

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

**Applicant Information**

<b>Name:</b>	<b>Region I</b>
<b>Date:</b>	<b>Facility/Unit: Three Mile Island</b>
<b>License Level: RO</b>	<b>Reactor Type: B&amp;W</b>
<b>Start Time:</b>	<b>Finish Time:</b>

**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	100 Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Points

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June 2000**

**Q 001**

**Q 001**

**Point Value: 1**

Sequence of events:

- Plant STARTUP in progress (4 RCPs operating).
- Power escalation stopped at 69% reactor power.
  - Group 7 Rod #1 mechanically stuck, 10 inches below the rest of Group 7.
  - Group 7 Absolute Group Average position indication = 55% withdrawn.
- 90 minutes later:
  - Rod #1 is unstuck, withdrawn and re-aligned with remaining Group 7 rods.
  - Power escalation to 100% is resumed at 30% per hour.

Identify the ONE (1) statement below that describes IF and WHY the above actions are procedurally ACCEPTABLE or UNACCEPTABLE in accordance with EP 1202-8, CRD Equipment Failure.

- A. Actions are ACCEPTABLE; adverse power peaking will not occur - the stuck rod was re-aligned with its group within two (2) hours.
- B. Actions are ACCEPTABLE; adverse power peaking will not occur - the stuck rod was re-aligned with its group while the group was less than 60% withdrawn.
- C. Actions are UNACCEPTABLE; adverse power peaking could occur - the rate of power escalation was too rapid after the stuck rod was re-aligned with its group.
- D. Actions are UNACCEPTABLE; adverse power peaking could occur - the stuck rod was (withdrawn) re-aligned with Group 7 with reactor power greater than 60%.

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**Q 002**

**Q 002**

**Point Value: 1**

RC-P-1A has been secured due to a #1 seal failure. It is desired to continue operating at 65% power.

Which ONE of the following is closest to the expected core delta-T for this power level?

- A. 22.4
- B. 29.9
- C. 34.5
- D. 39.9

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**Q 003**

**Q 003**

**Point Value: 1**

A Natural Circulation Cooldown was in progress when the following sequence of events occurred:

- MS-V-4A failed open
- cooldown rate increased to 120°F/hour
- Pressurizer level increased from 100" to 250" within a few seconds
- MS-V-4A was taken under manual control
- cooldown rate was reduced to 40°F/hour

Which ONE (1) of the following are the proper actions to take following this sequence of events?

- A. Stop the cooldown and maintain RCS temperature constant.  
Maintain RCS pressure at the current value or slightly higher.
- B. Stop the cooldown and maintain RCS temperature constant.  
Continue RCS depressurization within the Natural Circulation Pressure-Temperature Limits curve.
- C. Continue cooldown at less than 50°F/hour.  
Maintain RCS pressure at the current value or slightly higher.
- D. Continue cooldown at less than 50°F/hour.  
Continue RCS depressurization within the Natural Circulation Pressure-Temperature Limits curve.

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**Q 004**

**Q 004**

**Point Value: 1**

Identify the ONE (1) statement below which explains why it is extremely important to establish primary to secondary heat transfer during Small Break LOCAs.

- A. Voiding in the RCS will interrupt RCS flow which could result in excessive OTSG Tube to Shell delta-Ts and an OTSG tube rupture.
- B. Primary to Secondary heat transfer will prevent RCS void formation and allow continued Reactor Coolant Pump operation.
- C. If the break is at the HPI nozzle, insufficient HPI flow will be delivered to the core to maintain the core covered.
- D. The size of the break may be too small to pass sufficient flow to ensure adequate core cooling.

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**Q 005**

**Q 005**

**Point Value: 1**

Which ONE (1) of the following AUTOMATIC actions should occur if Control Rod Drive cooling water outlet temperature exceeds 160°F?

- A. MU-V-1A/B close
- B. MU-V-3 closes
- C. IC-V-1A/B close
- D. Standby IC-P-1 starts

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**Q 006**

**Q 006**

**Point Value: 1**

Which ONE of the following outlines the basic steps for transferring a Pressurizer Heater Group from the normal power supply to an engineered safeguards bus?

- A. Remove the disconnect device from the normal cabinet  
Open the normal supply breaker  
Install the disconnect device in the alternate cabinet  
Rack in the engineered safeguards bus breaker
- B. Open the normal supply breaker  
Remove the disconnect device from the normal cabinet  
Install the disconnect device in the alternate cabinet  
Rack in the engineered safeguards bus breaker
- C. Remove the disconnect device from the normal cabinet  
Install the disconnect device in the alternate cabinet  
Open the normal supply breaker  
Rack in the engineered safeguards bus breaker
- D. Open the normal supply breaker  
Remove the disconnect device from the normal cabinet  
Rack in the engineered safeguards bus breaker  
Install the disconnect device in the alternate cabinet

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**Q 007**

**Q 007**

**Point Value: 1**

The Control Room Supervisor directs stabilizing RCS pressure and T-cold on the "B" OTSG following a steam rupture on the "A" OTSG.

These actions are taken to prevent RCS heatup and repressurization in order to:

- A. prevent possible loss of subcooling margin due to insurge and cooling of the Pressurizer.
- B. minimize the formation of a reactor vessel head bubble due to the rapid cooldown
- C. prevent placing additional stresses on the Reactor Coolant System.
- D. minimize additional compressive stresses to the "A" OTSG tubes.

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**Q 008**

**Q 008**

**Point Value: 1**

Current plant conditions:

- Reactor is operating at 100% power.
- 6 CW Pumps are operating.
- Winter conditions exist.

Which ONE (1) statement describes when the CRO is required to manually trip the turbine? Assume no automatic reactor trip.

- A. Loss of one CW Pump.
- B. Condenser pressure is 8.7 inches Hg absolute.
- C. Loss of the Gland Steam Exhauster.
- D. Condenser pressure is 7.7 inches Hg absolute.

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**Q 009**

**Point Value: 1**

**Q 009**

The following plant conditions exist:

- Substation Panel (SS-1) 230 KV bus meters indicate zero volts
- Main Generator Output Breakers are open

Which ONE (1) of the following is a required operator action?

- A. Restore normal makeup and seal injection.
- B. Control MS-V-4A/B from the backup loaders.
- C. Start the Generator DC emergency seal oil pump.
- D. Provide the EF-V-30s a Local Auto setpoint of 50%.

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**Q 010**

**Q 010**

**Point Value: 1**

Based on expected plant response, identify the ONE (1) event below that would result in AUTOMATIC isolation of the Nuclear Service Closed Cooling Water to the Reactor Building.

- A. Large Break LOCA at the discharge of RC-P-1D.
- B. Inadvertent train "B" 4 psig ESAS actuation signal.
- C. Loss of Nuclear Service River Water cooling system.
- D. Pipe rupture on the NS supply header to the RCP coolers

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**Q 011**

**Point Value: 1**

**Q 011**

Current plant conditions:

- Numerous fire alarms are actuated on panels HVB, PLA, and PLB.
- Fire dampers AH-D-4 and AH-D-5 have automatically closed.
- Air tunnel deluge systems have actuated.
- Air tunnel halon system has actuated.
- Aux and Fuel Handling Building ventilation supply fans have tripped.

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

- A. Trip Aux and Fuel Handling Building ventilation exhaust fans.
- B. Actuate Relay Room CO2 system manually.
- C. Start three fire pumps.
- D. Trip the reactor.

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**Q 012**

**Q 012**

**Point Value: 1**

The Control Room has been evacuated and you are stationed at the Remote Shutdown Panels.

Which ONE of the following sets of controls are available at the Remote Shutdown Panels to control OTSG level and pressure?

- A. EF-V-30A and B only  
MS-V4A and B
- B. EF-V-30C and D only  
MS-V-3A through F
- C. EF-V-30A, B, C and D  
MS-V-4A and B
- D. EF-V-30A, B, C and D  
MS-V-3A through F

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**Q 013**

**Q 013**

**Point Value: 1**

Which ONE (1) of the following would constitute a loss of containment integrity during refueling operations?

- A. Reactor Building purge in progress.
- B. An open penetration is sealed with fire foam.
- C. One airlock door on the personnel hatch open.
- D. The equipment hatch is secured with four (4) bolts.

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**Q 014**

**Q 014**

**Point Value: 1**

A reactor trip has occurred and the crew is verifying the immediate actions of ATP 1210-1, Reactor Trip.

The following plant conditions exist five (5) minutes post-trip:

- |                 |            |          |
|-----------------|------------|----------|
| - RCS Pressure  | 1900 psig  |          |
|                 | Loop "A"   | Loop "B" |
| - RCS Thot      | 590°F      | 591°F    |
| - RCS Tcold     | 587°F      | 586°F    |
| - OTSG Pressure | 1010 psig  | 750 psig |
| - OTSG Level    | 11"        | 12"      |
| - RM-A-5        | 4.79E4 cps |          |
| - RM-A-15       | 3.62E4 cps |          |

Which ONE of the following ATOG procedures should the crew GO TO?

- A. ATP 1210-2, Loss of 25°F Subcooled Margin
- B. ATP 1210-3, Excessive Primary to Secondary Heat Transfer
- C. ATP 1210-4, Lack of Primary to Secondary Heat Transfer
- D. ATP 1210-5, OTSG Tube Leakage

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**Q 015**

**Q 015**

**Point Value: 1**

The plant announcement in the IMA section of 1202-11, "High Activity in Reactor Coolant", ensures that:

- A. personnel man required stations for plant shutdown.
- B. personnel leave the controlled area to minimize exposure.
- C. chemistry bypasses the RM-G-18 interlock for CA-V-1,2,3 and 13.
- D. the primary AO takes action to open MU-V-2A/B to restore inventory control.

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**Q 016**

**Point Value: 1**

**Q 016**

Plant conditions:

- Reactor Power is 100%.
- The following ICS Stations are in HAND due to a BTU Limit modification in progress:

FW-P-1A, FW-P-1B

FW-V-16A, FW-V-16B

FW-V-17A, FW-V-17B

MAP alarm H-1-2, OTSG A BTU LIMIT, is actuated

MAP alarm H-1-3, OTSG B BTU LIMIT, is actuated

- All other ICS stations are in AUTOMATIC

A Loss of ICS HAND Power occurs.

Identify the ONE (1) statement below that describes required operator action(s) for this situation.

- A. Stabilize reactor power to match Main Feedwater flow.
- B. Trip the Reactor, Turbine and both Main Feedwater Pumps.
- C. Place both Feedwater Pumps and all Feedwater Valves into ICS Auto.
- D. Transfer both Feedwater Pumps to the Motor Speed Changers in the Control Room.

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**Q 017**

**Q 017**

**Point Value: 1**

The plant is at 100% power.

The following plant conditions exist:

- Reactor Protection System surveillance in progress on "C" RPS cabinet.
- "C" RPS cabinet's associated CRD breakers/electronic trips were tripped
- An AO has manually reclosed "C" RPS cabinets associated DC breakers
- The Fault Reset pushbutton has NOT been pushed on the CRD Diamond panel

If a loss of Vital Bus "D" were to occur at this time, which ONE of the following would be the immediate effect?

- A. CRD Groups 1 and 3 would drop
- B. CRD Groups 1, 2, 3 and 4 would drop
- C. CRD Groups 5, 6 and 7 would drop
- D. CRD Groups 1 through 7 would drop

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**Q 018**

**Point Value: 1**

**Q 018**

A reactor trip occurred during performance of maintenance on the RPS cabinets. Performance of ATP 1210-1 is in progress and the following plant conditions exist:

- RCS pressure is 1800 psig and decreasing at 50 psig every 2 minutes
- OTSG A SU level is 40 inches and decreasing at 2 inches per minute
- OTSG B OP level is 95% and rising at 5% per minute
- Makeup flow is 350 gpm
- Pressurizer level is 80 inches and dropping 3 inches per minute
- SCM is 32 degrees F and dropping 1 degree per minute
- MUT level is 78 inches and dropping 10 inches per minute

Which ONE of the following identifies the most immediate operator action required for these conditions?

- A. Trip all RCPs
- B. Trip both MFW pumps
- C. Initiate both trains of HPI
- D. Open MU-V-14A or MU-V-14B, BWST suction to the MUPs

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**Q 019**

**Q 019**

**Point Value: 1**

Initial conditions:

- Plant at 80% power during a power escalation.
- Rod index is 275
- FW-P-1A and FW-P-1B in operation

The following sequence of events occurred:

- Loss of FW-P-1A
- Runback initiated in response to the loss of FW-P-1A
- 3 seconds after the runback initiated, a rod in Group 5 drops to the bottom of the core.

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

- A. Runback continues at 30% per minute to 482 MWd
- B. Runback continues at 30% per minute to 585 MWd
- C. Runback continues at 50% per minute to 482 MWd
- D. Runback continues at 50% per minute to 585 MWd

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**Q 020**

**Q 020**

**Point Value: 1**

Which ONE (1) of the following is the reason for the Anticipatory Reactor Trip on a Turbine Trip above 45% power?

- A. Prevent challenges to the PORV due to RCS pressure increase.
- B. Prevent excessive core outlet temperatures due to the RCS heatup.
- C. This is the maximum capacity of the Main Steam Safety Valves.
- D. This is the maximum capacity of the Turbine Bypass and Atmospheric Dump Valves.

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**Q 021**

**Point Value: 1**

**Q 021**

The following plant conditions exist:

- Small Break LOCA cooldown in progress
- cooldown rate is 30°F per hour
- incore thermocouple temperature is 456°F

ATP 1210-6, Small Break LOCA Cooldown, requires you to "Maintain OTSG pressure so that secondary T-sat is 40 to 60°F lower than incore thermocouple temperature."

Which ONE (1) of the following would be the correct OTSG pressure to accomplish this step?

- A. 255 psig
- B. 295 psig
- C. 435 psig
- D. 685 psig

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**Q 022**

**Q 022**

**Point Value: 1**

A Small Break LOCA Cooldown is in progress in accordance with ATP 1210-6.

The following plant conditions exist:

- all four (4) Reactor Coolant Pumps are secured
- RCS pressure is 385 psig and stable
- both OTSG levels are 63% and being raised to 75 - 85%
- both OTSG pressures are approximately 145 psig and stable
- both T-hots are approximately 440°F
- both T-colds are approximately 400°F
- the five highest incore thermocouples average 490°F

Which ONE (1) of the following procedure transitions should take place?

- A. Go To ATP 1210-4, Lack of Primary to Secondary Heat Transfer.
- B. Go To ATP 1210-7, Large Break LOCA Cooldown.
- C. Go To ATP 1210-8, RCS Superheated.
- D. Go To ATP 1210-9, HPI Cooling - Recovery from Solid Operations.

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**Q 023**

**Q 023**

**Point Value: 1**

Current plant conditions:

- The plant is in Refueling Shutdown
- "A" train Decay Heat Removal is in service
- The Reactor Coolant System is being drained down for RV Head removal
- The "B" train Decay Heat Removal is being lined up for operation

Which ONE of the following would be a reason for DH-P-1B developing fluctuating motor amps when it is started?

- A. DH-V-4B closed
- B. DH-V-5B closed
- C. DH-V-12B closed
- D. DH-V-38B closed

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**Q 024**

**Q 024**

**Point Value: 1**

Plant conditions:

- ATWS in progress
- The primary CRO depresses the Manual Reactor Trip pushbutton.

Which ONE (1) of the following sets of conditions would positively ensure that the operator's action was successful AND that ALL CRDMs had power removed?

- A. RPS Breaker Trip Lights on ALL 4 RPS Cabinets are bright.
- B. RPS Protective Subsystem Lights on ALL 4 RPS Cabinets are bright.
- C. All IN-LIMIT lamps on the Diamond Control Panel for Groups 1-7 drop are lit.
- D. Alarms G-1-3 (CRD DC Trip Brkr Open) AND G-1-4 (CRD AC Trip Brkr Open) actuate.

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**Q 025**

**Q 025**

**Point Value: 1**

Plant startup is in progress. Source Range channels indicate 100 cps. Group 5 rods are being withdrawn from 75% to 100% when Source Range Channel NI-11 fails low.

Based on this condition, the startup:

- A. Should be terminated AND verify the core is 1% deltaK/K shutdown.
- B. Should be terminated AND Group 5 rods fully inserted.
- C. May continue provided NI-12 is operational.
- D. May continue provided NI-3 is operational.

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**Q 026**

**Q 026**

**Point Value: 1**

The compensating voltage power supply for NI-3 fails to zero voltage output. In comparison with NI-4, which is operating properly, NI-3 will read

- A. significantly higher during startup, and have negligible error at 100% power.
- B. significantly lower during startup, and have negligible error at 100% power.
- C. significantly higher from startup through 100% power.
- D. significantly lower from startup through 100% power.

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**Q 027**

**Q 027**

**Point Value: 1**

The crew has taken action to minimize subcooling margin in accordance with ATP 1210-5, OTSG Tube Leakage. Identify the ONE (1) statement below that describes the reason for minimizing subcooling margin in this situation.

- A. Minimize the differential pressure between the OTSG and RCS.
- B. Minimize time required for cooldown of the RCS.
- C. Minimize potential of lifting Main Steam safety valves.
- D. Minimize tensile stresses on affected OTSG tubes.

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**Q 028**

**Point Value: 1**

**Q 028**

The following plant conditions exist:

- Cooling down after a "A" Steam Generator Tube Leak
- RCS pressure 985 psig
- RCS temperature 530°F
- All four Reactor Coolant Pumps operating
- 75°F/hour cooldown rate

Which ONE of the following actions should be taken:

- A. Reduce cooldown rate to 50°F/hour or less
- B. Increase cooldown rate toward 240°F/hour
- C. Secure one Reactor Coolant Pump in each loop
- D. Secure all four Reactor Coolant Pumps

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**Q 029**

**Q 029**

**Point Value: 1**

Plant conditions:

- Time is ten minutes after reactor trip due to loss of both Main Feedwater Pumps.
- EF-P-2A is operating, EF-P-1 and EF-P-2B are not operating.
- T-hot is 585° F and slowly increasing.
- RCS pressure is 2300 psig and slowly increasing.
- All RCPs are operating.
- OTSG 1A level is 25 inches.
- OTSG 1B level is 0 inches.
- OTSG 1A pressure is stable at 1010 psig.
- OTSG 1B pressure is 800 psig and decreasing.
- RCS heat up rate is +75° F/Hr.

From the list below, identify the ONE (1) required action concerning operation of the Reactor Coolant Pumps.

- A. Stop 1 RCP per loop.
- B. Stop 3 RCPs.
- C. Stop 4 RCPs.
- D. Continue to operate 4 RCPs.

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**Q 030**

**Point Value: 1**

**Q 030**

The following alarms, among others, are received simultaneously:

- A-1-7 Battery 1A Discharging
- A-2-7 Batt Charger 1A/1C/1E Trouble
- A-3-7 Inverter 1A/1C/1E System Trouble
- PRF1-1-1 CRDM Breaker Test Trouble
- NN-3-1 230 KV Substation Trouble
- AA-3-2 7KV Bus Trouble
- AA-3-3 4KV BOP Bus Trouble
- AA-3-5 480V BOP Bus Trouble

Which ONE (1) of the following events would result in ALL of the above indications?

- A. Loss of "A" DC Distribution
- B. Loss of the A/C/E Inverters
- C. Loss of "A" Battery Charger
- D. Loss of "A" Aux Transformer

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**Q 031**

**Q 031**

**Point Value: 1**

The RCDT is being pumped down when RM-G-20, (RC Drain Pump Discharge Monitor) High Alarm actuates.

From the list below, identify which ONE (1) of the following automatic actions will occur as a result of this event.

- A. WDL-V-534 AND WD-L-535 CLOSE
- B. WDG-V-3 AND WDG-V-4 CLOSE
- C. CA-V-4B AND CA-V-5B CLOSE
- D. CA-V-2 AND CA-V-13 CLOSE

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**Q 032**

**Q 032**

**Point Value: 1**

During a waste gas release, which ONE (1) of the following provides protection against an accidental gas release?

- A. The inlet valves are interlocked to prevent adding additional gas to a tank that is releasing.
- B. The gas release will terminate if the tank outlet flow monitor falls below setpoint.
- C. The outlet valves are interlocked to prevent opening more than one at a time.
- D. The gas release will terminate if the Aux Building supply fan trips.

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**Q 033**

**Q 033**

**Point Value: 1**

Which ONE (1) of the following is NOT a method of evaluating whether a Radiation Monitoring System channel is operating properly?

- A. Comparing the meter reading with the recorder trace.
- B. Comparing the meter reading with the Plant Process Computer point.
- C. The meter indication is on-scale without the check source.
- D. Obtaining a meter reading increase when performing a source check.

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**Q 034**

**Point Value: 1**

**Q 034**

The plant is at 100% power with ICS in full automatic operation.

The following plant conditions exist:

- Pressurizer level 200" and decreasing about 4" per minute
- Makeup Tank level 80" and decreasing about 2" per minute
- Makeup flow 60 gpm and increasing slowly
- MU-V-17 demand at 50% and increasing slowly

Which ONE of the following failures would explain the conditions above?

- A. MU-V-5 is failing open
- B. MU-V-17 is failing open
- C. Seal Injection flow instrument is failing low
- D. Pressurizer level instrument is failing low

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**Q 035**

**Q 035**

**Point Value: 1**

The following plant conditions exist:

- The plant is shutdown for refueling.
- Fuel transfer operations are in progress from the SFP to the Reactor Building
- Spent fuel cooling is in operation.

Which ONE (1) of the following would require entry into AP 1202-43, Transfer Canal Seal Plate Gasket Failure/Level Loss?

- A. Observed leakage from primary shield penetrations.
- B. A fuel assembly is dropped and dents the bottom of the Spent Fuel Pool.
- C. Nuclear Service Closed Cooling surge tank is rising at 1 inch per minute.
- D. RB pressure less than fuel handling building pressure when opening FH-V-1A/B.

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**Q 036**

**Q 036**

**Point Value: 1**

The plant has experienced a simultaneous Loss of Offsite Power and ESAS actuation.

Which ONE (1) statement below identifies the start times for the affected loads AND the reason for block loading?

- A. MU-P-1A starts immediately; DC-P-1A starts 10 seconds later to ensure large loads are energized first.
- B. DH-P-1A starts immediately; RR-P-1A starts 10 seconds later to ensure large loads are energized first.
- C. MU-P-1A starts immediately; RR-P-1A starts 10 seconds later to prevent overloading the EDG.
- D. DH-P-1A starts immediately; DC-P-1A starts 10 seconds later to prevent overloading the EDG.

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**Q 037**

**Q 037**

**Point Value: 1**

The following data is obtained during an approach to criticality:

CRD Grp 5 Position	NI-11 Reading
0%	2.0 cps
25%	2.5 cps
50%	4.0 cps
75%	5.0 cps

Which ONE (1) of the following control rod positions is closest to where you would predict criticality?

- A. 15% on Group 6
- B. 40% on Group 6
- C. 50% on Group 6
- D. 95% on Group 6

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**Q 038**

**Q 038**

**Point Value: 1**

Calculate an Estimated Critical Rod Position (ECP) for the following plant conditions:

- 20 hours post trip
- Plant has been running at 100% power since initial cycle startup
- 400 EFPD
- 890 ppm Boron from RCS sample
- Boron correction factor of 0.98
- CRD Group 8 at 30%
- T-ave 532°F

Which ONE (1) of the following rod tolerance bands is the most correct for this ECP?

- | Minimum           | Maximum         |
|-------------------|-----------------|
| A. 72% on Group 5 | 55% on Group 7  |
| B. 11% on Group 6 | 73% on Group 7  |
| C. 29% on Group 6 | 47% on Group 7  |
| D. 30% on Group 7 | 100% on Group 7 |

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**Q 039**

**Point Value: 1**

**Q 039**

The following plant conditions exist:

- Reactor power is 70%
- 4 RCPs in operation
- ICS is in full AUTO
- High vibrations exist on RC-P-1B

Which ONE of the following describes the correct response of the feedwater system when RC-P-1B is secured?

- A. Feed flow to OTSG A increases  
Feed flow to OTSG B increases
- B. Feed flow to OTSG A increases  
Feed flow to OTSG B decreases
- C. Feed flow to OTSG A decreases  
Feed flow to OTSG B decreases
- D. Feed flow to OTSG A decreases  
Feed flow to OTSG B increases

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**Q 040**

**Q 040**

**Point Value: 1**

Which ONE (1) of the following sets of Reactor Coolant Pump motor temperatures would require a power reduction and trip of the affected pump?

RC-P-1A

Motor stator - 110°C  
Motor radial bearings - 170°F  
Motor thrust bearing - 185°F

RC-P-1B

Motor stator - 120°C  
Motor radial bearings - 190°F  
Motor thrust bearing - 180°F

RC-P-1C

Motor stator - 130°C  
Motor radial bearings - 150°F  
Motor thrust bearing - 175°F

RC-P-1D

Motor stator - 140°C  
Motor radial bearings - 170°F  
Motor thrust bearing - 170°F

- A. RC-P-1A
- B. RC-P-1B
- C. RC-P-1C
- D. RC-P-1D

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**Q 041**

**Point Value: 1**

**Q 041**

Initial Conditions:

- Plant is at 100% power
- All ICS H/A stations are in AUTO

Which ONE (1) of the following condition(s) would exist on the loss of bus ATA?

- A. MU-V-5 controller fails to the mid position
- B. FW-V-17A/B controller fails to mid position.
- C. Pressurizer heater control fails to 50% demand.
- D. MS-V-4A/B control transfers to the Back-up Loaders.

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**Q 042**

**Point Value: 1**

**Q 042**

The following conditions exist:

- Reactor is at 10e-8 amps and stable
- RCS boron concentration is at 950 ppm
- 'A' RCBT boron concentration is at 12 ppm
- 'B' RCBT boron concentration is at 945 ppm
- 'C' RCBT boron concentration is at 1400 ppm

Makeup is initiated to raise level in MU-T-1. Two minutes later, the following indications are observed:

- NI-3 and NI-4 indicate a 0.1 DPM startup rate
- NI-3 and NI-4 level indication is rising

Which ONE (1) of the following would result in the above plant response?

- A. Makeup from the BWST.
- B. Makeup from the 'A' RCBT
- C. Makeup from the 'B' RCBT
- D. Makeup from the 'C' RCBT

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**Q 043**

**Point Value: 1**

**Q 043**

The following plant conditions exist:

- The plant is at 100% power.
- An inadvertent "B" train 30# ESAS actuation has occurred
- The "B" train 30# ESAS actuation cannot be reset

Which ONE of the following are the direct consequences of this ESAS actuation?

- A. High Reactor Coolant Pump Seal temperatures  
High Control Rod Drive Stator temperatures
- B. High Reactor Coolant Pump Seal temperatures  
Loss of Reactor Coolant Pump Seal Injection
- C. High Reactor Coolant Pump Motor temperatures  
High Control Rod Drive Stator temperatures
- D. High Reactor Coolant Pump Motor temperatures  
Loss of Reactor Coolant Pump Seal Injection

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**Q 044**

**Q 044**

**Point Value: 1**

Plant conditions:

- Reactor power is 60%, following response to an asymmetric (dropped) rod in Group 5.
- Reactor power channel SASS mismatch is present due to the dropped rod.
- All ICS stations are in AUTO.
- NI-5 is selected for ICS control.

With no operator action, from the list below identify the ONE (1) set of events that will initially result if NI-5 output fails to 0%.

- A. Control rods will NOT insert/withdraw, AND feedwater flow will DECREASE.
- B. Control rods will NOT insert/withdraw, AND feedwater flow will NOT change.
- C. Control rods will WITHDRAW, AND feedwater flow will DECREASE.
- D. Control rods will WITHDRAW, AND feedwater flow will INCREASE.

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**Q 045**

**Q 045**

**Point Value: 1**

Plant conditions:

- Reactor power is 85% following a failure in ICS SG/Rx Master.
- ICS stations in HAND:
  - SG/Rx Master.
  - Reactor Demand.
  - BOTH FW Loop Masters.
- All other stations, including the Diamond Rod Control Panel, are in AUTO.
- Control rod index is 275%.

The reactor operator inserts Group 8 rods from 30% to 20% to adjust core power imbalance. This action adds positive reactivity to the core and causes an increase in reactor power.

From the list below identify the ONE (1) statement that describes Control Rod Group 7 response during the insertion of Group 8 rods under the conditions described above.

- A. Not move because neutron error will be zero (0).
- B. Not move because Group-8 is being inserted.
- C. Withdraw due to a positive ICS neutron error.
- D. Insert due to a negative ICS neutron error.

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**Q 046**

**Q 046**

**Point Value: 1**

The following plant conditions exist:

- a pressurizer temperature RTD develops an open circuit
- pressurizer differential pressure on the PPC (A0501) is 300"
- RCS pressure is 2155 psig and stable

Which ONE (1) of the following identifies the manner in which the temperature instrument fails AND what the actual pressurizer level is?

- A. low, 120"
- B. low, 208"
- C. high, 120"
- D. high, 208"

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**Q 047**

**Q 047**

**Point Value: 1**

Which ONE (1) statement does NOT satisfy the Superheat Determination/Limit Rule as defined in ATP-1210-10?

- A. 25° F of superheat as determined by the plant computer.
- B. 25° F of superheat as determined by the most conservative of the two subcooling margin meters on panel PCL.
- C. 25° F of superheat as determined by the average of 5 highest operable incore thermocouples and RCS wide range pressure.
- D. 25° F of superheat as determined by the highest operable BIRO incore thermocouple and RCS wide range pressure.

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**Q 048**

**Q 048**

**Point Value: 1**

Which ONE (1) of the following is the purpose of RR-V-6 throttling to maintain 60 psig back pressure when Reactor Building Emergency Cooling is in service?

- A. Ensure the RB coolers are full of water at their highest elevation.
- B. Ensure the RB cooling coils do not experience flow-induced vibration.
- C. Prevent runout of a single Reactor River pump if the second pump fails to start.
- D. Prevent radioactivity from reaching the river due to leakage in the RB cooling coils.

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**Q 049**

**Q 049**

**Point Value: 1**

A large steam leak has occurred, RB pressure is 15 psig.

From the list below, identify the ONE (1) indication in the Control Room that would indicate higher than the actual condition.

- A. SCM
- B. RB Sump Level
- C. Pressurizer Level
- D. RCS Pressure

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**Q 050**

**Q 050**

**Point Value: 1**

The following plant conditions exist:

- Reactor power 100%
- Condensate Booster pumps CO-P-2A and CO-P-2C are operating
- Feed Reg Valve demands are 52%

A shaft shear occurs on CO-P-2A.

Predict which ONE (1) of the following will be the INITIAL response to this condition.

- A. CO-P-2B starts automatically.
- B. FW to Rx Cross Limit will occur.
- C. Feed Reg Valve demands will decrease.
- D. Feed Pump discharge pressures increase.

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**Q 051**

**Point Value: 1**

**Q 051**

Initial plant conditions:

- Reactor power is 100%.
- CO-P-1A and CO-P-1B are running, CO-P-1C is in Normal-After-Stop.
- CO-P-2A and CO-P-2B are running, CO-P-2C is in Normal-After-Stop.
- CO-P-1B breaker trips on an electrical fault.
- After a period of two (2) seconds, CO-P-1C automatically starts.

From the list below, identify the ONE (1) statement that describes the plant response for these conditions.

- A. One condensate booster pump will trip, both main feed pumps remain running, with an ICS runback.
- B. One condensate booster pump and one main feed pump will trip, with an ICS runback.
- C. One main feed pump will trip, both condensate booster pumps remain running, with an ICS runback.
- D. Both main feed pumps trip, one condensate booster pump trips and the reactor trips.

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**Q 052**

**Point Value: 1**

**Q 052**

The following plant conditions exist:

- A loss of condenser vacuum has occurred.
- Both MFPs are tripped.
- EFW actuated
- OTSG pressures are 1005 psig and stable.
- The IMAs of 1210-1 have been completed.

Which ONE (1) of the following describes the status of the OTSGs?

Tensile stress will be:

- A. higher due to steaming through the ADVs.
- B. higher due to the loss of MFW.
- C. lower due to steaming through the ADVs.
- D. lower due to the loss of MFW.

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**Q 053**

**Q 053**

**Point Value: 1**

A plant power reduction is being performed in order to secure the "B" Main Feedwater Pump due to high vibration.

Which ONE (1) of the following conditions would represent the HIGHEST power level acceptable for securing FW-P-1A WITHOUT exceeding an ICS High Load Limit?

- A. Unit Load Demand at 65%
- B. Unit Load Demand at 45%
- C. Main Feedwater flow at 7.8 Mlbm/hr
- D. Main Feedwater flow at 6.2 Mlbm/hr

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**Q 054**

**Point Value: 1**

**Q 054**

The following sequence of events occurred:

- there was simultaneous loss of ICCW and the running Makeup pump
- the Reactor tripped automatically
- all three Emergency Feedwater pumps started
- EFW flow to "A" OTSG is 0 gpm
- EFW flow to "B" OTSG is 400 gpm

The following status indications are present above the EF-V-30 controllers for the "A" OTSG:

- AUTO light is illuminated
- SU light is illuminated
- OP light is not illuminated

Which ONE (1) of the following is the ONLY method which will allow the operator to control the correct level in the "A" OTSG?

- A. Place EF-V-30A and/or D controllers in Local Auto and dial in a 25% setpoint.
- B. Place EF-V-30A and/or D controllers in Local Auto and dial in a 50% setpoint.
- C. Place EF-V-30A and/or D controllers in Manual and control level manually at 25".
- D. Place EF-V-30A and/or D controllers in Manual and control level manually at 50%.

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**Q 055**

**Q 055**

**Point Value: 1**

The following plant conditions exist:

- Fifteen (15) minutes after a reactor trip from 100% power
- All four (4) Reactor Coolant Pumps are operating
- Emergency Feedwater was actuated on low OTSG levels
- "B" OTSG level is 55" and rising at 7" per minute
- EFW flow to "B" OTSG is 300 gpm and stable
- EF-V-30B and EF-V-30C controllers in the Control Room indicate 0 demand
- An AO reports that EF-V-30B is closed and EF-V-30C is 30% open

Which ONE (1) action below is required to gain control of "B" OTSG level?

- A. Secure EF-P-2A from the Control Room.
- B. Order the AO to manually close EF-V-52C.
- C. Order the AO to manually close EF-V-30C with the handwheel.
- D. Take manual control of EF-V-30C from the Control Room positioner.

**NRC CRO Licensing Examination  
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**Q 056**

**Q 056**

**Point Value: 1**

Plant Conditions:

- Reactor power is 100%.
- Liquid Release is in progress from A WECST.
- IWTS release is in progress.

A high alarm is received from RM-L-6 Radioactive Waste Water Discharge Monitor, however RM-L6 Enable/Defeat switch is in Defeat.

From the list below, identify the ONE (1) statement that describes required operator action(s) for this condition.

- A. Close IW-V-73, IWTS Effluent valve on the Control Room LWDS panel.
- B. Close WDL-V-257, Liquid Release Effluent Valve, on the Control Room LWDS panel.
- C. Place RM-L6 to Enable AND verify IW-V-73, IWTS Effluent valve, closes.
- D. Place RM-L6 to Enable AND verify WDL-V-257, Liquid Release Effluent Valve, closes.

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**Q 057**

**Q 057**

**Point Value: 1**

Waste Gas Decay Tank relief valve, WDG-V-36, has opened due to high tank pressure. This valve is now FAILED OPEN.

All the radiation monitors in the release pathway go into HIGH alarm.

From the list below, identify the ONE (1) statement that describes automatic action(s) initiated by the Radiation Monitoring system related to this accidental gaseous release.

- A. Trips AH-E-14A/C (B/D).
- B. Trips AH-E-10 AND AH-E-11.
- C. Trips AH-E-10 ONLY.
- D. Trips AH-E-11 ONLY.

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**Q 058**

**Point Value: 1**

**Q 058**

Which ONE (1) of the following explains the relationship between the dose rate from a POINT radiation source and the distance from that source?

- A. Dose rate is proportional to the change in distance.
- B. Dose rate is inversely proportional to the change in distance.
- C. Dose rate is proportional to the change in distance squared.
- D. Dose rate is inversely proportional to the change in distance squared.

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**Q 059**

**Q 059**

**Point Value: 1**

Which ONE (1) of the following will occur when RM-A-9G goes into HI alarm?

- A. WDG-V47 closes.
- B. WDL-V535 closes.
- C. AH-E-10 trips.
- D. AH-E-11 trips.

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**Q 060**

**Q 060**

**Point Value: 1**

Which ONE (1) of the following is the basis the Reactor Protection System Nuclear Overpower trip setpoint in Technical Specifications?

- A. To prevent excessive core outlet temperature in the operating range.
- B. To protect against a startup accident from low power or a slow rod withdrawal from high power.
- C. To accommodate the most severe thermal transient considered in the design, the loss-of-coolant flow accident from high power.
- D. To prevent damage to the fuel cladding from reactivity excursions too rapid to be detected by pressure and temperature measurements.

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**Q 061**

**Q 061**

**Point Value: 1**

The plant was at 100% power in normal alignment when the following sequence of events occurred:

- small break LOCA
- RB pressure rose to 10 psig and stabilized
- 1600#, 500# RCS pressure ESAS signals were bypassed
- 4# RB pressure ESAS signal was defeated
- the LOCA degraded to a large break
- RB pressure rose to 40 psig

Which ONE (1) of the following identifies the equipment operating in order to limit containment pressure and temperature?

- A. All three AH-E-1s in FAST speed.
- B. All three AH-E-1s in SLOW speed.
- C. All three AH-E-1s in FAST speed, AND both BS-P-1s.
- D. All three AH-E-1s in SLOW speed, AND both BS-P-1s.

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**Q 062**

**Q 062**

**Point Value: 1**

The following plant conditions currently exist:

- RCS pressure is 2125 psig and decreasing at 21 psig per minute
- Pressurizer temperature is 644°F and decreasing at 2.5°F per minute
- The Pressurizer Spray Valve (RC-V-1) has NO indication
- The PORV (RC-RV-2) has a green demand indication
- There is no evidence of RCS leakage.
- No operator actions have been taken.

Which ONE (1) of the following automatic OR manual actions is REQUIRED to prevent a low RCS pressure reactor trip?

- A. Pressurizer Heater Bank 4 energizing at 2120 psig will mitigate the event.
- B. Pressurizer Heater Bank 5 energizing at 2105 psig will mitigate the event.
- C. The operator MUST close the Pressurizer Spray Block Valve (RC-V-3).
- D. The operator MUST close the PORV Block Valve (RC-V-2).

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**Q 063**

**Point Value: 1**

**Q 063**

A plant shutdown is started due to an RCS leak.

The following data is obtained for an RCS mass balance:

18:43

Pzr - 220"

MUT - 86"

Tavg - 579.2°F

18:53

Pzr - 200"

MUT - 70"

Tavg - 577.8°F

Which ONE (1) of the following is the approximate RCS leakrate?

- A. 23 gpm
- B. 59 gpm
- C. 66 gpm
- D. 85 gpm

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**Q 064**

**Q 064**

**Point Value: 1**

Which ONE (1) of the following sets of trips are ALL bypassed by the RPS cabinet Shutdown Bypass Key Switch?

- A. Power to Pumps  
Power/Imbalance/Flow  
Variable Pressure/Temperature
- B. Power/Imbalance/Flow  
Reactor Building Pressure  
Low Reactor Coolant Pressure
- C. Loss of 2 Main Feed Pumps  
Low Reactor Coolant Pressure  
Variable Pressure/Temperature
- D. Power to Pumps  
Low Reactor Coolant Pressure  
High Reactor Coolant Pressure

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**Q 065**

**Point Value: 1**

**Q 065**

During an approach to criticality, the following plant conditions exist:

- NI-11 and 12 indicate 150 cps
- NI-3 and 4 indicate  $1 \times 10^{-11}$  amps

Which ONE (1) of the following would occur if NI-4 Startup Rate fails high while the operator is withdrawing rods?

- A. Rod out motion would stop immediately.
- B. An out-inhibit would go into effect when NI-4 comes on scale.
- C. An out-inhibit would go into effect when the operator stops withdrawing rods.
- D. Rod out motion would not be affected unless either NI-11 or NI-12 indicated a high startup rate.

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**Q 066**

**Q 066**

**Point Value: 1**

Which ONE (1) of the following identifies the instrumentation that provides the pressure input used for control of the listed components?

- A. Turbine Bypass Valves - Turbine Header Pressure  
Atmospheric Dump Valves - Turbine Header Pressure
- B. Turbine Bypass Valves - Turbine Header Pressure  
Atmospheric Dump Valves - OTSG Outlet Pressure
- C. Turbine Bypass Valves - OTSG Outlet Pressure  
Atmospheric Dump Valves - Turbine Header Pressure
- D. Turbine Bypass Valves - OTSG Outlet Pressure  
Atmospheric Dump Valves - OTSG Outlet Pressure

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**Q 067**

**Q 067**

**Point Value: 1**

BS-P-1B is running for surveillance. Which ONE (1) condition would result in automatic trip of the BS-P-1B breaker?

- A. 1A Aux Transformer fault with Auto Transfer of loads to 1B Aux Transformer.
- B. 1B Aux Transformer fault with Auto Transfer of loads to 1A Aux Transformer.
- C. Fault downstream of 1P 480v Bus low side feeder breaker.
- D. Fault downstream of 1S 480v Bus low side feeder breaker.

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**Q 068**

**Q 068**

**Point Value: 1**

A RB purge was just initiated using AH-E-6A and AH-E-7A when AH-E-6A trips, resulting in the purge being secured automatically.

Which ONE (1) of the following actions is required in order to restore the purge?

Start AH-E-6B, then:

- A. open AH-V-1C/D.
- B. open AH-V-1A/B.
- C. open AH-V-1A/B AND restart AH-E-7A.
- D. open AH-V-1C/D AND restart AH-E-7A.

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**Q 069**

**Point Value: 1**

**Q 069**

Plant conditions:

- Reactor power is 100%.
- SF-P-1A Spent Fuel Cooling Pump is operating in recirc mode.
- SF-P-2 Borated Water Recirc Pump is operating for Pool A (LWDS) cleanup.
- Spent fuel assembly rack location change in progress in Spent Fuel Pool A.

Due to equipment failure, a spent fuel assembly is dropped – lying on top of the fuel racks in Pool A. Fuel pin clad rupture has resulted in significant activity release to the spent fuel pool water.

Identify the ONE (1) statement below that describes plant design response to RM-L-5 indication, which pegs high due to the increase in radioactivity described above.

- A. SF-P-2 trips.
- B. SF-P-1A trips.
- C. MAP C-1-1 RADIATION LEVEL HIGH actuates.
- D. MAP C-1-1 RADIATION LEVEL HIGH actuates AND Fuel Handling Building Supply Fan, AH-E-10, trips.

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**Q 070**

**Point Value: 1**

**Q 070**

The plant is at 40% power when the following events occur:

- A main steam line break occurs in the turbine building.
- The reactor is successfully tripped.
- Attempts to trip the turbine from the control room fail.
- Actions to isolate both OTSGs are initiated.
- MS-V-1A and MS-V-1C fail to close.
- All other OTSG isolation efforts are successful.

Which ONE (1) of the following conditions will occur?

- A. OTSG 'A' blows down completely. OTSG 'B' is isolated.
- B. OTSG 'B' blows down completely. OTSG 'A' is isolated.
- C. OTSGs 'A' and 'B' blow down until the turbine is tripped locally.
- D. OTSGs 'A' and 'B' blow down until generator output breakers trip on reverse power.

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**Q 071**

**Q 071**

**Point Value: 1**

Which ONE (1) of the following describes how Power Load Unbalance actuates the Combined Intercept Valves in order to prevent Main Turbine overspeed from the steam in the Moisture Separators?

- A. The Intercept Valves fast close and are released within one second.
- B. The Intercept Valves fast close and are released only when < 40% load mismatch.
- C. The Intercept Stop Valves fast close and are released within one second.
- D. The Intercept Stop Valves fast close and are released only when < 40% load mismatch.

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**Q 072**

**Point Value: 1**

**Q 072**

Plant conditions:

- Reactor tripped from 100% power.
- LOSS OF STATION POWER has occurred.
- Primary and secondary parameters are being maintained in the P-T Plot post trip stability windows.
- NO increase in RCS activity following trip.
- Mass balance calculations indicate the existence of 5 gpm RCS leakage.
- 1210-1 Immediate Actions are being performed.

Considering the conditions above, identify the ONE (1) instrument below that, if evaluated alone, would support a valid determination that OTSG tube leakage exists.

- A. RM-A-2 (RB Atmospheric Monitor).
- B. RM-A-5 (Condenser Off-Gas Monitor).
- C. RM-G-25 (Condenser Off-Gas Monitor).
- D. RM-G-26 (Main Steam Line Monitor).

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**Q 073**

**Point Value: 1**

**Q 073**

Plant conditions:

- 100% power
- NI-7 is failed high
- "C" RPS is in Manual Bypass

A problem with the Reactor Trip module in the "B" RPS cabinet requires pulling the module for trouble-shooting.

Which ONE (1) of the following would be the result of removing the "B" RPS Reactor Trip module?

- A. RPS would be placed in a 1 out of 2 logic.
- B. RPS would be placed in a 2 out of 2 logic.
- C. Only the #11 CRD breaker would trip.
- D. All CRD breakers would trip.

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**Q 074**

**Q 074**

**Point Value: 1**

Initial plant conditions:

- Reactor power was 100%.

Sequence of events:

- Loss of entire 1A 125-250 Volt DC Electrical Distribution System.
- Manual Reactor Trip due to Main Feedwater control problems.
- Loss of RCS Subcooled Margin.

From the list below, identify the ONE (1) statement that describes how to secure the RCPs under these conditions.

- A. Trip ALL 4 RCPs using their associated extension controls (4) on Console Center.
- B. Trip RC-P-1A and RC-P-1C using extension controls on Console Center;  
Stop RC-P-1B and RC-P-1D by de-energizing 1B 6900 Volt Buses at Panel PR.
- C. Trip RC-P-1B and RC-P-1D using extension controls on Console Center;  
Stop RC-P-1A and RC-P-1C by de-energizing 1A 6900 Volt Buses at Panel PR.
- D. Stop ALL 4 RCPs by de-energizing 1A and 1B 6900 Volt Buses.

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**Q 075**

**Point Value: 1**

**Q 075**

EG-Y-1B is in parallel operation with the 1E 4160V bus for a surveillance with the following conditions:

- Exciter switch is in Manual
- 1E Bus Voltage is 4165V
- 1E Bus Frequency is 60 HZ
- Diesel load is 2.9MW
- MVARs is 2.2 MVAR

A perturbation on the 8 bus results in the 1E bus voltage reducing to 4120V.

Which ONE of the following operator actions would be required to compensate for this event?

- A. Raise diesel speed using EG-Y-1B Governor Control Switch
- B. Lower diesel speed using EG-Y-1B Governor Control Switch
- C. Raise diesel output voltage using the Manual Voltage Controller
- D. Lower diesel output voltage using the Manual Voltage Controller

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**Q 076**

**Point Value: 1**

**Q 076**

Plant conditions:

- Reactor power is 100%.
- Significant increase in RCS activity causes high alarms on RM-L-1 and RM-L-1 Low.

Identify the ONE (1) statement below that describes the expected automatic action(s) for these plant conditions.

- A. MU-V-3 closes.
- B. MU-V-1A AND MU-V-1B close.
- C. MU-V-2A AND MU-V-2B close.
- D. MU-V-2A, MU-V-2B, AND MU-V-3 close.

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**Q 077**

**Q 077**

**Point Value: 1**

The following plant conditions exist:

- a Circulating Water tube leak has occurred on the "B" side of the condenser
- CE-6A (corrected feedwater cation conductivity) reads 6.5 umho/cm
- CE-6 (feedwater cation conductivity) reads 7.5 umho/cm
- Chemistry has validated the readings

Which ONE (1) of the following actions is required for these plant conditions?

- A. Secure all Moisture Separator Drain Pumps and continue power operation.
- B. Reduce power to less than 50% and isolate the "B" side Circulating Water loop.
- C. Perform a normal plant shutdown and cooldown to Decay Heat Operations.
- D. Trip the reactor and go to ATP 1210-1, Reactor Trip.

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**Q 078**

**Q 078**

**Point Value: 1**

The following plant conditions exist:

- A rupture occurs in the air header supplying MS-V-3s.
- IA-P-4 trips on overload.
- IA-P1A/B and SA-P-1A/B are started successfully.
- Instrument air primary (PI-222) and secondary (PI-1403) pressure indicators on PL are tracking together and continue to decrease.

Which ONE(1) of the following indications would be observed on PL when IA-V-26 closes?

When header pressure drops below:

- A. 60 psig, PI-222 starts to increase and PI-1403 continues to decrease.
- B. 60 psig, PI-1403 starts to increase and PI-222 continues to decrease.
- C. 80 psig, PI-222 starts to increase and PI-1403 continues to decrease.
- D. 80 psig, PI-1403 starts to increase and PI-222 continues to decrease.

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**Q 079**

**Q 079**

**Point Value: 1**

The Fire Protection system is in normal alignment when a leak occurs in the yard fire main. Fire main pressure drops to 85 psig and stabilizes.

Assuming NO operator action, identify the ONE (1) set of fire pumps that would be running at this time.

- A. Fire Service Jockey Pump (FS-P-4)  
Screen House Diesel Driven Fire Pump (FS-P-3)
- B. Circulation Water Diesel Driven Fire Pump (FS-P-1)  
Screen House Motor Driven Fire Pump (FS-P-2)
- C. Screen House Motor Driven Fire Pump (FS-P-2)  
Screen House Diesel Driven Fire Pump (FS-P-3)
- D. Screen House Motor Driven Fire Pump (FS-P-2)  
Fire Service Jockey Pump (FS-P-4)

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**Q 080**

**Q 080**

**Point Value: 1**

Which ONE (1) of the following conditions would permit use of the Post Accident Hydrogen Purge system following a LOCA?

The Post Accident Hydrogen Purge system would be placed in operation with Emergency Director approval AND if:

- A. ONE Hydrogen Recombiner was inoperable AND only after RB Hydrogen concentration reached 3.0%.
- B. ONE Hydrogen Recombiner was inoperable AND only after RB Hydrogen concentration reached 4.0%.
- C. BOTH Hydrogen Recombiners were inoperable AND only after RB Hydrogen concentration reached 3.0%.
- D. BOTH Hydrogen Recombiners were inoperable AND only after RB Hydrogen concentration reached 4.0%.

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**Q 081**

**Q 081**

**Point Value: 1**

The plant is at 100% power with normal system alignments.

Which ONE (1) of the following would result in a discharge of Reactor Coolant to the Reactor Coolant Drain Tank?

- A. "A" Loop RCS Wide Range T-cold failing low.
- B. Leakage through RV Head vent valves RC-V-42 & 43.
- C. Selected RCS Wide Range Pressure failing high without SASS actuation.
- D. Closure of RCP seal return valves MU-V-25 & 26 on an inadvertant 30# ESAS.

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**Q 082**

**Point Value: 1**

**Q 082**

Which ONE (1) of the following are the charcoal filters in the RB Kidney Filter System designed to remove?

- A. Iodine and Xenon
- B. Xenon and Krypton
- C. Iodine and particulates
- D. Xenon and particulates

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**Q 083**

**Point Value: 1**

**Q 083**

Which ONE (1) of the following conditions would result in interlock actuation to prevent further insertion of a fuel assembly into a core location?

- A. Grapple Tube Down indication.
- B. Underload condition on the load cell.
- C. Exceeding a lowering rate of 4 feet per minute.
- D. The bottom of the fuel assembly reaches 3 feet above the core.

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**Q 084**

**Q 084**

**Point Value: 1**

Turbine Bypass Valve (TBV) H/A stations are in hand with demand set at approximately 20% open. A complete loss of the normal Secondary side Instrument Air header occurs.

Which ONE (1) of the following describes the response of the TBVs and the method to control the valves?

The valves will:

- A. Open. Controlled locally using the handwheel.
- B. Close. Controlled locally using the handwheel.
- C. Remain 20% open. Controlled from the H/A station in the CR.
- D. Go to 50% open. Controlled by adjusting local air pressure to the controller.

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**Q 085**

**Point Value: 1**

**Q 085**

The plant has experienced a load rejection.

The following plant conditions exist:

- Turbine load is 50 Mwe
- The Diamond is in manual
- Reactor power has been stabilized at 20%

Which ONE (1) of the following design features will compensate for the mismatch between Reactor power and Turbine load?

- A. The Turbine Bypass Valves will control Turbine Header pressure at 895 psig (setpoint + 10 psig bias).
- B. The Turbine Bypass Valves will control Turbine Header pressure at 960 psig (setpoint + 75 psig bias).
- C. The Atmospheric Dump Valves will control OTSG pressure between 1026 psig and 1052 psig.
- D. The Main Steam Safety Valves will continue to lift to maintain OTSG pressure below 1040 psig.

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**Q 086**

**Q 086**

**Point Value: 1**

RB emergency cooling was placed in operation in response to a steam leak inside containment. The air supply line to RR-V-6 fails resulting in a loss of all air to RR-V-6.

Which ONE (1) of the following actions will be required to maintain proper flow and header pressure in the Reactor River Water system?

- A. Open RR-V-6.
- B. Throttle RR-V-5.
- C. Close RR-V-6 and throttle RR-V-5.
- D. Open RR-V-6 and throttle RR-V-5.

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**Q 087**

**Q 087**

**Point Value: 1**

The plant was operating at 100% power when the following sequence of events occurred:

- SBLOCA
- RB pressure rose to 5 psig
- RCS pressure dropped to 400 psig
- All systems responded in automatic as required
- Manual initiation of ESAS was NOT performed

Following completion of the IMAs for the appropriate ATOG procedures, the following plant conditions are observed:

- RB pressure stabilized at 1 psig
- RCS pressure is 950 psig and rising slowly at 20 psig every 5 minutes

In order to regain control of ESAS actuated components, IAW OP 1105-3, Safeguards Actuation System, for each train the operator must push:

- A. ALL 3 4 psig Enable Reset push buttons.  
ALL 3 LPI Enable & Channel Reset push buttons  
ALL 3 HPI Bypass push buttons
- B. ALL 3 4 psig Enable Reset push buttons.  
ALL 3 LPI Bypass push buttons  
ALL 3 HPI Bypass push buttons
- C. 2 of 3 4 psig Defeat push buttons  
ALL 3 LPI Enable & Channel Reset push buttons  
ALL 3 HPI Bypass push buttons
- D. 2 of 3 4 psig Defeat push buttons  
ALL 3 LPI Bypass push buttons  
ALL 3 HPI Bypass push buttons

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**Q 088**

**Q 088**

**Point Value: 1**

Which ONE (1) document is NOT required to be reviewed prior to assuming shift duties as a licensed Control Room Operator?

- A. ESAS Checklist.
- B. Locked Valve Book.
- C. TCN/STP Book
- D. Revision Review Book.

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**Q 089**

**Q 089**

**Point Value: 1**

Plant conditions:

- Maximum Generation Emergency declared.
- Reactor power is 100%.
- Generator MVAR loading is 460 MVARs OUT.
- Main Generator Hydrogen pressure is 60 psig.

Refer to the attached Figure B-2B from OP 1106-1. From the list of values provided below, identify the **MAXIMUM GENERATOR MEGAWATT OUTPUT CAPABILITY** for these conditions.

- A. 0 MW.
- B. 600 MW.
- C. 800 MW.
- D. 870 MW.

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**Q 090**

**Q 090**

**Point Value: 1**

From the list below, identify the ONE (1) statement that describes the requirements for performing an Independent Verification for an easily accessible manual valve that is required to be closed.

- A. One individual closes the valve, second individual verifies from an independent remote position DEMAND indicator that the valve closed.
- B. One individual closes the valve, second individual independently uses a remote POSITION indicator to verify the valve is closed.
- C. One individual closes the valve, second individual independently verifies the valve is closed by physically turning in the closed direction.
- D. One individual closes the valve, while the second individual visually observes the first individual closing the valve.

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**Q 091**

**Q 091**

**Point Value: 1**

The Borated Water Storage Tank has the following conditions present:

- Boron concentration is 2450 ppm
- Water temperature is 45 degrees F

Which ONE (1) of the following describes the required action and the basis for that action?

- A. Restore boron concentration to at least 2500 ppm in order to ensure that adequate boron concentration exists when filling the fuel transfer canal for refueling.
- B. Restore boron concentration to at least 2500 ppm in order to ensure that reactor remains subcritical by at least 1% DK/K following a LOCA.
- C. Restore water temperature to at least 50 degrees F to prevent crystallization of the boron in the delivery system.
- D. Restore water temperature to at least 50 degrees F to prevent thermal shock to the HPI nozzles.

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**Q 092**

**Q 092**

**Point Value: 1**

To support plant start-up, the valve line-up of a system is required to be modified until work is completed on that system. From the list below, identify the ONE (1) correct description of approval(s) that satisfies requirements to permit this valve line up change, in accordance with AP 1001A.

- A. Two Licensed CROs.
- B. Shift Manager with an SRO License.
- C. One Licensed CRO AND the on-shift STA.
- D. One Licensed CRO AND one Shift Manager/Control Room Supervisor with an SRO license.

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**Q 093**

**Q 093**

**Point Value: 1**

Plant conditions:

- Reactor power is 100%.

During performance of SP 1301-1, Shift and Daily Checks, RM-A-4P failed to meet the acceptance criteria.

Identify the ONE (1) statement that describes PROCEDURALLY REQUIRED reactor operator actions.

- A. Apply a CAUTION TAG to RM-A-4P.
- B. Apply a DO NOT OPERATE TAG to RM-A-4P.
- C. Complete a SDR (Surveillance Deficiency Report) sheet.
- D. Notify the Radcon Department that RM-A-4P is inoperable.

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**Q 094**

**Q 094**

**Point Value: 1**

In addition to the person having clearance, identify ONE (1) specific person whose approval is required prior to changing the condition or position of BLUE tagged ES equipment (SINGLE manipulation).

- A. Plant Manager.
- B. Director, Operations.
- C. Duty Shift Manager.
- D. Licensed Control Room Operator.

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**Q 095**

**Q 095**

**Point Value: 1**

The following conditions exist in a localized area in the Auxiliary Building:

- General area dose rate is 15 mrem per hour
- Highest contaminated swipe survey reads 40,000 dpm/100 square centimeters beta-gamma  
AND 2100 dpm/100 square centimeters alpha.
- Airborne activity will result in 20% of a DAC in one hour.
- The area is posted as a TLD Required Area.

Which ONE (1) of the following identifies the additional posting required for this area?

- A. Contaminated Area; Airborne Radioactivity Area
- B. Radiation Area; Airborne Radioactivity Area
- C. Radiation Area; High Contamination Area
- D. High Radiation Area; Contaminated Area

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**Q 096**

**Q 096**

**Point Value: 1**

A job is to be performed in an area that has a general radiation dose rate of 60 mRem/hr. Installation of temporary shielding to reduce the dose rate to 10 mRem/hr will require a total dose of 30 mRem (for installation and removal).

From the list below, identify the ONE (1) option that will meet ALARA expectations for the entire job process.

- A. 2 workers each taking 35 minutes to perform the job.
- B. 1 worker taking 60 minutes to perform the job.
- C. Utilize temporary shielding, 2 workers each taking 35 minutes to perform the job.
- D. Utilize temporary shielding, 1 worker takes 60 minutes to perform the job.

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**Q 097**

**Q 097**

**Point Value: 1**

Identify the ONE (1) statement that describes the MINIMUM requirement(s) for an individual to be allowed to receive a TEDE dose of 4100 mRem per year, excluding a planned special exposure.

- A. A special RWP is written covering the individual to be permitted to exceed 4000 mRem.
- B. Approvals from the Director, Rad Health & Safety AND the Vice President, TMI-1.
- C. Approval from the President of the Company.
- D. Notification of the NRC.