressors to shutdown?
- a. Running unloaded for 5 mins.
 - b. Running unloaded for 10 mins.
 - c. Low crankcase oil pressure.
 - d. High discharge air temperature.

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37. Given the following plant conditions:

- A small break LOCA has occurred
- 1B-B CCP and SIP failed to start and could not be started manually.
- E-1 is completed and transition to ES-1.2, "Post LOCA Cooldown and Depressurization", made.
- 6.9kV Shutdown Board 1A-A is de-energized due to a fault
- The following conditions are noted by the OAC
 - RCS pressure is 1600 psig
 - Containment pressure is 6 psig

Which ONE of the following describes the action that should be taken and the basis for that action?

- a. All RCPs should be stopped to limit heat input during the RCS cooldown.
 - b. All RCPs should be stopped because Phase B isolation has occurred.
 - c. All RCPs should NOT be stopped because no CCP or SIP is injecting into the RCS.
 - d. All RCPs should NOT be stopped because the RCS pressure is above 1500 psig.
38. Which ONE of the following is the significance of draining the SG U-tubes and blowing the inverted "loop seal" during a cold leg small break LOCA?
- a. A steam vent path is established from the core to the break location and mass loss from the system is decreased.
 - b. Core cooling will be lost after the loop seal is blown due to increased injection flow being diverted to the break location.
 - c. RCS pressure control will be lost resulting in a challenge to Pressurized Thermal Shock limits.
 - d. The heat sink effect of the water in the "crossover" leg is lost when the loop seal is lost resulting in a degraded core cooling.

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39. Given the following plant conditions:

- Reactor trip and safety injection occurred.
- The crew implemented FR-H.1, "Loss of Secondary Heat Sink" due to heat sink red path.
- Operators are preparing for main feedwater startup.

Which ONE of the following lists the minimum actions required to reset Main Feedwater Pump 1A?

- a. Reset safety injection and cycle reactor trip breakers.
- b. Reset safety injection and reset feedwater isolation signal.
- c. Cycle the reactor trip breakers and reset feedwater isolation signal.
- d. Reset safety injection, cycle reactor trip breakers, and reset feedwater isolation signal.

40. Given the following plant conditions:

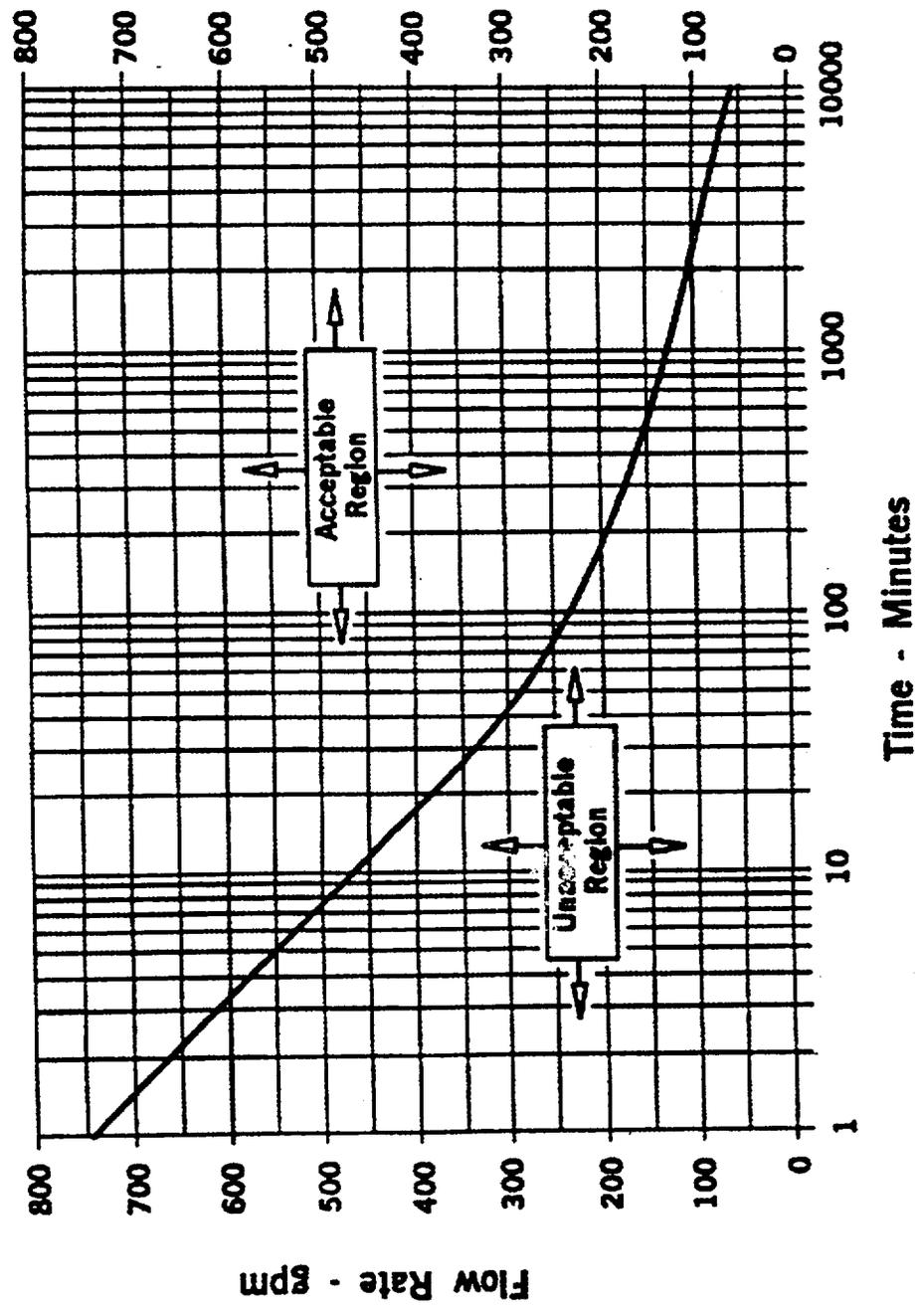
- Reactor trip and SI occurred at 0200 due to a small LOCA.
- At 0300 the crew transitioned to ECA-1.1, "Loss of RHR Sump Recirculation", due to the failure of both RHR pumps.
- Crew has reduced ECCS flow to 1 SIP and 1 CCP per ECA-1.1.
- At 0500 the crew is performing step 17 RNO to establish the minimum required ECCS flow to remove decay heat.

Using Figure 1 from ECA-1.1, which ONE of the following flow rates would satisfy the intent of the RNO?

- a. 180 gpm
- b. 210 gpm
- c. 240 gpm
- d. 280 gpm

Minimum SI Flow for Decay Heat vs. Time After Trip

FIGURE 1



ECA111

**WATTS BAR NUCLEAR PLANT
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41. Given the following plant conditions:

- The Unit is at 100% power.
- PZR level channel 1-LT-68-335 has failed HIGH
- Operating crew has addressed the failure per AOI-20, Malfunction of Pressurizer Level Control

In response to the failure, which ONE of the following will most likely require a safety evaluation?

- a. A non-intent procedure change to AOI-20 is submitted to clarify a step.
- b. A special test is performed on PZR level channel 1-LT-68-335 to determine automatic actions.
- c. A surveillance is required to be performed on channel 1-LT-68-339 while 1-LT-68-335 is out of service.
- d. Post maintenance test is required to be performed on 1-LT-68-335 prior to returning channel to service.

42. Given the following plant conditions:

- Plant is in Mode 6 with core offload in progress.
- The fuel assembly being withdrawn into the refueling mast is dropped onto the lower core plate.
- The refuel crew observes bubbles coming from the dropped fuel assembly.

Which ONE of the following identifies the most likely indications/actions as a result of this incident?

- a. Upper Containment area radiation monitor, 1-RM-90-59, alarms only.
- b. Spent Fuel Pit area radiation monitor, 1-RM-90-102, alarms only.
- c. Shield Bldg vent monitor, 1-RM-90-400, initiates Containment Vent Isolation.
- d. Spent Fuel Pit area radiation monitor, 1-RM-90-1, initiates Auxiliary Bldg Isolation.

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43. Which ONE of the following describes why the baseline count rate used for developing the 1/M plot must be re-calculated following movement of any source bearing fuel assembly ?
- a. Re-verify the operability of the source range instruments.
 - b. Ensures an accurate 1/M plot to monitor subcriticality.
 - c. Determine adequate shutdown margin during refueling.
 - d. Readjust the setpoint for the High Flux at Shutdown alarm.

44. Given the following plant conditions:

- The Unit is at 1% power after an extended shutdown.
- Core burnup is 2000 MWD/MTU.
- RCS boron concentration is 1000 ppm.
- Control rods at 175 steps
- The STA has determined that 236 pcm of reactivity must be added to increase power to 10%.

Using the attached NUPOP curve and assuming no control rod movement, which ONE of the following identifies the final boron concentration of the RCS after the reactivity change has been made?

- a. 966 ppm
- b. 969 ppm
- c. 1031 ppm
- d. 1034 ppm

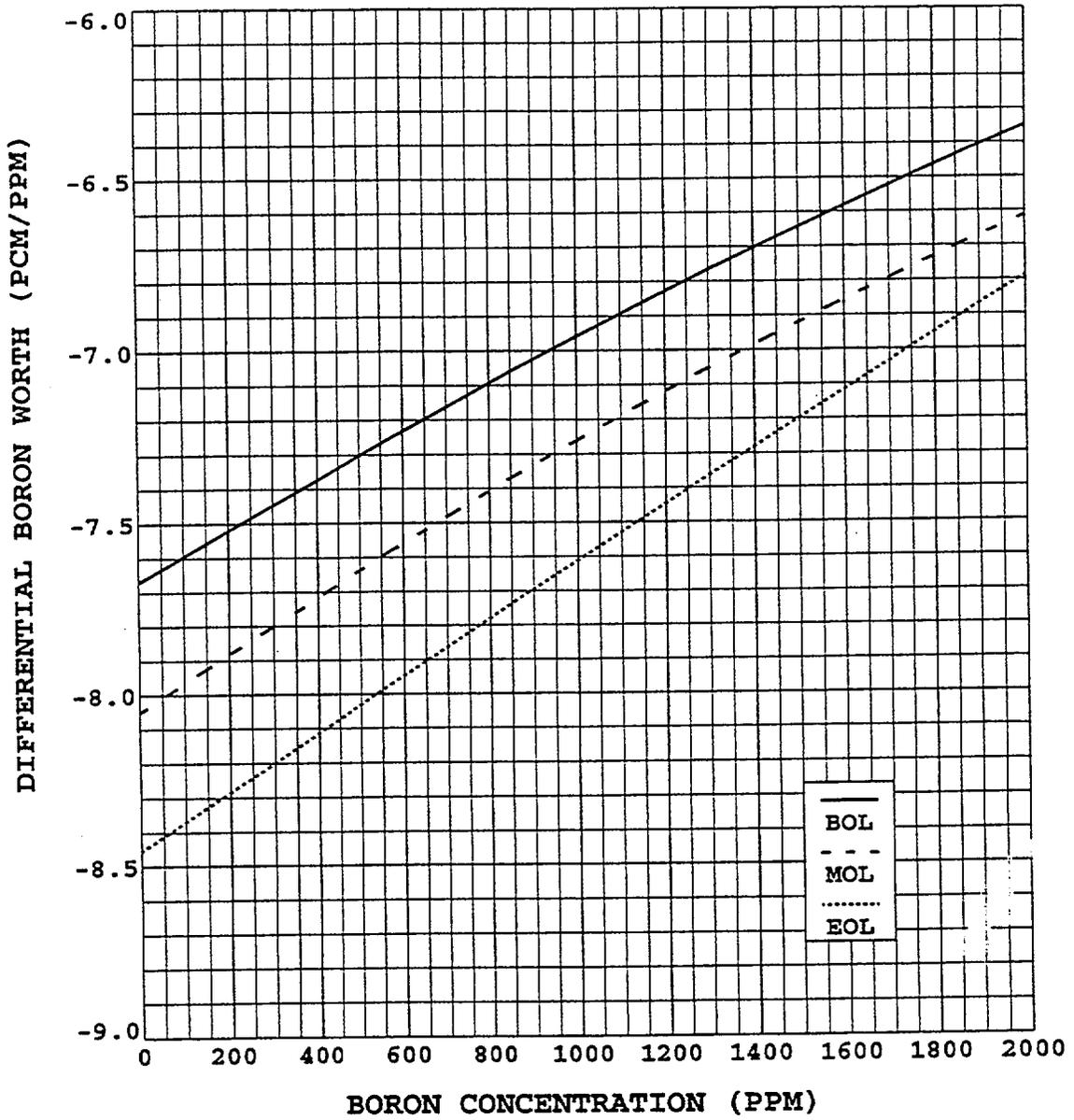


Figure 6-22 Differential Boron Worth Versus Boron Concentration at BOL, MOL, and EOL, HZP, With No Xenon

**WATTS BAR NUCLEAR PLANT
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45. Unit is operating at 100% power with all systems in their normal configuration, when Auctioneered High Tavg fails LOW.

Which ONE of the following describes the plant response?

- a. Control rods will step in; Charging Flow Control valve, 1-FCV-62-93, opens.
 - b. Control rods will step out; Charging Flow Control valve, 1-FCV-62-93, closes.
 - c. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, opens.
 - d. Control rods will not move; Charging Flow Control valve, 1-FCV-62-93, closes.
46. Given the following plant conditions:

- Unit is operating at 20% power with a startup in progress.
- A problem develops which requires removal of Loop 1 RCP
- At 1101, using ICS, you determine the following conditions exist:
 - Motor Bearing Temperature is 180°F and increasing at 1°F/min.
 - Motor Winding Temperature is 315°F and stable.
 - Pump Bearing Temperature is 220°F and increasing at 1°F/min.

Which ONE of the following correctly describes when loop 1 RCP must be removed from service and the effects on loop 1 steam flow when the RCP is stopped?

- a. 1101; RCS loop 1 hot leg temperature decreases; Steam flow decreases.
- b. 1101; RCS loop 1 hot leg temperature increases; Steam flow decreases.
- c. 1106; RCS loop 1 hot leg temperature decreases; Steam flow increases.
- d. 1106; RCS loop 1 hot leg temperature increases; Steam flow increases.

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47. Given the following plant conditions:

- The Unit is operating at 100% power.
- All systems are operating normal.
- Annunciator "RCP #1 Seal Outlet Temp Hi" alarm actuates.
- The operator verifies that ALL RCP seal temperatures are 180°F rising.

Which ONE of the following is the most probable cause of this alarm?

- a. The Charging Pump suction has swapped to the RWST.
- b. The operator has just placed Excess Letdown in service at maximum flow rate.
- c. The Letdown Heat Exchanger temperature control valve 1-TCV-70-192 has failed closed.
- d. A loss of control air to charging flow control valve 1-FCV-62-93.

48. Given the following conditions:

- Reactor power 35%.
- Turbine load 32%
- Control Rods are in AUTOMATIC.
- CVCS Mixed Bed A was placed in service resulting in a T-avg increase to 571°F.

Which ONE of the following describes the response of the rod control system?
(assume no operator action)

- a. Rods will step in at 8 steps per minute.
- b. Rods will step in at 40 steps per minute.
- c. Rods will step in at 64 steps per minute.
- d. Rods will step in at 72 steps per minute.

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49. Given the following plant conditions:

- The unit is at 100% power with 1A-A CCP is in operation.
- A loss of offsite power occurs
- All appropriate loads sequence onto the Shutdown Boards
- The crew has implemented E-0, "Reactor Trip or Safety Injection"
- While the immediate actions are being completed, a safety injection signal (SI) is received.

Which ONE of the following describes the response of the Centrifugal Charging Pumps (CCPs)?

- a. 1A-A CCP load sheds on the SI signal, and both CCPs auto sequence on the shutdown boards.
- b. 1A-A CCP load sheds on the SI signal, and must be restarted manually by the operator.
- c. 1A-A CCP does not load shed on the SI signal, and 1B-B CCP auto sequences on the shutdown boards.
- d. Both CCPs remain energized and running following the SI signal.

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50. Given the following:

- 1A-A and 1B-B SI Pump breakers are "Racked In".
- A fuse blows in the NORMAL DC Trip circuit for the 1A-A SI pump.
- A safety injection (SI) actuation occurs.

Which ONE of the following describes the response of the SI Pumps to the SI signal?

- a. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start until the control power supply is transferred.
- b. 1B-B SI Pump will auto start, but 1A-A SI Pump will not auto start and must be started from the MCR handswitch.
- c. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped from the MCR.
- d. Both SI Pumps will auto start, but the 1A-A SI Pump cannot be stopped mechanically at the breaker.

51. Which ONE of the following describes the logic for Safety Injection (SI) actuation handswitches and reset pushbuttons?

- a. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets both trains of SI.
- b. Each actuation handswitch initiates both trains of SI.
Each reset pushbutton resets only it's associated train of SI.
- c. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets only it's associated train of SI.
- d. Each actuation handswitch initiates only it's associated train of SI.
Each reset pushbutton resets both trains of SI.

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52. Given the following plant conditions:

- Unit is operating at 75% power
- A plant transient has resulted in a xenon oscillation
- Control rods are currently at 216 steps on D bank

Which ONE of the following is the effect of the xenon oscillation on NIS and the action required to dampen the oscillation?

- a. The oscillation affects AFD and is dampened by inserting control rods at its most positive peak.
- b. The oscillation affects AFD and is dampened by inserting control rods at its most negative peak.
- c. The oscillation affects QPTR and is dampened by dropping turbine load at its highest value.
- d. The oscillation affects QPTR and is dampened by dropping turbine load at its lowest value.

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53. Given the following plant conditions:

- A small break LOCA has occurred.
- The crew responded IAW EOPs and tripped the RCPs when required.
- The crew is currently in ES-1.2, "Post LOCA Cooldown And Depressurization".
- RCS pressure is 1490 psig.
- Wide range Tc's are 505°F and decreasing slowly.
- Wide range Th's are 515°F and decreasing slowly.
- Core exit thermocouples (CETC) are 551°F and stable.
- Containment pressure is 1.5 psig.
- SG levels are being maintained at 38%.
- SG pressures are 715 psig and decreasing slowly.

Which ONE of the following describes the status of natural circulation for the existing plant conditions?

- a. Cannot be assured, since there is inadequate sub-cooling.
- b. Cannot be assured, since SG parameters are not satisfied.
- c. Cannot be assured, since CETCs are not decreasing.
- d. Exists since all natural circulation criteria are met.

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54. Given the following plant conditions:

- Reactor trip & Safety Injection occurred due to Large Break LOCA.
- Containment ØB isolation has occurred.
- All systems responded normally.

Which ONE of the following describes the response of the Lower Compartment Coolers when ØB is reset?

- a. Fans in A-P-AUTO start .
Cooler ERCW isolation valves open.
- b. Fans in A-P-AUTO start.
Cooler ERCW isolation valves remain closed.
- c. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves open.
- d. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves remain closed.

55. Given the following plant conditions:

- Main Steam Line Break occurred inside containment causing a reactor trip and safety injection.
- Operators have implemented the EOPs.
- Containment pressure is 3.2 psig and dropping.
- OAC observes the "INSTR ROOM COOLER A/B FLOW LOW" alarm LIT.

Which ONE of the following ESFAS signals caused the Incore Instrument Room Cooling fans, circ pump, and chiller to shut down?

- a. Containment vent isolation (CVI).
- b. ØA containment isolation.
- c. ØB containment isolation.
- d. Aux. Building Isolation (ABI)

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56. Given the following plant conditions:

- Large break LOCA has occurred causing a reactor trip and safety injection.
- OAC observes annunciator "Glycol Exp Tank Level Hi/Hi-Hi is LIT.

Which ONE of the following describes the most likely reason the annunciator is LIT?

- a. ØA closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- b. ØA closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.
- c. ØB closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the containment side of the isolation valves relieve glycol into the glycol expansion tank.
- d. ØB closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.

57. Given the following plant conditions:

- Large break LOCA has occurred.
- Swapover to containment sump was unsuccessful and crew has implemented ECA-1.1, "Loss of RHR Sump Recirculation".
- Containment Spray has been aligned to the containment sump.
- Unit Supervisor has directed the OAC to initiate makeup to the RWST.

Which ONE of the following lists the preferred makeup source to the RWST?

- a. Transfer water from the Holdup Tank.
- b. Transfer water from the Spent Fuel Pit.
- c. Align Containment Spray to the RWST.
- d. Align CVCS blender to makeup.

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58. Given the following conditions:

- Unit is operating at 100% power.
- FCV-2-35, Condensate Short Cycle valve fails OPEN

Which ONE of the following describes the effect on reactor power and the correct operator response?

Reactor power will:

- a. Increase; Borate the RCS.
 - b. Increase; Reduce turbine load.
 - c. Decrease; Dilute the RCS.
 - d. Decrease; Raise turbine load.
59. Which ONE of the following describes the decay heat sources and design basis for the Auxiliary Feedwater (AFW) System during a loss of offsite power?
- a. Prevents relief through the PZR safety valves by removing core decay heat only.
 - b. Prevents relief through the S/G safety valves by removing core decay heat only.
 - c. Prevents relief through the PZR safety valves by removing core decay heat and stored RCS heat .
 - d. Prevents relief through the S/G safety valves by removing core decay heat and RCP heat.

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60. Given the following plant conditions:

- Reactor tripped on lo-lo SG level.
- All MSIVs are closed.
- All feedwater reg and bypass reg valves are closed.
- Turbine Driven AFW pump is the ONLY AFW pump running.
- All DGs are running unloaded.

Which ONE of the following correctly lists the 125V DC Vital Battery Board(s) that is/are deenergized?

- a. Only Board I.
- b. Only Board III.
- c. Board I and II.
- d. Board I and III.

61. Given the following plant conditions:

- Unit is at 100% power.
- "A" Waste Gas Compressor is in service.
- Pressure in the "in service" Waste Gas Decay Tank (WGDT) is 60 psig.
- No WGDT release is in progress
- The relief valve on the "in service" WGDT begins to experience seat leakage.

Which ONE of the following will provide the best indication that the relief valve on the WGDT is leaking?

- a. Increasing count rates on RM-90-101A, Auxiliary Building Vent Monitor.
- b. Increasing count rates on RM-90-400, Shield Building Vent Monitor.
- c. FCV 77-119, Plant Vent Flow Control valve, isolates due to high radiation.
- d. The Waste Gas Vent Header pressure increases causing the Waste Gas Compressor to run continuously.

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62. Given the following plant conditions:

- A source check is being performed on Spent Fuel Pool Monitor (RE-90-102).
- Auto Block handswitches are in the OFF position.

Which ONE of the following will occur when the control switch is placed in "SOURCE CHECK"?

- a. The fuel handling area ventilation system is diverted to the suction of the EGTS system.
- b. The green light on the monitor goes out indicating that the monitor is being source checked.
- c. Auxiliary Building Ventilation isolates, but no Auxiliary Building isolation signal is generated.
- d. A Containment Ventilation Isolation signal is generated.

63. Given the following plant conditions:

- The reactor is at 100% power
- Rod control is in automatic.
- Power Range nuclear instrument N-42 fails HIGH.

Which ONE of the following describes the rod control and plant response?

- a. Rods move in until the power mismatch rate signal decays, then move out to the original position to correct the temperature error.
- b. Rods move in until the power mismatch rate signal decays, then remain at the new position with a reduced T-avg.
- c. Rods move out until the power mismatch rate signal decays, then move in to the original position to correct the temperature error.
- d. Rods move out until the high power rod block is reached, then remain at the new position with a higher T-avg.

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64. Given the following plant conditions:

- Unit was at 100% power.
- A spurious Safety Injection occurs.
- Operators are responding per the EOP network and have just transitioned to ES-1.1, "SI Termination".
- Annunciators "PRT LEVEL HI/LO, PRESS HI, and TEMP HI" alarm.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

- a. Pressurizer PORVs, 1-PCV-68-340 and 334, have lifted.
- b. CVCS Letdown Header Relief valve, 1-RLF-62-662 has lifted.
- c. RHR Pump Discharge Relief valve, 1-RLF-63-620, has lifted.
- d. RCP #1 Seal Leakoff Relief Valve, 1-RLF-62-636, has lifted.

65. Given the following plant conditions:

- Operating at 100% power.
- PZR PORV, PCV 68-340, is leaking through.
- PRT pressure increases resulting in rupture of the PRT diaphragm.

What effect will the rupture of the PRT diaphragm have on PRT temperature and leakage through the PORV?

	<u>PRT Temp</u>	<u>PORV Leakage</u>
a.	Rises	Rises
b.	Rises	Drops
c.	Drops	Rises
d.	Drops	Drops

**WATTS BAR NUCLEAR PLANT
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66. Given the following plant conditions:

- Unit is operating at 100% power.
- PZR PORV testing is in progress
- While Operators are raising PRT level to reduce PRT Oxygen content the PRT PRESS HI alarm annunciates.

Which ONE of the following automatic actions will occur?

- a. The WDS vent header control valve PCV-68-301 will CLOSE.
- b. The primary water supply valve, FCV-68-303 will CLOSE.
- c. The PRT drain valve to RCDT FCV-68-310 will OPEN.
- d. The PRT nitrogen supply isolation valve FCV-68-305 will CLOSE.

67. Given the following plant conditions:

- Unit is operating at 100% power.
- Controlling PZR level transmitter, 1-LT-68-339 failed LOW.
- The OAC observes annunciator, "PZR LEVEL HI/LO", LIT with PZR level at 72% and slowly rising.

Which ONE of the following lists the status of PZR heaters and charging after the failure? (assume NO operator action)

- a. All back-up heaters energized; charging flow at minimum of 0 gpm.
- b. All back-up heaters energized; charging flow at minimum of 35 gpm.
- c. All back-up heaters deenergized; charging flow at minimum of 0 gpm.
- d. All back-up heaters deenergized; charging flow at minimum of 35 gpm.

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68. Which ONE of the following would result in the OP Δ T reactor protection trip setpoint being reduced? Consider each parameter independently.
- a. ΔT increasing.
 - b. Tavg increasing.
 - c. PRZ pressure decreasing.
 - d. Reactor Power decreasing.

69. Given the following plant conditions:

- The operating crew is responding to a reactor trip due to a loss of 120V AC Vital Instrument Power Bd I.
- PZR pressure transmitter 68-334 (Channel II) failed LOW.

Which ONE of the following describes the plant response?

- a. Both trains of SSPS SI master relays would actuate AND both trains of ECCS equipment auto start.
- b. Both trains of SSPS SI master relays would actuate BUT only "B" train ECCS equipment auto start.
- c. Only the "B" train SSPS SI master relays would actuate BUT both trains of ECCS equipment auto start.
- d. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment auto start.

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70. Given the following plant conditions

- Unit is at 100% power.
- 1A-A 6.9 KV Shutdown Board is out of service for maintenance.
- A reactor trip and safety injection (SI) is initiated due to a large break LOCA.
- Automatic and manual "B" train Safety Injection fails to actuate.

With no further operator action, which ONE of the following describes the status of the Emergency Gas Treatment System (EGTS)?

- a. Both trains are running
- b. Only "A" train is running
- c. Only "B" train is running
- d. Neither train is running

71. Given the following plant conditions:

- A large break LOCA occurs from 100% power.
- "B" Hydrogen recombiner is tagged out.
- "A" Hydrogen Recombiner has been placed in service.
- Subsequently the "A" Hydrogen Recombiner trips on overcurrent.

Which ONE of the following indicates how the concentration of hydrogen will be controlled inside containment if the "A" Hydrogen Recombiner trips?

- a. Containment Purge Supply and Exhaust fans are placed in service to dilute the hydrogen concentration in containment.
- b. A continuous vent path is provided that allows hydrogen to vent to the annulus and then be removed by EGTS.
- c. Air Return Fans create a mixing effect and the hydrogen igniters will burn hydrogen to maintain it below an explosive concentration.
- d. Emergency Gas Treatment System will remove hydrogen which collects in the containment dome and discharge to the shield building vent.

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72. Which ONE of the following describes a feature of the Refueling Machine designed to prevent the accidental release of a fuel assembly?
- a. Gripper is mechanically engaged and disengaged by remote operating handle on bridge and requires no power or air to operate.
 - b. Gripper requires air to disengage, however a mechanical latch prevents gripper release under load even if air is applied.
 - c. Gripper disengages upon loss of air, however a mechanical latch prevents gripper release under load even if air is removed.
 - d. When gripper is engaged, operators mechanically lock gripper in place with extension shaft which must be unlocked before gripper can release.

73. Given the following plant conditions:

- Core load is in progress.
- A failure of the Reactor Cavity Seal occurred.
- Cavity level is currently el. 748' and dropping slowly.

Which ONE of the following actions is required per AOI-29, "Dropped or Damaged Fuel or Refueling Cavity Seal Failure"?

- a. Align RHR suction to the RWST and discharge to the RCS through the hot legs.
- b. Align CCP suction to RWST and discharge to the RCS through normal charging.
- c. Start one SI pump in the cold leg injection flowpath for cavity makeup.
- d. Align Refueling Water Purification pumps suction to RWST and discharge directly to refueling cavity.

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74. Given the following plant conditions:

- Startup in progress.
- Operators are warming the main steam lines using the MSIV bypasses.
- The OAC observes that the RCS has cooled down 108°F in the past hour.
- The CRO observes that the main steam lines have heated up 102°F in the past hour.

Which ONE of the following indicates the actions that should be taken by the operators and why?

- a. Close the MSIV bypass valves; RCS cooldown limit was exceeded.
- b. Close the MSIV bypass valves; main steam line heat-up limit was exceeded.
- c. Close the MSIV bypass valves; both RCS and main steam line limits were exceeded.
- d. Leave MSIV bypass valves open; NO RCS or main steam line limits were exceeded.

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75. Given the following plant conditions:

- Reactor coolant system pressure has decreased to 1930 psig during a plant cooldown.
- The operator has placed the Low Steam Line Pressure Block switches HS-63-135 A & B to BLOCK.

Which ONE of the following describes the status of the Safety Injection and Main Steam Line isolation signals?

- a. Only the low steamline pressure MSIV isolation is blocked; low steamline pressure SI is operational.
- b. Only the low steamline pressure SI signal is blocked; low steam line pressure MSIV isolation is operational.
- c. Both the high steamline pressure negative rate MSIV isolation and high steamline pressure negative rate SI signal are operational.
- d. Both the low steam line pressure MSIV isolation and low steam line pressure SI signal are blocked.

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76. Given the following plant conditions:

- Plant is in Mode 5.
- "A" train RHR is in operation controlling RCS temperature at 120°F.
- RCS level is at elevation 718'10"
- MEG requests that Emergency Diesel Generator (D/G) 1A-A be tagged out to replace the voltage regulator with a new model.

Which ONE of the following describes how this request should be handled?

- a. D/G 1A-A may NOT be removed from service at this time to protect RHR train "A".
- b. D/G 1A-A may NOT be removed from service at this time since both the 1A-A and 1B-B D/G are required to be operable by Tech Specs.
- c. D/G 1A-A may be removed from service at this time as long as one offsite circuit is operable.
- d. D/G 1A-A may be removed from service at this time as long as risk guidance was obtained from the PSA engineering group.

77. Given the following plant conditions:

- Unit is at 100% power
- High radiation alarms are in on Steam Generator Blowdown (SGBD) radiation monitors 1-RM-90-120 and 121.

Which ONE of the following describes the SGBD System response?

- a. The SGBD Containment isolation valves, FCV-15-181 through 184, close.
- b. The SGBD Cooling Tower blowdown isolation valve, FCV-15-44, closes.
- c. The SGBD to Condensate Header isolation Valve, FCV-15-6, closes.
- d. The SGBD flow control valve, FCV-15-43, closes.

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78. Given the following conditions:

- A loss of offsite power has occurred.
- Tavg is 557°F.
- Steam Dump controls are in the Steam Pressure mode.
- Steam dump demand is manually increased to begin cooldown.
- Steam Dump valves will NOT open.

Which ONE of the following explains why the Steam Dump valves will NOT open?

- a. P-4, Reactor Trip, has not been actuated.
- b. C-9, Condenser Available, interlock is not met.
- c. P-12, Lo-Lo Tavg, has disarmed the Steam Dump system.
- d. C-7, Load Rejection controller, has not been actuated.

79. Given the following plant conditions:

- Reactor trip and safety injection occurred while the plant was operating at 100% power.
- Four ERCW pumps were running in their normal alignment before the SI occurred.

Which ONE of the following identifies ERCW pump status after the SI and the effect it has on the Condenser Circulating Water (CCW) system make-up?

- a. Four ERCW pumps running; CCW make-up is provided only from ERCW since RCW bypass strainer is isolated.
- b. Eight ERCW pumps running; CCW make-up is provided only from RCW since ERCW is routed through the overflow structure.
- c. Four ERCW pumps running; CCW make-up provided from both RCW and ERCW.
- d. Eight ERCW pumps running; CCW make-up is not required since the unit is tripped.

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80. Given the following plant conditions:

- Unit was operating at 100% power.
- A large break LOCA resulted in a reactor trip and safety injection.
- Alignment to Cold Leg Recirculation is in progress.
- 1-FCV-63-8, 1A-A RHR Pump to CCP suction, will NOT open from the Control Room.

Assuming all other equipment functions as expected, which ONE of the following would prevent the valve from opening?

- a. SI pump minimum flow valve 1-FCV-63-175 open.
- b. RHR pump suction from RWST 1-FCV-63-1 open.
- c. Containment sump suction valve 1-FCV-63-72 closed.
- d. The A train safety injection signal has been reset.

81. A reactor trip and turbine trip occurs while at 25% power.

Which ONE of the following describes the response of the Steam Dump system?

- a. Load rejection arms Steam Dump valves;
Tavg will be reduced to no-load Tavg.
- b. Load rejection arms Steam Dump valves;
Tavg will be reduced to within 5°F of Tref.
- c. Reactor trip arms Steam Dump valves;
Tavg will be reduced to no-load Tavg.
- d. Reactor trip arms Steam Dump valves;
Tavg will be reduced to within 5°F of Tref.

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82. Given the following plant conditions:

- Unit 1 at 20% RTP
- Turbine trip occurs without a Reactor trip.

- The Steam Dump System is in T-avg Mode.
- Rod Control is in Automatic

Which ONE of the following describes the effect of the Turbine trip on the Steam Dump and the Rod Control Systems? Assume no operator actions.

- a. The Steam Dump System will maintain T-avg at 562° F with all Control Rods fully inserted.
- b. The Steam Dump System will maintain T-avg at 557° F with all Control Rods fully inserted.
- c. The Steam Dump System will maintain T-avg at 562° F with Control Rods maintaining ≈15% Reactor power due to C-5.
- d. The Steam Dump System will maintain T-avg at 557° F with Control Rods maintaining ≈15% Reactor power due to C-5.

83. Which ONE of the following describes the source of instrument air and the effect of a loss of instrument air on the Main Steam Isolation Valves (MSIVs)?

- a. Non-essential air; MSIVs fail CLOSED.
- b. Non-essential air; MSIVs fail OPEN.
- c. Essential air; MSIVs fail CLOSED.
- d. Essential air; MSIVs fail OPEN.

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84. Given the following plant conditions:

- A large break LOCA has occurred.
- The operating crew has entered the EOPs and is currently implementing E-0, "Reactor Trip or Safety Injection".

Which ONE of the following describes when a crew brief should be held?

- a. After step 4 of E-0 is complete.
- b. After step 11 of E-0 is complete.
- c. Upon transitioning from E-0.
- d. Upon making the Emergency Classification

85. Given the following plant conditions:

- Unit at 100% RTP
- A S/G #1 safety valve begins leaking and power increases to 105% RTP.
- The crew enters AOI-38 and reduces turbine load to 90% with the valve position limiter.
- This load reduction caused reactor power to decrease to 95% RTP.

Which ONE of the following would be the correct crew response per AOI-38 if the flow increased through the leaking safety valve causing the reactor power to return to 101%?

- a. Decrease turbine load at 5%/min to reduce reactor power to <100% and continue AOI 38.
- b. Use the valve position limiter to maintain power <100% and continue AOI-38.
- c. Trip the reactor, close the MSIVs and bypasses, and go to E-0.
- d. Trip the reactor, initiate SI, close the MSIVs and bypasses and go to E-0.

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86. Given the following conditions:

- Plant was operating at 100% power when a Main Feedwater pump tripped causing a plant runback.
- The OAC observes AFD to be outside the "doghouse" on PRM channels N41, and N44.

Which ONE of the following identifies the action required to comply with Technical Specifications?

- a. Restore AFD to within limits AND Reduce power to < 50% within 30 minutes.
- b. Restore AFD to within limits AND Reduce power to < 50% within 15 minutes.
- c. Restore AFD to within limits OR Reduce power to < 50% within 30 minutes.
- d. Restore AFD to within limits OR Reduce power to < 50% within 15 minutes.

87. Given the following conditions:

- Plant is at 100% power.
- RCS pressure is 2235 psig and T-avg is 588°F.
- RHR discharge relief valve 1-63-637 is leaking to the PRT at a rate of 2.5 gpm.

Which ONE of the following describes the type of leakage and the action required by Technical Specifications? (Assume all other systems are operating normally and no other RCS leakage)

- a. Unidentified leakage that requires shutdown.
- b. Pressure boundary leakage that requires shutdown.
- c. Identified leakage, but does not require shutdown.
- d. Controlled leakage, but does not require shutdown.

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88. Given the following plant conditions:

- Plant is in Mode 3
- During performance of Control Building routine rounds the AUO discovers the 125V DC supply breaker to 120V AC Vital Inverter 1-II in the TRIPPED position.

Which ONE of the following describes the correct action which must be taken with regard to Tech Specs?

- a. Attempt to close the supply breaker one time, if the breaker can be closed, Tech Spec LCO action entry is NOT required.
- b. The Tech Spec LCO action for the inverter must be entered until the breaker can be closed.
- c. If the inverter is aligned to it's AC supply and the voltage is normal, Tech Spec LCO action entry is NOT required.
- d. If the inverter is aligned to it's AC supply and the voltage is normal, enter the appropriate Tech Spec LCO action for the inverter for tracking only until the breaker can be closed.

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89. Given the following plant conditions:

- Plant is in Mode 3 with startup in progress.
- The breaker for "C" hotwell pump will not close.
- The Shift Manager and Work Week Manager determined that trouble shooting could be conducted as "minor work" if the pump is tagged out.

Which ONE of the following describes how this trouble shooting activity should be documented?

- a. WO is NOT required since only trouble shooting is planned and will have no operational impact, no detailed planning or documentation is required.
- b. WO is NOT required since a PER will be written to address the condition adverse to quality and trouble shooting may be documented in the PER.
- c. WO is required, the WO may be sent directly to the craft after OPS approval and the work may be documented on the WO form.
- d. WO is required, the WO must be routed to planning after OPS approval and the work will be conducted and documented in the work package developed by the planner.

90. Given the following plant conditions:

- Unit is in Mode 3 with cooldown to Cold Shutdown in progress.
- A transient occurred resulted in the pressurizer going solid and RCS pressure increasing to 2835 psig.

Which ONE of the following actions is required?

- a. Be in hot shutdown with RCS pressure within its limit in 1 hour.
- b. Be in hot shutdown with RCS pressure within its limit in 30 minutes.
- c. Reduce RCS pressure to within its limit within 15 minutes.
- d. Reduce RCS pressure to within its limit within 5 minutes.

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91. Given the following plant conditions:

- Unit is operating at 100% power.
- Pressure channel II, 1-PT-68-335, has failed HIGH.
- All required actions for this instrument failure have been completed.
- The surveillance for Pressurizer pressure channel IV, 1-PT-68-322, will become late at the end of this shift.

Which ONE of the following actions should be taken?

- a. Apply Tech Spec SR 3.0.3 to extend the surveillance for 24 hours to allow completion of maintenance on 1-PT-68-335.
- b. Bypass the bistables on 1-PT-68-322, enter LCO 3.0.3 and then perform surveillance on 1-PT-68-322.
- c. Bypass the bistables on 1-PT-68-335 and then allow surveillance to be performed on 1-PT-68-322.
- d. Do not allow surveillance to be performed and enter Tech Spec 3.0.3 when the surveillance period expires.

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92. Given the following plant conditions:

- Unit is in Mode 6.
- Refueling operations are in progress.
- An irradiated fuel assembly cannot be placed in its specified core location.

Which ONE of the following describes an approved location for the fuel assembly per FHI-7, Fuel Handling and Movement?

- a. Fuel assembly can be placed in the New Fuel Elevator, but the elevator must be full down with power removed.
- b. Fuel assembly may be placed in a free-standing core location as long as no other fuel assembly is free-standing.
- c. Fuel assembly must be returned to the SFP until an alternate core location is determined.
- d. Fuel assembly may be temporarily stored in the RCCA change fixture.

93. The following conditions are encountered after a survey of a pump room in the Auxiliary building:

- | | |
|--|---|
| - General area radiation level in the room | 70 mrem/hr |
| - Radiation level 30 cm from the pump casing | 350 mrem/hr |
| - Contamination levels | 800 dpm/100cm ² beta
0 dpm/100cm ² alpha |

Which ONE of the following identifies the correct radiological postings required to reflect current radiological conditions for this room?

- a. Radiation Area.
- b. High Radiation Area.
- c. Radiation Area; Contamination Area.
- d. High Radiation Area; Contamination Area.

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94. Given the following plant conditions:

- A LOCA has occurred and a SAE has been declared.
- The TSC and OSC have been activated.
- To prevent core damage it is recommended that entry be made into Safety Injection Pump Room 1A.
- Projected dose rate in the pump room is 1.16×10^5 mr/hr.
- Duration of the exposure is expected to be 3 minutes.

Which ONE of the following must authorize this exposure?

- a. Radcon Manager
- b. Site Emergency Director
- c. Plant Manager
- d. Site Vice President

95. Given the following plant conditions:

- Unit is operating at 100% power.
- A release of the Monitor Tank to Cooling Tower Blowdown is planned.
- 1-RM-90-122, Liquid Radwaste Effluent Monitor is inoperable.

Which ONE of the following identifies the requirements to make the planned release under these conditions?

- a. No release can be made until 1-RM-90-122 is returned to service.
- b. Sample results must show that activity of the release liquid is $< 2 \times 10^{-4}$ microcuries per milliliter.
- c. Two separate samples must be analyzed and two independent qualified members of facility staff verify release rate and discharge valve lineup.
- d. The tank must be recirculated for two volumes and a licensed Senior Reactor Operator must confirm release rate and discharge valve lineup.

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96. Which ONE of the following identifies the first radiation monitor that should respond to a SGTR and the effect on the monitor?
- a. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will be automatically isolated.
 - b. Condenser Vacuum Exhaust Monitor RM-90-119 and the monitor will NOT be automatically isolated.
 - c. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will be automatically isolated.
 - d. Steam Generator Blowdown Sample Monitor RM-90-120/121 and the monitor will NOT be automatically isolated.

97. Given the following conditions:

- Unit 1 in MODE 1 at 10% RTP.
- Turbine at 1800 rpm at no load (generator PCB open).
- Loss of offsite power occurs.
- Emergency Diesels fails to re-energize Shutdown Boards.

Which ONE of the following describes the correct usage of the Emergency Instructions?

- a. Go directly to ECA-0.0 without entering E-0.
- b. Implement ECA-0.0 in conjunction with E-0.
- c. Go to ECA-0.0 from E-0 after verifying reactor and turbine trip.
- d. Complete E-0 IMMEDIATE ACTIONS then go immediately to ECA-0.0.

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98. Given the following plant conditions:

- Reactor trip and SI have occurred.
- Operators are using E-3, "Steam Generator Tube Rupture", to mitigate the event.

Which ONE of the following correctly describes the applicability of the low RCS pressure RCP trip criteria on the Foldout Page while performing steps of E-3?

- a. RCPs should be tripped during the performance of E-3 ANY TIME the foldout page low pressure RCP trip criteria are met.
- b. Low RCS pressure RCP trip criteria is not applicable in E-3 EXCEPT as an RNO if excessive RCS inventory loss is also experienced.
- c. RCPs should be tripped during E-3 ONLY if the low RCS pressure RCP trip criteria is met before beginning the cooldown and depressurization.
- d. RCPs should be tripped during E-3 ONLY if the low RCS pressure RCP trip criteria is met during the performance of step 1 when the operator is specifically required to check the criteria.

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99. A step in ES-1.3, "Transfer to RHR Containment Sump", reads as follows:

ISOLATE SI pump miniflow:

- CLOSE FCV-63-3.
- CLOSE FCV-63-175.
- CLOSE FCV-63-4.

The bullets ("•") indicate that:

- a. The actions must be performed in the specified sequence, but once a step is in progress, the next step may be started.
- b. The actions must be performed and completed in the specified sequence.
- c. These actions should have been completed, so only verification may be required.
- d. These actions must all be completed, but any sequence of completion is allowed.

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100. Following Safety Injection reset during ES-1.1 the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PZR heater status the OAC would observe?

- a. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- b. Control group 1D ON.
Backup group 1C OFF.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- c. Control group 1D OFF.
Backup group 1C ON.
Backup group 1A-A OFF.
Backup group 1B-B OFF.
- d. Control group 1D OFF.
Backup group 1C OFF.
Backup group 1A-A ON.
Backup group 1B-B ON.