

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

**Applicant Information**

Name:

Date: December 17, 2007

Facility/Unit: Duane Arnold Energy Center

Region: I  II  III  IV

Reactor Type: W  CE  BW  GE

Start Time: 0800

Finish Time:

**Instructions**

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

**Applicant Certification**

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

\_\_\_\_\_  
 Applicant's Signature

**Results**

RO/SRO-Only/Total Examination Values \_75\_ / \_25\_ / 100\_ Points

Applicant's Scores \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Points

Applicant's Grade \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Percent

**Part A: General Guidelines**

1. **[Read Verbatim]** Cheating on any part of the examination will result in a denial of your application and/or action against your license.
2. If you have any questions concerning the administration of any part of the examination, do not hesitate to ask them before starting that part of the test.
3. SRO applicants will be tested at the level of responsibility of the senior licensed shift position (i.e., shift supervisor, senior shift supervisor, or whatever the title of the position may be).
4. You must pass every part of the examination to receive a license or to continue performing license duties. Applicants for an SRO-upgrade license may require remedial training in order to continue their RO duties if the examination reveals deficiencies in the required knowledge and abilities.
5. The NRC examiner is not allowed to reveal the results of any part of the examination until they have been reviewed and approved by NRC management. Grades provided by the facility licensee are preliminary until approved by the NRC. You will be informed of the official examination results about 30 days after all the examinations are complete.

**Part B: Written Examination Guidelines**

1. **[Read Verbatim]** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.
2. To pass the examination, you must achieve an overall grade of 80.00 percent or greater, with 70.00 percent or greater on the SRO-only items, if applicable. If you only take the SRO portion of the exam (as a retake or with an upgrade waiver of the RO exam), you must achieve an overall grade of 80.00 percent or better to pass. SRO-upgrade applicants who do take the RO portion of the exam and score below 80.00 percent on that part of the exam can still pass overall, but may require remediation. Grades will not be rounded up to achieve a passing score. Every question is worth one point.
3. For an initial examination, the nominal time limit for completing the examination is 6 hours for the RO exam; 3 hours for the 25-question, SRO-only exam; 8 hours for the combined RO/SRO exam; and 4 hours for the SRO exam limited to fuel handling. Notify the proctor if you need more time.  
  
For a requalification examination, the time limit for completing both sections of the examination is 3 hours. If both sections are administered in the simulator during a single 3-hour period, you may return to a section of the examination that you already completed or retain both sections of the examination until the allotted time has expired.
4. You may bring pens, pencils, and calculators into the examination room; however, programable memories must be erased. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.
5. Print your name in the blank provided on the examination cover sheet **and** the answer sheet. You may be asked to provide the examiner with some form of positive identification.

6. Mark your answers on the answer sheet provided, and do not leave any question blank. Use only the paper provided, and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change. If you are recording your answers on a machine-gradable form that offers more than four answer choices (e.g., "a" through "e"), be careful to mark the correct column.
7. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate to ask them before answering the question. Note that questions asked during the examination are taken into consideration during the grading process and when reviewing applicant appeals. Ask questions of the NRC examiner or the designated facility instructor *only*. A dictionary is available if you need it.

When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question. Similarly, you should assume that no operator actions have been taken, unless the stem of the question or the answer choices specifically state otherwise. Finally, answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or training references, you should answer the question based on the *actual plant*.

8. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

When you complete the examination, assemble a package that includes the examination questions, examination aids, answer sheets, and scrap paper, and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. The scrap paper will be disposed of immediately after the examination.

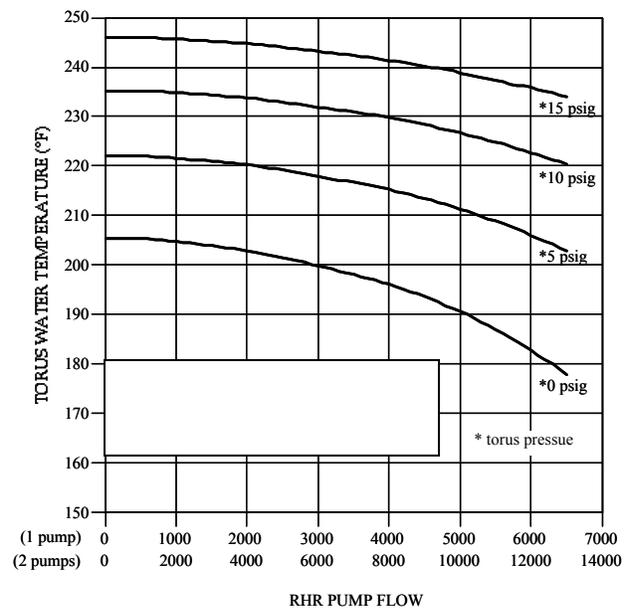
10. After turning in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.
11. Do you have any questions?

QUESTION 1

With the plant operating at 100% power, a Loss of Coolant Accident occurs, resulting in the following indications:

- RPV Water Level is -15 (minus 15) inches, stable.
- Torus Water Level is 6.5 feet.
- Torus Pressure is 6 psig.
- Torus Water Temperature is 190°F
- BOTH RHR Loops are injecting 11,000 gpm to maintain RPV Water Level.

Which ONE of the following describes the impact of these conditions on RHR LPCI mode and identifies the required actions?



- Vortex Limits are being violated. It is required to maintain RHR flow.
- Vortex Limits are being violated. It is required to reduce RHR flow.
- NPSH requirements are being violated. It is required to maintain RHR flow.
- NPSH requirements are being violated. It is required to reduce RHR flow.

## QUESTION 2

With RHR operating in the Shutdown Cooling Mode, the following parameters have been recorded:

<u>Parameter</u>	<u>Time</u>	
	1400	1430
• Reactor Pressure	75 psig	27 psig
• Recirc Loop A/B Temperature	335 °F	300 °F
• Rx Vessel Shell Temperature	345 °F	315 °F
• Bottom Head Drain Temperature	365 °F	350 °F

Which ONE of the following is the cooldown rate?

- a. 30 °F/hr
- b. 60 °F/hr
- c. 70 °F/hr
- d. 100 °F/hr

## QUESTION 3

With High Pressure Coolant Injection in standby readiness, Narrow Range Barton Reactor Water Level Indicating Switch LIS-4592B fails LOW.

How will the High Pressure Coolant Injection (HPCI) system be affected?

- a. HPCI will have initiation logic partially actuated. If injecting, HPCI will automatically trip upon receipt of a valid High RPV Water Level signal.
- b. HPCI will have initiation logic partially actuated. If injecting, HPCI will NOT automatically trip upon receipt of a valid High RPV Water Level signal.
- c. HPCI will NOT have initiation logic partially actuated. If injecting, HPCI will automatically trip upon receipt of a valid High RPV Water Level signal.
- d. HPCI will NOT have initiation logic partially actuated. If injecting, HPCI will NOT automatically trip upon receipt of a valid High RPV Water Level signal.



## QUESTION 6

With the plant operating at 100% power, the following alarm is received:

- 1C03A B-8, A CORE SPRAY DISCHARGE LINE LO PRESSURE

What is the impact of this condition on the Core Spray System?

- a. Core Spray Pump, 1P-211A may cause piping damage if started.
- b. Core Spray Pump, 1P-211A is incapable of producing an ADS Logic permissive signal, if started.
- c. Core Spray Inboard Inject Valve, MO-2117 will immediately OPEN if the Core Spray System Initiation Logic is actuated.
- d. Core Spray Inboard Inject Valve, MO-2117 can be OPENED while Core Spray Outboard Inject Valve, MO-2115 is OPEN.

## QUESTION 7

The plant has been in Station Blackout conditions for 30 minutes. The American Transmission Company (ATC) Dispatcher calls to report that the grid has been restored at less than normal voltage. The operators at 1C08 determine that incoming voltage is 2800 VAC. There are no bus or transformer lockouts. All 4KV Bus Transfer switches have been placed in MANUAL at Panel 1C08.

Which of the following CORRECTLY describes the operation of the Degraded Voltage protection circuits and closing of breakers 1A301/302 and 1A401/402, the Standby/Startup Transformer Supplies to 1A3 and 1A4?

- a. Overriding and resetting Degraded Voltage relays is procedurally allowed and can be accomplished at this grid voltage.
- b. Overriding of Degraded Voltage relays is procedurally allowed, but Degraded Voltage protection would not reset at this grid voltage.
- c. Overriding and resetting Degraded Voltage relays is NOT procedurally allowed at this grid voltage. This would prevent closure of 1A301/302 and 1A401/402.
- d. Overriding and resetting Degraded Voltage relays is procedurally allowed and can be accomplished at this grid voltage. Closure of 1A301/302 and 1A401/402 would be prevented by breaker undervoltage protection.

## QUESTION 8

Which ONE of the following describes the normal indications following a SUCCESSFUL INITIATION of Standby Liquid Control System?

- a. Alarm 1C05A F-3, SBLC SQUIB VALVE CONTINUITY LOSS DOES NOT actuate and SBLC Pump Discharge Pressure is greater than 1350 psig.
- b. Alarm 1C05A F-3, SBLC SQUIB VALVE CONTINUITY LOSS DOES NOT actuate and SBLC Pump Discharge Pressure is less than 1350 psig.
- c. Alarm 1C05A F-3, SBLC SQUIB VALVE CONTINUITY LOSS actuates and SBLC Pump Discharge Pressure is greater than 1350 psig.
- d. Alarm 1C05A F-3, SBLC SQUIB VALVE CONTINUITY LOSS actuates and SBLC Pump Discharge Pressure is less than 1350 psig.

## QUESTION 9

With reactor power at 100% and core flow at 48 Mlbm/hr, a malfunction in the Turbine Stop Valve electronic circuitry results in closing Turbine Stop Valves number 1 AND 2.

How will the plant respond to this malfunction?

- a. The reactor scrams on High Pressure, the Recirculation Pumps trip.
- b. The reactor scrams on High Pressure, the Recirculation Pumps runback.
- c. The reactor scrams on Main Turbine Trip, the Recirculation Pumps trip.
- d. The reactor scrams on Main Turbine Trip, the Recirculation Pumps runback.

## QUESTION 10

The reactor is operating at 100% power. With RPV Water level at 195 inches, HPCI started due to a VALID signal.

Which ONE of the following describes the effect of this actuation on the plant and the required procedure entry?

- a. The reactor will scram when RPV Water Level rises to 211 inches, which requires entry into IPOI-5, Reactor Scram ONLY.
- b. The reactor will immediately scram; it is required to enter EOP-1, RPV Control AND EOP-2, Primary Containment Control.
- c. The reactor will immediately scram; it is required to enter EOP-1, RPV Control ONLY.
- d. The reactor will scram when APRM Power Level rises, which requires entry into EOP-1, RPV Control AND IPOI-5, Reactor Scram.

## QUESTION 11

A reactor startup is in progress. The reactor has been declared critical and the operator has established a 150 second period. All IRMs are on scale on range 4. The following indications occur simultaneously:

- 1C05A C-3, IRM UPSCALE alarm
- 1C05A B-3, IRM A, C, OR E UPSCALE TRIP OR INOP alarm
- 1C05A A-2, "A" RPS AUTO SCRAM alarm
- 1C05B A-6, ROD OUT BLOCK alarm

These indications were caused by which ONE of the following?

- a. IRM E power supply failure.
- b. IRM E being ranged to range 3.
- c. IRM E being ranged to range 5.
- d. IRM E being withdrawn from the core.

## QUESTION 12

With the Reactor Mode Switch in STARTUP, which ONE of the following conditions will result in Source Range Monitors producing a Reactor Scram?

- a. SRM Channel "A" Mode Switch NOT in OPERATE and then SRM Channel "B" Mode Switch moved out of OPERATE.
- b. SRM Channel "A" and "B" indicating  $5 \times 10^5$  counts per second with 1C15 and 1C17 Shorting Links installed.
- c. SRM Channel A indicating a 15 second period with 1C15 and 1C17 Shorting Links removed.
- d. SRM Channel A indicating  $5 \times 10^5$  counts per second with 1C15 and 1C17 Shorting Links removed.

## QUESTION 13

The reactor is operating with both recirculation loops in operation, conditions are as follows:

- Reactor Power is 60%.
- Recirc Loop Flow is 61% per loop.
- Total Core Flow is 30 Mlbm/hr, equally divided between both loops.

With these conditions, which ONE of the following is the correct APRM Flow Biased SCRAM setpoint?

- a. 75%
- b. 82%
- c. 92%
- d. 99%

## QUESTION 14

The plant was operating at power when a Main Steam leak occurred, resulting in the following conditions:

- The reactor has been scrammed.
- ALL MSIVs have been closed.
- RPV Water Level is 110 inches.

What is the RCIC system response if the operator depresses the "RCIC MANUAL ISOLATION IF RX LO LO LVL PRESENT" pushbutton?

- a. RCIC will continue to operate.
- b. MO 2400 RCIC INBD STEAM LINE ISOL and MO 2401 RCIC OUTBD STEAM LINE ISOL will close
- c. MO 2400 RCIC INBD STEAM LINE ISOL and MO 2405 TURBINE STOP VALVE will close
- d. MO 2401 RCIC OUTBD STEAM LINE ISOL and MO 2405 TURBINE STOP VALVE will close

## QUESTION 15

With CONTAINMENT N<sub>2</sub> SUPPLY ISOL CV-4371A failed SHUT, how are the Automatic Depressurization System Valves affected?

- a. ADS Valves WILL NOT operate if logic is actuated. It is required to use Alternate Depressurization systems, if required.
- b. ADS Valves WILL NOT operate if logic is actuated. It is required to defeat isolations and realign Nitrogen to the Drywell.
- c. ADS Valves WILL operate if logic is actuated. Accumulators inside the Drywell will provide a backup Nitrogen supply to the ADS Valves.
- d. ADS Valves WILL operate if logic is actuated. Accumulators outside the Drywell will provide a backup Nitrogen supply to the ADS Valves.

## QUESTION 16

Following a reactor scram, a loss of Feedwater occurs, resulting in steadily lowering RPV Water Level, resulting in the following:

<u>TIME</u>	<u>EVENT</u>
11:00	HPCI Turbine started and immediately TRIPPED.
11:20	Main Steam Isolation Valves CLOSE.
11:25	Core Spray and RHR Injection Valves OPEN.
11:26	Core Spray and RHR flow is indicated.

Based on these trends, ADS valves initially OPEN at what time?

- a. 11:02
- b. 11:22
- c. 11:27
- d. 11:28

## QUESTION 17

The plant was operating in MODE 1 at 80% power when RPS "A" MG set fails, resulting in the following alarms:

- 1C05A A-8 PCIS CHANNEL "A" STEAM TUNNEL HI TEMP
- 1C05A B-8 PCIS CHANNEL "A" MAIN STEAM LINE HI FLOW
- 1C05A C-8 PCIS CHANNEL "A" MAIN STEAM LINE LO PRESSURE
- 1C05A D-8 PCIS CHANNEL "A" HI COND BACKPRESS OR TURB BLDG HI TEMP
- 1C05B A-8 PCIS GROUP "1" ISOLATION INITIATED
- 1C05B C-2 MAIN STEAM LINE HI HI RAD / INOP TRIP
- 1C05B C-3 MSIVs NOT FULLY OPEN TRIP

With these conditions, what is the affect on the Main Steam Isolation Valves and what actions are required?

- a. All MSIVs close. It is required to place the Mode Switch in SHUTDOWN.
- b. Inboard MSIVs close. It is required to place the Mode Switch in SHUTDOWN
- c. Outboard MSIVs close. It is required to transfer RPS to alternate and reset PCIS.
- d. All MSIVs remain open. It is required to transfer RPS to alternate and reset PCIS.

## QUESTION 18

Which of the following describes how power is provided to the solenoids on the Safety Relief Valves (SRVs)?

- a. All Safety Relief Valves (SRVs) solenoids can be supplied by either division of 125 VDC.
- b. ADS SRV solenoids can only be supplied by Division 1 125 VDC power and LLS SRV solenoids can only be supplied by Division 2 125 VDC power.
- c. LLS SRV solenoids can only be supplied by Division 1 125 VDC power and ADS SRV solenoids can only be supplied by Division 2 125 VDC power.
- d. Division 1 SRV solenoids can only be supplied by Division 1 125 VDC power and Division 2 SRV solenoids can only be supplied by Division 2 125 VDC power.

## QUESTION 19

With HPCI in standby, a failure results in alarm 1C03C C-9, HPCI 125 VDC LOGIC POWER FAILURE. Investigation reveals that 125 VDC Relay Logic Power Bus A in 1C32 has been lost.

Which ONE of the following statements describes the HPCI system response if RPV drops to 100 inches?

- a. HPCI will auto start.
- b. HPCI will auto start but will run at minimum RPM.
- c. HPCI will trip and MO 2238, HPCI Inboard Steam Line Isolation will auto isolate.
- d. HPCI will trip and MO 2239, HPCI Outboard Steam Line isolation will auto isolate.

## QUESTION 20

Standby Gas Treatment Train A is in service following an automatic initiation signal. Standby Gas Treatment Train B has been returned to STANDBY mode. SBTG Train A Exhaust Fan 1V-EF-15A tripped due to an overcurrent condition.

How will the Standby Gas Treatment System respond and what actions are required?

- a. Both Trains of SBTG will be inoperative; it is required to enter EOP-3 Secondary Containment Control
- b. "B" Train remains in STANDBY; it is required to MANUALLY start SBTG Train B.
- c. Isolation Lockout Relay LR 5830B will initiate an automatic start of SBTG Train B. It is required to verify SBTG Train B parameters.
- d. SBTG System Low Flow will initiate an automatic start of SBTG Train B. It is required to verify SBTG Train B parameters.

## QUESTION 21

With the plant operating at full power a lightning strike occurs in the switchyard resulting in the following events:

- Main Generator Primary Lockout Trip
- Switchyard 161kV Breakers M, J, and K trip and are locked out.

Which ONE of the following describes the effect of this failure on buses 1A1, 1A2, 1A3 and 1A4?

- 1A1 and 1A2 will be powered by Aux Transformer 1X2  
1A3 and 1A4 will be powered by Startup Transformer 1X3
- 1A1 and 1A2 will be powered by Aux Transformer 1X2  
1A3 and 1A4 will be powered by Standby Transformer 1X4
- 1A1 and 1A2 will be deenergized  
1A3 will be powered by 1G-31  
1A4 will be powered by 1G-21
- 1A1, 1A2, 1A3, and 1A4 will be powered by Startup Transformer 1X3

## QUESTION 22

With Instrument AC Power Panel 1Y11 de-energized, what is the effect on the Primary Containment Isolation System (PCIS)?

- Division 1 Group 2 valves will shut.
- Division 2 Group 2 valves will shut.
- Division 1 Group 3 valves will shut.
- Division 2 Group 3 valves will shut.

## QUESTION 23

With the plant operating at 100% power and ALL electrical systems in their normal lineup, 4160 VAC Bus 1A4 experiences a BUS LOCKOUT.

Which ONE of the following describes the affect of this failure on 125 VDC Distribution?

- a. 125 VDC Bus 1D10 will be powered from ONLY the Battery until Charger 1D120 is manually aligned to Bus 1D10.
- b. 125 VDC Bus 1D20 will be powered from ONLY the Battery until Charger 1D120 is manually aligned to Bus 1D20.
- c. 125 VDC Bus 1D10 will be powered from ONLY the Battery until EDG 1G21 automatically re-energizes Bus 1A4.
- d. 125 VDC Bus 1D20 will be powered from ONLY the Battery until EDG 1G21 automatically reenergizes Bus 1A4.

## QUESTION 24

Standby Diesel Generator 1G-31 has just been paralleled to the grid for a load test. Diesel Generator 1G-31 is operating at maximum continuous load limit and 4160 VAC.

Which ONE of the following values of Diesel Generator current will produce operation at 0.9 power factor?

- a. 440 amps
- b. 460 amps
- c. 500 amps
- d. 520 amps

## QUESTION 25

While operating at 100% power, the following alarms occur, due to a break in Instrument Air Dryer After Filter 1F 534A:

- 1C07B B-10 INSTRUMENT AIR DRYERS 1T 265A/B LO DISCH PRESSURE
- 1C07B C-10 INSTRUMENT AIR DRYERS 1T 265A/B HI  $\Delta$ P
- 1C05A D-6 ROD DRIFT

Based on these indications, what is the status of the In-Service Instrument Air Dryer Chambers and what procedural actions are required?

- a. BOTH Instrument Air Dryer Chambers are aligned to provide flow, CV-3026 Instrument Air Dryer Bypass is SHUT; it is required to isolate Instrument Air Dryer After Filter, 1F-534A.
- b. BOTH Instrument Air Dryer Chambers are aligned to provide flow, CV-3026 Instrument Air Dryer Bypass is OPEN, it is required to manually scram the reactor.
- c. BOTH Instrument Air Dryer Chambers are isolated, CV-3026 Instrument Air Dryer Bypass is SHUT; it is required to isolate Instrument Air Dryer After Filter, 1F-534A.
- d. BOTH Instrument Air Dryer Chambers are isolated, CV-3026 Instrument Air Dryer Bypass is OPEN; it is required to manually scram the reactor.

## QUESTION 26

With the plant operating at 30% power, RWCU was removed from service to repair Non Regenerative Heat Exchanger, 1E-215A. Following the repair, while returning RWCU Filter Demineralizers to service, a 2 gpm leak develops in the tubes of the RWCU Non Regenerative Heat Exchanger.

Which ONE of the following indications will result?

- a. Rising RWCU F/D Conductivity
- b. Rising RBCCW Surge Tank Level
- c. Lowering RBCCW Surge Tank Level
- d. RWCU High Differential Flow Trip

## QUESTION 27

The plant is operating at 90% power when one of the Feedwater Flow transmitter inputs fails LOW.

What will be the affect on RPV water level?

- a. There will be no effect on RPV water level.
- b. RPV water level will decrease because FWLC will initially throttle the Feed Regulating Valves closed. RPV level will stabilize at a new lower value
- c. RPV water level will initially decrease because steam flow is higher than feed flow; however, the Feed Regulating Valves will bring level back to level setpoint.
- d. RPV water level will increase because FWLC will open the Feed Regulating Valves due to steam flow being higher than feed flow. RFPs may trip on high water level.

## QUESTION 28

A reactor startup is in progress, with power at Range 4 of the Intermediate Range Monitors. The Rod Worth Minimizer experiences a critical self test failure.

In this condition, what is the impact of this failure?

- a. The Rod Worth Minimizer is not required OPERABLE, in this condition a Control Rod Drop Accident cannot cause fuel damage.
- b. The Rod Worth Minimizer is required OPERABLE, this startup may NOT continue, the only permissible rod motion is by reactor scram.
- c. The Rod Worth Minimizer is required OPERABLE, this startup may continue, if a second licensed operator verifies rod movements.
- d. The Rod Worth Minimizer is not required OPERABLE, but must be restored OPERABLE prior to exceeding 30% reactor power.

## QUESTION 29

Both Reactor Recirculation pumps were running at 70% speed when an internal component failure in the "B" MG SET SPEED CONTROL caused the controller speed demand output signal to instantaneously fail to the MAXIMUM value.

Which ONE of the following CORRECTLY describes the expected affect of this failure on core flow?

Core flow will rise until:

- a. the "B" Recirc Scoop Tube Positioner reaches its ELECTRICAL STOP.
- b. the "B" Recirc Scoop Tube Positioner reaches its MECHANICAL STOP.
- c. a "B" Recirc Scoop Tube Positioner LOCK-UP occurs due to high milliamp output signal from the Controller.
- d. a "B" Recirc Scoop Tube Positioner LOCK-UP occurs due to high deviation between the Controller speed demand and the Positioner position.

## QUESTION 30

With the plant operating at full power, RBCCW flow is lost to the RWCU system. RWCU temperatures are rising.

If RBCCW flow is not restored to the RWCU system, which ONE of the following will result?

- a. NO valve closures will occur, the RWCU Pump will TRIP.
- b. BOTH MO 2701, OUTBD CLEANUP SUCT ISOL, AND MO 2740, CLEANUP OUTBD RETURN ISOL will close and the RWCU Pump will TRIP.
- c. ONLY MO 2700, INBD CLEANUP SUCT ISOL, will close and the RWCU Pump will TRIP.
- d. MO 2700, INBD CLEANUP SUCT ISOL, AND MO 2701, OUTBD CLEANUP SUCT ISOL, AND MO 2740, CLEANUP OUTBD RETURN ISOL will close and the RWCU Pump will TRIP.

## QUESTION 31

The plant has experienced a transient resulting in the following conditions:

- RPV Water Level is 55 inches, lowering.
- RPV Pressure is 225 psig, lowering.
- Drywell Pressure is 1.5 psig, stable.
- Standby Diesel Generator 1G-21 did NOT start.
- BOTH Reactor Recirc MG sets have TRIPPED.
- MO-4627, A RECIRC PUMP DISCHARGE VALVE is SHUT.

What is the current status of the RHR system?

- a. NO RHR pumps are running.
- b. ALL RHR pumps are running, injecting into Loop A.
- c. ALL RHR pumps are running, and are NOT injecting.
- d. ONLY RHR pumps A and C are running and are injecting into Loop A.

## QUESTION 32

With the plant operating at 100% power, a catastrophic reference leg break occurs affecting TWO Narrow Range GEMAC Reactor Water Level instruments.

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

- a. RFP flow will decrease, producing a Low RPV Water Level Reactor Scram immediately.
- b. RFP flow will increase, resulting in a High RPV Water Level Main Turbine Trip.
- c. Main Turbine and RFP High RPV Water Level Trips are disabled.
- d. Main Turbine and RFP High RPV Water Level Trips will immediately occur.

## QUESTION 33

With the plant operating at 60% power, a Reactor Feed Pump trip resulted in the following:

- 1C04A D-2, "A" RECIRC MG 20% OR 45% FLOW LIMITER IN EFFECT alarms.
- 1C04A D-8, "B" RECIRC MG 20% OR 45% FLOW LIMITER IN EFFECT alarms.
- RPV Water Level lowered to 180 inches and recovered.
- Recirculation Pump Speeds are 62% and LOWERING.

Which ONE of the following actions are required?

- a. Take MANUAL control of BOTH Feedwater Regulating Valves.
- b. Place BOTH SCOOP TUBE CONTROL Switches in the LOCKED position.
- c. When power has stabilized, DEPRESS BOTH 45% Runback Speed Limiter RESET pushbutton provided on Panel 1C04.
- d. When power has stabilized, MATCH the MG Set Speed Controllers PERCENT SPEED and PERCENT SPEED DEMAND signals.

## QUESTION 34

With the PREFERRED loop of RHR operating in the Shutdown Cooling Mode, which ONE of the following buses provides power to the operating RHR Pump?

- a. 1A3
- b. 1A4
- c. 1B32
- d. 1B42

## QUESTION 35

The Mode Switch is in REFUEL and all control rods are inserted. The Refueling Bridge operator grappled a fuel bundle, raised the grapple, and commenced moving the bundle towards the core.

Which ONE of the following describes what will result as the Refueling Bridge moves towards the core?

The Refueling Bridge:

- a. continues over the core AND initiates a control rod block.
- b. continues over the core AND causes NO other protective actions.
- c. stops before it reaches the core AND initiates a control rod block.
- d. stops before it reaches the core AND causes NO other protective actions.

## QUESTION 36

With the plant operating at full power, 1C07A A-1, EHC 24 VDC POWER FAILURE alarms due to loss of BOTH +24 VDC power supplies to EHC.

Which ONE of the following describes the affect, if any, of this event on the Turbine Generator?

- a. The Turbine Generator will continue to operate at full load.
- b. The Turbine Generator load will lower due to an automatic runback of Load Set.
- c. The Turbine Generator will immediately TRIP and Bypass Valves will OPEN to control Reactor Pressure.
- d. The Turbine Generator will immediately TRIP and Bypass Valves will NOT OPEN to control Reactor Pressure.

## QUESTION 37

With the plant operating at 100% power, the following occurs:

- 1C04B B-4 STEAM LEAK DET AMBIENT HI TEMP alarms.
- Torus Catwalk Ambient Air Temperature is 155°F, stable.

With these conditions, which ONE of the following actions will result?

- a. No AUTOMATIC isolations will occur due to these conditions.
- b. HPCI will isolate with a 3 second time delay
- c. RCIC will isolate with a 15 minute time delay
- d. HPCI will isolate with a 15 minute time delay

## QUESTION 38

Annunciator 1C26A C-2, CONTROL BLDG INTAKE AIR RAD MON RIM 6101A HI / TROUBLE alarms with RIM 6101A reading 5 mr / hr.

Which ONE of the following is the required response to these indications?

It is required to verify that:

- a. the Battery Room Exhaust Fans 1V-EF-30A starts.
- b. the Control Building Air Conditioning units shift into fresh air mode.
- c. the Control Building Chiller has shifted to the 75 horsepower mode of operation.
- d. the Standby Filter Unit lockout relays trip isolating the Control Building Intake and Exhaust Dampers.

## QUESTION 39

Following a trip of a single Recirc Pump during a startup, the following parameters exist:

- Reactor Power (APRM) is 35% and stable.
- Core Flow as determined by core plate D/P is 19.0 Mlb/hr and stable.

Which ONE of the following is correct, concerning continued operation?

- Continued operation is NOT ALLOWED and a Reactor Scram must be inserted.
- A SOLOMON stability monitor case is to be evaluated to determine if continued operation is allowed.
- The buffer zone has been entered and must be exited by WITHDRAWING control rods or RAISING Recirc flow.
- The exclusion zone has been entered and must be exited by WITHDRAWING control rods or RAISING Recirc flow.

## QUESTION 40

The plant is at 100% power. 1A3 and 1A4 are being supplied from the Standby Transformer. The Startup Transformer has just been reenergized and is available.

Which ONE of the following describes the actions that will occur if a Standby Transformer lockout occurs?

- No scram occurs. The essential buses fast transfer to the Startup Transformer.
- An immediate reactor scram occurs. The essential buses slow transfer to the Startup Transformer.
- An immediate reactor scram occurs. The Standby Diesel Generators will reenergize the essential buses.
- The reactor scrams on Low RPV Level due to loss of non-essential buses. The Standby Diesel Generators will reenergize the essential buses.

## QUESTION 41

Given the following conditions:

- 1D20, 125 VDC DIVISION 2 DISTRIBUTION PANEL, is totally de-energized.
- A manual reactor scram has been initiated, and ALL RODS are full in.
- Reactor pressure is 200 psig and stable.
- Non-Essential Electrical Buses experienced an OPEN CIRCUIT TRANSFER.
- EOP-1, "RPV Control", has been entered to control RPV Level.
- CRS has directed the crew to "Restore and maintain RPV level between +170 and +211 inches with one or more of the Preferred Injection Systems".

With NO OPERATOR ACTIONS TAKEN to address the electrical problems listed above, which ONE of the Preferred Injection Systems from EOP-1, Table 1A is available for MANUAL injection into the RPV?

- a. Startup and injection of the RCIC System.
- b. LPCI injection using 1P-229B, B RHR PUMP.
- c. Core Spray injection using 1P-211B, B CORE SPRAY PUMP.
- d. Feedwater injection using the 1P-8A, A CONDENSATE PUMP.

## QUESTION 42

The plant is operating at 18% power, 100 MWe, when a failure causes a Main Turbine trip.

Which ONE of the following describes the affect of this transient on Reactor Power?

- a. Reactor Power will immediately lower due to a Reactor Scram.
- b. Reactor Power will immediately rise due to void collapse, resulting in a Reactor Scram.
- c. Reactor Power will rise over a period of time due to lower Feedwater Temperature.
- d. Reactor Power will lower over a period of time due to RR MG Speed reduction.

## QUESTION 43

A reactor startup is in progress with power at 17%.

A failure causes ALL Turbine Control Valves to fail OPEN, resulting in an automatic scram.

Plant parameters are as follows:

- RPV Water Level reached a minimum of 177 inches, and stabilized at 195 inches.
- Reactor Pressure reached a minimum of 830 psig and is rising.

With NO operator action, which ONE of the following lists the decay heat removal methods which are immediately available?

- a. Safety Relief Valves and Reactor Water Cleanup ONLY.
- b. Safety Relief Valves, Reactor Water Cleanup, and Main Steam Line Drain Valves ONLY.
- c. Safety Relief Valves, Main Steam Line Drain Valves, and Main Turbine Bypass Valves ONLY.
- d. Safety Relief Valves, Reactor Water Cleanup, Main Steam Line Drain Valves, and Main Turbine Bypass Valves.

## QUESTION 44

While executing AOP 915, Shutdown Outside Control Room, BOTH Manual Scram Pushbuttons have been depressed. The Full Core Display shows that 85 Control Rods FULL IN lights are ON and 4 Control Rods FULL IN lights are OFF.

In accordance with AOP 915, what other method can be used to verify control rod insertion?

- a. Requesting a Rod Log
- b. Check SPDS for ALL RODS IN
- c. Use of Refuel One Rod Selected Permissive
- d. Check the rods are at position 00 on the Four Rod Display

## QUESTION 45

It is summer. The plant is operating at 100% with no inoperable equipment. The "C" and "D" wells are in service.

- "C" Well flow rate is 400 gpm.
- "D" Well flow rate is 900 gpm.

Which ONE of the following will occur if the "D" Well Water pump tripped?

- a. Main Plant Intake Coils Bypass Valve, CV-4464 opens.
- b. Control Building Chillers Bypass Valve, MO-2039C opens.
- c. Condenser Area Air Cooling Coils, 1V-AC-21 AND 1V-AC-22 isolate.
- d. Drywell Cooling Loops Well Water Supply and Return Valves, CV-5718A AND CV-5704A close.

## QUESTION 46

Due to lowering Instrument Air Pressure, AOP-518, FAILURE OF INSTRUMENT AND SERVICE AIR is being executed.

1C05A, F-1, "A" or "B" FEED REG VALVE POSITION LOCKED is activated.

If Instrument Air pressure cannot be restored, how are Feedwater Regulating Valves, CV-1579 and CV-1621, affected; and what procedural action(s) is (are) required?

Feedwater Regulating Valves will fail:

- a. SHUT; it is required to reduce Reactor Power to control RPV Water Level.
- b. SHUT; it is required to use the FEEDWATER STARTUP CONTROL VALVE, CV-1622 to control RPV Water Level.
- c. OPEN; it is required to THROTTLE A AND B FEEDLINE BLOCK Valves, MO-1592 and MO-1636 to control RPV Water Level.
- d. OPEN; it is required to completely SHUT A FEEDLINE BLOCK Valve, MO-1592, OR B FEEDLINE BLOCK Valve, MO-1636, to control RPV Water Level.

## QUESTION 47

What is the reason that AOP 149, LOSS OF SHUTDOWN COOLING requires a HIGHER RPV Water Level established and maintained?

The HIGHER RPV Water Level:

- a. floods the Moisture Separators which provides a path for natural circulation.
- b. provides additional mass of water in the Reactor Vessel which will delay boiling.
- c. allows the Main Steam Line Drains to provide a drain path for feed and bleed.
- d. provides greater Net Positive Suction Head for the Reactor Water Cleanup Pumps.

## Question 48

DAEC is in MODE 5 with core alterations in progress. While an irradiated fuel bundle is being removed from the core, the refueling grapple malfunctions and the bundle is damaged. The following indications are observed in the control room:

- RI 9163, Refuel Floor North End High Radiation ARM reads 17 mr/hr
- RI 9164, Refuel Floor South End High Radiation ARM reads 13 mr/hr
- RIS 4131A, Fuel Pool Exhaust Radiation Monitor reads 11 mr/hr
- RIS 4131B, Fuel Pool Exhaust Radiation Monitor reads 9 mr/hr

Which ONE of the following statements describes the plant response and expected operator actions?

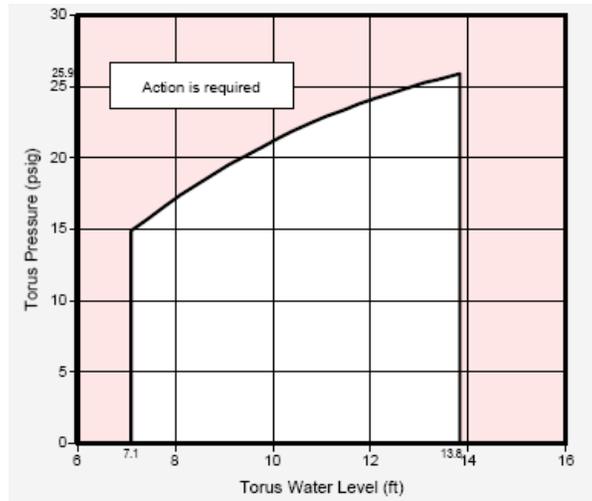
- a. RI 9163 alarm setpoint has been exceeded, it is necessary to verify a PCIS Group III Inboard isolation has occurred.
- b. Both RIS 4131A and RIS 4131B have exceeded their setpoints. Verify a complete PCIS Group III isolation has occurred.
- c. Both RIS 4131A and RIS 4131B have exceeded their setpoint. Verify 1VEF10, Refueling Pool Exhaust Fan, automatically STARTs.
- d. RI 9164 alarm setpoint has been exceeded, it is necessary to verify Reactor Building Ventilation has automatically shifted to HE-4 mode, (Spent Fuel Removal Mode).

QUESTION 49

Following a transient, the following conditions exist:

- Drywell Pressure is 23 psig.
- Torus Pressure is 21 psig.
- Torus Water Level is 9 feet.

What is the hazard associated with these conditions?



- a. Cavitation may occur in Core Spray Pumps.
- b. Evaporative cooling may result in containment failure.
- c. Inability to quench steam may result in containment failure.
- d. Chugging at the downcomers may result in damage to the Torus.

## QUESTION 50

Following a Loss of Offsite Power, the following conditions exist:

- HPCI is maintaining RPV Water Level 170 to 211 inches.
- RPV Pressure is 1000 psig, with manual SRV operation controlling pressure.
- Following SRV opening, HPCI TRIPS due to RPV Water Level.

Which ONE of the following actions are permitted by EOP-1, RPV Control, to stabilize HPCI operation?

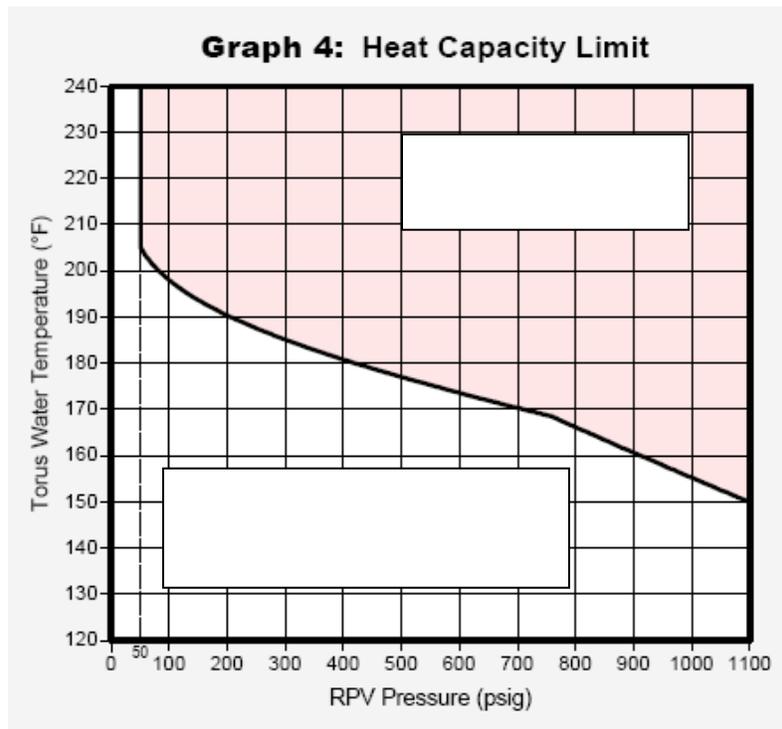
- a. LOWER Reactor Pressure to 700 psig.
- b. LOWER RPV Water Level to +15 to +211 inches.
- c. LOWER RPV Water Level to -25 to +211 inches.
- d. RAPIDLY LOWER Reactor Pressure by opening FOUR SRVs and use Low Pressure systems.

QUESTION 51

Following a transient, conditions are as follows:

- MSIVs are closed
- RPV Pressure is 1000 psig
- Torus Water Temperature is 150°F
- Torus Water Level is 10.4 feet
- Drywell pressure is 2.7 psig

Which ONE of the following actions are required?



- a. RAISE Torus Water Level per EOP-2 to raise heat absorption capacity of torus.
- b. LOWER Reactor Pressure to maintain margin to HCTL curve
- c. PERFORM an Emergency Depressurization using SRVs since the HCTL has been exceeded.
- d. ANTICIPATE Emergency Depressurization using Bypass Valves to maintain margin to HCTL curve.

## QUESTION 52

A fire has severely damaged 250 VDC Bus 1D40, which will not be available for at least a week.

Under these conditions, which ONE of the following groups of systems is available for a safe plant shutdown from the Control Room?

- a. Core Spray and HPCI
- b. Core Spray and RHR LPCI Mode
- c. HPCI and RHR Shutdown Cooling Mode
- d. RCIC and RHR Shutdown Cooling Mode

## QUESTION 53

A loss of coolant accident with concurrent loss of Well Water pumps has occurred while at power. Operators are attempting to restore Well Water and Drywell Cooling.

The CRS orders that an Emergency Depressurization be initiated due to inability to restore and maintain Drywell Temperature below a maximum temperature.

Which ONE of the following is a basis for this action?

Emergency Depressurization is performed at this point in order to ensure:

- a. that indications from the RPV water level instruments will remain valid after the blowdown
- b. that water hammer will not occur in the Well Water System when Drywell Cooling loop flow is restored
- c. that the blowdown is performed before exceeding the environmental qualification limits of the ADS SRVs.
- d. that the energy within the reactor is directed to the torus before exceeding the Torus Heat Capacity Limit.

## QUESTION 54

The plant was operating at 93% thermal power when a transient occurred. Current plant conditions are as follows:

- ALL Control Rods are inserted.
- RPV Water Level is 130 inches and stable.
- Reactor Pressure is 55 psig and stable.
- Drywell Pressure is 4 psig and slowly lowering.
- Drywell Temperature is 145°F and stable.
- Torus Pressure is 3 psig and slowly lowering.
- Torus Water Temperature is 190°F and stable.
- Torus Water Level is 10.1 feet and lowering.
- Torus and Drywell Sprays are in operation.
- Torus Cooling is maximized with the remaining RHR flow.
- "A" and "B" Core Spray pumps are injecting into the RPV at full flow.

With these conditions, which ONE of the following represents a potential concern?

- a. Introduction of air into the containment.
- b. Structural damage to the SRV tailpipes.
- c. Failure of the Torus to Drywell vacuum breakers.
- d. Low Pressure ECCS pumps could lose NPSH and cavitate.

## QUESTION 55

Following a Loss of Coolant Accident, which ONE of the following conditions provides Adequate Core Cooling, as defined in the EOP Bases?

- a. RHR Pumps are injecting 5000 gpm.  
RPV Water Level is stable at -30 (minus 30) inches.
- b. A Core Spray Pump is injecting 3200 gpm.  
B Core Spray Pump is available.  
RPV Water Level is stable at -35 (minus 35) inches.
- c. A Core Spray Pump is injecting at 2900 gpm.  
B Core Spray Pump is injecting at 2800 gpm.  
RPV Water Level is stable at -35 (minus 35) inches.
- d. RHR Pumps are injecting 5000 gpm.  
A Core Spray Pump is injecting at 2900 gpm.  
B Core Spray Pump is injecting at 2800 gpm.  
RPV Water Level is stable at -30 (minus 30) inches.

## QUESTION 56

A Group 1 isolation and ATWS have occurred from full power. Reactor Power was 15% after the Recirc Pumps were tripped. LLS is controlling RPV pressure. RPV injection was Terminated and Prevented for Level / Power Control.

The following parameters are reported to the CRS:

- RPV level is at 150 inches.
- Reactor power is at 2%.

The CRS directs reestablishing injection with feedwater.

Is this direction correct? (YES or NO)

If YES, identify the reason it is correct.

If NO, identify the additional considerations necessary to reestablish injection.

- a. NO; Injection must remain terminated until RPV Level lowers to +87 inches.
- b. NO; Injection must remain terminated until RPV Level lowers to +119.5 inches.
- c. YES; Injection may be reestablished when power lowers to <5% and RPV Level lowers to +158 inches.
- d. YES; Injection may be reestablished when power lowers to <5%. There is no restriction on RPV level.

## QUESTION 57

Why does EOP-4, Radioactivity Release Control, require restarting Turbine Building Exhaust Fans?

Restarting Turbine Building Ventilation will:

- a. ensure air is monitored and elevated prior to release to the environment.
- b. provide additional air flow to dilute radioactivity prior to release to the environment.
- c. provide cooling to promote condensation of steam leaks to minimize radioactivity release.
- d. maintain a positive pressure in the Turbine Building to minimize leakage from the Reactor Building.

## QUESTION 58

A plant startup in progress. Reactor is at 70% power. The in plant operator notifies the Control Room Operator that there is a fire in the area of the "A" Reactor Feed Pump.

In accordance with AOP-913, FIRE, what are the MINIMUM actions required?

- a. Reduce Recirc MG Set speed to minimum.
- b. Reduce Recirc Flow to 27 Mlbm/hr, scram the reactor, enter IPOI 5, and secure the "A" Reactor Feed Pump
- c. Reduce power to less than 60% in accordance with IPOI 4, Fast Power Reduction and secure the "A" Reactor Feed Pump.
- d. Reduce power to less than 60% in accordance with the Control Rod Withdrawal Sequence pull sheet and secure the "A" Reactor Feed Pump.

## QUESTION 59

With the plant operating at full power with a normal Drywell Cooling lineup, a leak caused Drywell Pressure and Temperature to increase. Drywell Sprays have been initiated to control Drywell Temperature.

With the Drywell Spray valves open and Drywell Pressure currently at 3.8 psig. What is the status of the Drywell Fans?

All of the Drywell Fans will be:

- a. TRIPPED, with Well Water flow aligned to the coolers.
- b. TRIPPED, with Well Water flow isolated from the coolers.
- c. operating in SLOW speed, with Well Water flow aligned to the coolers.
- d. operating in SLOW speed, with Well Water flow isolated from the coolers.

## QUESTION 60

With the plant operating at full power, a Safety Relief Valve fails OPEN.

To ensure that complete condensation of blowdown steam at the downcomers occurs to prevent exceeding containment load limits following a Loss of Coolant Accident, it is required to immediately SHUTDOWN the reactor if Suppression Pool Temperature approaches:

- a. 95°F
- b. 105°F
- c. 110°F
- d. 120°F

## QUESTION 61

Plant conditions are as follows:

- Reactor Power is 65% and stable.
- RPV Water Level is 189 inches and stable.
- Generator Output is 350 Mwe and stable.

Due to a transient, the following indications are observed:

- Reactor Power is rising steadily.
- RPV Water Level is 180 inches, lowering slowly.
- Generator Output is rising steadily.

Which ONE of the following caused these indications?

- a. The reactor has just experienced a Control Rod Drop accident.
- b. The EHC system is malfunctioning, raising Reactor Pressure.
- c. One or both of the Feed Regulating Valves is failing, raising Feed Flow.
- d. One or both of the Recirc controllers is failing, raising Reactor Recirculation Flow.

## QUESTION 62

Following a reactor scram, the following conditions exist:

- The Reactor Mode Switch is in SHUTDOWN.
- NINE control rods are at position 48.
- EIGHTY control rods are inserted to position 00.
- Reactor Power is 20/40 on IRM Range 5.
- Standby Liquid has NOT been injected.
- BOTH Recirculation Pumps are operating at minimum speed.

Given these conditions, which ONE of the following describes the appropriate method of lowering reactor power?

- a. Inject Standby Liquid Control
- b. Trip Reactor Recirculation Pumps
- c. Insert Control Rods per the Rod Insertion Procedures
- d. Terminate and Prevent Injection to lower RPV Water Level

## QUESTION 63

The plant is shutdown after a transient. Annunciator 1C03A (A-4), OFFGAS VENT PIPE RM-4116A/B HI-HI RAD, activates.

What is the response of the plant and why?

- a. The Offgas system isolates to secure the release.
- b. The Mechanical Vacuum pump trips to ensure that all releases are monitored.
- c. The Offgas Charcoal Absorbers shift into TREAT to ensure Offgas release is treated.
- d. A Group 3 isolation occurs that ensures containment isolation before the maximum allowable 10CFR20 release occurred.

## QUESTION 64

With the plant operating at full power, 1C23C A-6, MAIN PLANT EXHAUST PLENUM HI PRESSURE alarms.

Which ONE of the following actuations results from this condition?

- a. The Reactor Building Supply fans TRIP.
- b. The Reactor Building Exhaust Fans START.
- c. The Standby Gas Treatment Trains START.
- d. The Main Plant Exhaust Fans SHIFT to High Speed.

## QUESTION 65

While operating at full power, 1C14A B-4 AREA WATER LEVELS ABOVE MAX NORMAL, alarms. LI-3769 indicates RCIC Room Water Level is 4 inches.

With these indications, what is the source of the leakage, and what actions are required?

The source of the leakage is the:

- a. Suppression Pool; it is required to enter EOP-2, Primary Containment Control and SHUT RCIC Torus Suction Valves MO-2516 and 2517.
- b. Suppression Pool; it is required to enter EOP-3, Secondary Containment Control and verify area Sump Pumps are operating.
- c. Condensate Storage Tank; it is required to enter EOP-3, Secondary Containment Control, and commence a Reactor Shutdown.
- d. Condensate Storage Tank; it is required to enter EOP-3, Secondary Containment Control and verify area Sump Pumps are operating.

## QUESTION 66

Per OI 264, Reactor Recirculation System, which ONE of the following describes the MINIMUM qualification and coordination requirements for local operation of a Recirculation MG Set Scoop Tube?

- a. A qualified Nuclear Station Plant Equipment Operator may perform scoop tube position adjustment with a Licensed Reactor Operator supervising at the Recirculation MG Set.
- b. A qualified Nuclear Station Plant Equipment Operator in communication with the Main Control Room may perform scoop tube position adjustment
- c. A Licensed Reactor Operator may perform scoop tube position adjustment with a Senior Reactor Operator supervising at the Recirculation MG Set.
- d. A Licensed Reactor Operator in communication with the Main Control Room may perform scoop tube position adjustment.

## QUESTION 67

The reactor is in HOT SHUTDOWN. "B" Loop of RHR is being placed in the Shutdown Cooling Mode.

Which ONE of the following describes how the RHR system is operated during pump starting?

After the first RHR Pump is started, the:

- a. Min Flow Bypass Valve, MO-1935, will be MANUALLY opened until loop flow exceeds 2000 gpm.
- b. Min Flow Bypass Valve, MO-1935, will AUTOMATICALLY open until loop flow exceeds 2000 gpm.
- c. Inboard Inject Valve, MO-1905, will be MANUALLY throttled open until loop flow exceeds 4000 gpm.
- d. Heat Exchanger Bypass, MO-1940, will be MANUALLY throttled open until loop flow exceeds 4000 gpm.

## QUESTION 68

With the plant operating at 100% power, 1C05A D-6, ROD DRIFT alarms. TWO Control Rods are observed moving outward. Reactor Power is rising.

Which ONE of the following actions is required?

- a. Maintain Reactor Power at 100% by LOWERING speed of BOTH Recirc MGs.
- b. Manually Scram the reactor and place the Reactor Mode Switch in SHUTDOWN.
- c. Place individual Scram Test Switches for the malfunctioning Control Rods in TEST.
- d. Select a moving Control Rod and place C11A-S3, Emerg In / Notch Override Select Switch in the EMERG ROD IN position.

## QUESTION 69

With the reactor shutdown, vessel head removed and flooded up and fuel in the vessel, which ONE of the following is considered as a "CORE ALTERATION"?

- a. Replacement of a control rod, with no fuel in the cell.
- b. Withdrawing a control rod between 00 and 48, with fuel in the cell.
- c. Movement of irradiated fuel within the fuel pool, with no activities in the vessel.
- d. Replacement of LPRM detectors, with no movement of fuel bundles or control rods.

## QUESTION 70

A Reactor startup from Cold Shutdown is in progress.

The Estimated Critical Position was calculated based upon the following assumptions:

- Reactor Coolant Temperature at 140°F
- Total Core Flow at 12 Mlbm/hr
- At time of criticality, the reactor will have been shutdown for 40 hours
- Feedwater Temperature 120°F

Which ONE of the below condition will result in criticality occurring later in the rod pull sequence than the Reactor Engineer's calculated Estimated Critical Position?

- a. Feedwater Temperature drops to 100°F.
- b. Criticality occurs 30 hours after shutdown.
- c. Total Core Flow is increased to 15 Mlbm/hr.
- d. Reactor Coolant Temperature drops to 125°F.

## QUESTION 71

During a Refueling Outage with Core Alterations in progress, preparations are being made to completely defuel a reactor cell.

When a cell is completely DEFUELED, the cell must either have a Blade Guide installed OR the associated:

- a. Control Rod Blade must be REMOVED with its HCU charged.
- b. Control Rod must be FULLY WITHDRAWN with its HCU charged.
- c. Control Rod must be FULLY INSERTED with its HCU deactivated.
- d. Control Rod must be FULLY WITHDRAWN with its HCU deactivated.

## QUESTION 72

An area of the Radwaste Building is set aside to store some highly radioactive material. It is determined that the entrance into this area could result in personnel receiving **6 REM** in one hour 30 centimeters from the radiation source.

Which ONE of the following is the correct posting for this area?

- a. Radiation Area
- b. High Radiation Area
- c. Locked High Radiation Area
- d. Very High Radiation Area

## QUESTION 73

The MINIMUM water level in the Spent Fuel Pool is based on which ONE of the following considerations?

The MINIMUM water level in the Spent Fuel Pool ensures:

- a. NPSH for Fuel Pool Cooling pumps.
- b. adequate water inventory to delay boiling in the Spent Fuel Pool following a loss of Fuel Pool Cooling.
- c. absorption of water soluble fission product gasses and transport delays of soluble and insoluble fission product gasses.
- d. adequate water inventory to delay evaporation of soluble Iodine in the Spent Fuel Pool following a loss of Fuel Pool Cooling.

## QUESTION 74

You are a licensed Reactor Operator on dayshift, working on outage tagouts in the Work Control Center. You do not have assigned responsibilities in the Emergency Response Organization (ERO). A transient occurs that results in the declaration of an ALERT Emergency and activation of the Evacuation Alarm.

To which ONE of the following locations do you report?

- a. The Control Room
- b. The Warehouse Assembly Area
- c. The Technical Support Center (TSC)
- d. The Offsite Relocation and Assembly Location (ORAL)

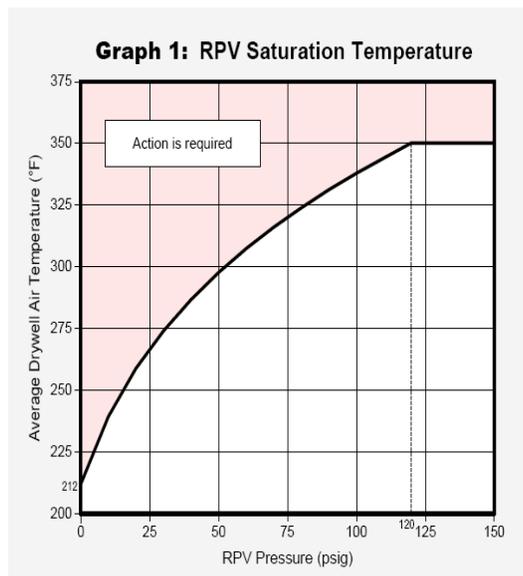
QUESTION 75

Following Emergency Depressurization, the following conditions exist:

- Reactor pressure is 75 psig and lowering.
- Drywell temperature is 350°F and steady.
- Boiling in the instrument reference legs is suspected.

Determine RPV level given the following instrument readings:

- LI 4539 (Wide Range Yarway): 145 inches and steady
- LI-4559 (Narrow Range GEMAC): Downscale
- LI-4541 (Floodup): 180 inches and steady
- LI-4565C (Fuel Zone): 180 inches and steady



- 122 inches
- 135 inches
- 157 inches
- 180 inches

## QUESTION 76

With the plant operating at full power, the following occur:

- 1C07A A-7, TURBINE LUBE OIL BEARING HEADER LO PRESSURE alarms.
- 1C07A C-1, MOTOR SUCTION PUMP 1P-96 RUNNING alarms.
- 1C07A D-6, TURBINE LUBE OIL TANK 1T-1 LO LEVEL alarms.
- Lube Oil Bearing Header Pressure is 5 psig.
- The Main Turbine Generator is still on line.

Which ONE of the following actions are required?

- a. Enter IPOI-4, lower recirc flow to 27 Mlbm/hr and Trip the Main Turbine.
- b. Enter IPOI-5 and manually scram the reactor, TRIP the Main Turbine, and cool down with SRVs, HPCI, or RCIC.
- c. Enter IPOI-5 and manually scram the reactor, TRIP the Main Turbine, and cool down with Main Turbine Bypass Valves.
- d. Enter IPOI-4 and perform a Fast Power Reduction, START the Emergency Bearing Oil Pump and fill the Lube Oil Reservoir.

## QUESTION 77

The plant has scrammed and the following conditions are present:

- 5 Control Rods remain at notch position 24.
- All APRM's are downscale.
- The Reactor Mode Switch has been placed in SHUTDOWN.
- RPV Water Level dropped to 180 inches and then recovered.
- HPCI, RHR, and Core Spray Pumps have automatically started.

Which ONE of the following describes procedures that are to be used?

- a. IPOI-5, Reactor Scram ONLY
- b. ATWS RPV Control and EOP-2, Primary Containment Control
- c. EOP-1, RPV Control, and EOP-2, Primary Containment Control
- d. IPOI-5, Reactor Scram and RIP 103.3, Manually Drive Control Rods

## QUESTION 78

The Main Control Room has been evacuated due to a fire.

Torus Water Temperature is 106°F.

Where can Torus Water Temperature be obtained, and what action is required due to Torus Water Temperature?

Torus Water Temperature is obtained at:

- a. Remote Shutdown Panel, 1C-388; it is required to maximize Torus Cooling with B RHR Loop IAW AOP-915, Shutdown Outside Control Room.
- b. Remote Shutdown Panel, 1C-388; it is required to maximize Torus Cooling with B RHR Loop IAW OI-149, Residual Heat Removal System.
- c. Remote Shutdown Panel, 1C-392; it is required to maximize Torus Cooling with B RHR Loop IAW AOP-915, Shutdown Outside Control Room.
- d. Remote Shutdown Panel, 1C-392; it is required to maximize Torus Cooling with B RHR Loop IAW OI-149, Residual Heat Removal System.

## QUESTION 79

The reactor is in Mode 4, COLD SHUTDOWN, with the following conditions:

- BOTH Recirculation Loops are shutdown.
- RPV Water Level is 190 inches.
- Reactor Coolant Temperature is 140°F.
- RHR Loop B is operating in Shutdown Cooling Mode.

A leak developed in RHR Loop B piping, causing RPV Water Level to lower until an automatic isolation stabilized RPV Water Level.

What is the status of RHR, and what action satisfies Technical Specification requirements?

- a. ONLY RHR Loop B is affected by isolation valve closure; starting a Reactor Recirculation Pump will satisfy Technical Specifications.
- b. BOTH RHR Loops are affected by isolation valve closure; starting a Reactor Recirculation Pump will satisfy Technical Specifications.
- c. ONLY RHR Loop B is affected by isolation valve closure; starting RHR Pumps in RHR Loop B will satisfy Technical Specifications.
- d. BOTH RHR Loops are affected by isolation valve closure; raising RPV Water Level to the Main Steam Lines will satisfy Technical Specifications.

## QUESTION 80

Plant conditions are as follows:

- A Loss of Coolant Accident is in progress.
- Drywell Pressure is 29 psig and rising.
- Torus Pressure is 28 psig and rising.
- Torus Water Level is 13 feet and stable.
- Torus Water Temperature is 82°F and stable.
- Containment Spray is inoperable.
- RPV level is being maintained with RHR and Core Spray.

Which ONE of the following describes the required actions and the reason based on the above conditions?

- a. Perform a normal cooldown because ECCS NPSH and Vortex Limits are being exceeded.
- b. Perform a normal cooldown because steam is bypassing the Drywell to Torus downcomers.
- c. Perform an Emergency Depressurization because ECCS NPSH and Vortex Limits are being exceeded.
- d. Perform an Emergency Depressurization because steam is bypassing the Drywell to Torus downcomers.

## QUESTION 81

With the plant operating at 100% power, the following alarms occurred sequentially:

- 1C06B C-3 "A" RX FEED PUMP 1P-1A TRIP OR MOTOR OVERLOAD
- 1C05A D-1 REACTOR VESSEL HI/LO LEVEL RECORDER ALARM

What effect will this have on reactor power, and what actions are required?

Reactor Power initially lowered due to an automatic:

- a. Reactor Scram; it is required to enter IPOI-5 and verify a Main Turbine Trip.
- b. Recirc Runback; it is required to manually SCRAM the reactor and enter IPOI-5.
- c. Reactor Scram; it is required to enter IPOI-5 and verify PCIS Group 2, 3, and 4 isolations.
- d. Recirc Runback; it is required to stabilize RPV Water Level and evaluate current conditions per the Power/Flow Map.

## QUESTION 82

Following a transient, the following conditions exist:

- 20 Control Rods are at position 00.
- 69 Control Rods are not fully inserted.
- Reactor Power is 6% on APRMs.
- RPV Water Level has been lowered to the lowest permissible band.
- Emergency Depressurization is required due to Primary Containment conditions.

With these conditions, which ONE of the following RPV Water Level strategies is required to be directed?

- a. Terminate and Prevent Injection per ATWS-RPV Control.
- b. Slowly inject into the RPV as soon as RPV pressure equals low pressure ECCS pump shutoff head.
- c. Maintain RPV Water Level ABOVE +15 inches per EOP-1, RPV Control.
- d. Maintain RPV Water Level BETWEEN -25 inches to +15 inches per ATWS-RPV Control.

## QUESTION 83

Following a plant transient, a steam leak from Main Steam Drain Line has occurred in the Turbine Building. RPV Water Level lowered to 120 inches and recovered. Efforts to isolate the leak have not been successful. The following conditions exist:

- Turbine Building Heater Bay Area Temperature is 185°F.
- Turbine Building Kaman 1/2 indicates 3E-1 ( $3.0 \times 10^{-1}$ )  $\mu\text{Ci/mlcc}$ , rising.
- Reactor Building Kaman 3/4 indicates 2E-2 ( $2.0 \times 10^{-2}$ )  $\mu\text{Ci/mlcc}$ , rising.
- Reactor Building Kaman 5/6 indicates 4E-2 ( $4.0 \times 10^{-2}$ )  $\mu\text{Ci/mlcc}$ , rising.
- Reactor Building Kaman 7/8 indicates 3E-2 ( $3.0 \times 10^{-2}$ )  $\mu\text{Ci/mlcc}$ , rising.

With these indications, it is required to:

- a. Enter EOP-3 Secondary Containment Control and restart Reactor Building Ventilation.
- b. Enter EOP-3 Secondary Containment Control and verify Standby Gas Treatment Trains have started.
- c. Enter EOP-4, Radiation Release Control and perform an Emergency Depressurization.
- d. Enter EOP-4, Radiation Release Control and commence a normal plant shutdown per IPOI-4, Shutdown.

## QUESTION 84

The plant is operating at full power, when the following conditions occur:

- RWCU Pump Room Radiation, RI-9156, is 1500 mr/hr.
- RWCU Pump Room Temperature is 125°F, rising.
- Fuel Pool Exhaust Radiation is 10 mr/hr.
- NO actuations have occurred.

Which ONE of the following actions is required FIRST?

- a. Enter EOP-1, RPV Control and SCRAM the reactor.
- b. Enter EOP-3, Secondary Containment Control and START SBTG.
- c. Enter EOP-3, Secondary Containment Control and ISOLATE RWCU.
- d. Enter Emergency Depressurization and OPEN 4 Safety Relief Valves.

## QUESTION 85

With the plant operating at 100% power, a fire was discovered in the Reactor Building.

The fire was extinguished with the deluge system, resulting in these conditions:

- HPCI Room Temperature is 160°F.
- HPCI Room Water Level is 3 inches.

It is required to direct which ONE of the following actions?

It is required to:

- a. enter IPOI-5, Reactor Scram and perform a Plant Shutdown.
- b. enter Emergency Depressurization and open 4 Safety Relief Valves.
- c. enter EOP-3, Secondary Containment Control, and isolate the deluge system
- d. enter EOP-1, RPV Control, and anticipate Emergency Depressurization.

## QUESTION 86

A loss of coolant accident with a total loss of feed water is in progress. HPCI is injecting at rated flow into the RPV maintaining level in the normal band. An unisolable leak develops in the torus resulting in torus level lowering one inch per minute.

Which one of the following describes the actions that must be taken as a result of the lowering torus level regarding the HPCI system?

- a. At 7.1 feet the HPCI system must be secured REGARDLESS of Adequate Core Cooling.
- b. At 5.8 feet the HPCI system must be secured UNLESS required for Adequate Core Cooling.
- c. At 7.1 feet, the RPV must be emergency depressurized causing HPCI to isolate on low steam line pressure.
- d. At 4.5 feet HPCI must be secured due to exceeding the Heat Capacity Temperature Limit curve.

## QUESTION 87

Preparations are being made for a reactor startup per IPOI-1, Startup Checklist. While performing STP NS780103, SRM/IRM Detector Not In Startup Position Functional Test, it is noted that Intermediate Range Detectors B and D will NOT drive to the FULL IN position.

Which ONE of the following describes the impact of this condition on transitioning from MODE 4, COLD SHUTDOWN, to MODE 2, STARTUP per IPOI-1, Startup Checklist and Technical Specifications?

LCO 3.3.1.1, RPS Instrumentation requirements are:

- a. LCO 3.3.1.1, RPS Instrumentation requirements are satisfied to transition to MODE 2. The IRM Rod Block CAN be BYPASSED.
- b. LCO 3.3.1.1, RPS Instrumentation requirements are satisfied to transition to MODE 2, but the IRM Rod Block CANNOT be BYPASSED until ONE IRM is restored OPERABLE.
- c. LCO 3.3.1.1, RPS Instrumentation requirements are NOT satisfied. As a MINIMUM, it is required to restore BOTH IRMs OPERABLE to transition to MODE 2, STARTUP.
- d. LCO 3.3.1.1, RPS Instrumentation requirements are NOT satisfied. As a MINIMUM, it is required to restore ONE IRM OPERABLE to transition to MODE 2, STARTUP.

## QUESTION 88

With a Station Blackout in progress, Reactor Core Isolation Cooling was manually started. Conditions are as follows:

- HPCI is NOT available.
- RPV Water Level reached a minimum of 160 inches and is lowering.
- Reactor Pressure is 200 psig.
- Torus Water Temperature is 130°F, rising.
- Torus Water Level is 10.5 feet.
- Drywell Pressure is 1.8 psig.
- RCIC Room Temperature is 170°F, rising.

Which ONE of the following describes the ACTIONS taken in accordance with AOP-301.1, which will preserve RCIC operation under these conditions?

- a. DEFEAT 1 will be installed to BYPASS the RCIC Low RPV Pressure Isolation.  
DEFEAT 2 will be installed to BYPASS RCIC Suction Transfer to the Torus.
- b. DEFEAT 1 will be installed to BYPASS the RCIC Low RPV Pressure Isolation.  
DEFEAT 18 will be installed to BYPASS RCIC High Temperature Isolations.
- c. DEFEAT 2 will be installed to BYPASS RCIC Suction Transfer to the Torus.  
LOWER RPV Pressure to below 150 psig, to reduce load on the RCIC Turbine.
- d. DEFEAT 18 will be installed to BYPASS RCIC High Temperature Isolations.  
LOWER RPV Pressure to below 150 psig, to reduce load on the RCIC Turbine.

## QUESTION 89

The plant is in MODE 3 at 600 psig. Core Spray Pump A full flow testing is in progress. The Assistant Nuclear Station Operating Engineer (ANSOE) reports that 1C03A B-6, ADS CORE SPRAY OR RHR PUMP RUNNING PERMISSIVE alarm does NOT actuate with Core Spray Pump A operating. ALL OTHER expected alarms actuated.

- Core Spray Pump A Discharge Pressure is 160 psig.
- Core Spray Pump A Flow is 3200 gpm.

Which ONE of the following describes the Technical Specifications impact of this condition?

- a. "A" Core Spray pump is INOPERABLE due to developing sufficient flow
- b. "A" Core Spray pump is INOPERABLE due to developing insufficient discharge pressure.
- c. "A" ADS logic is INOPERABLE due to failure of the "A" Core Spray pump discharge pressure switch.
- d. "A" and "B" ADS logic are INOPERABLE due to failure of the "A" Core Spray pump discharge pressure switch.

## QUESTION 90

With the plant operating at full power, an electrical failure resulted in these alarms:

- 1C08A A-1 AUX XFMR TO 1A1 BREAKER 1A101 TRIP
- 1C08A A-3 S/U XFMR TO 1A1 BREAKER 1A102 TRIP

Which ONE of the following describes the affect of these events on the Standby Gas Treatment System (SBGT), and what actions are required?

- a. RPV Low Water Level will start BOTH SBGT Trains; it is required to enter EOP-1, RPV Control and verify proper SBGT operation.
- b. RPV Low Water Level will start ONE SBGT Train; it is required to enter EOP-1, RPV Control and verify proper SBGT operation.
- c. Loss of Radiation Monitor power will initiate BOTH SBGT Trains; it is required to enter AOP 317, Loss of 120 VAC Instrument Control Power and secure one SBGT Train.
- d. Loss of Radiation Monitor power will initiate ONE SBGT Train; it is required to enter AOP 317, Loss of 120 VAC Instrument Control Power and verify proper SBGT operation.

QUESTION 91

The plant is operating at full power when the following occurs:

- 1C06B D-3, RBCCW PUMP DISCH HEADER LO PRESSURE alarms.
- 1C04B A-9, RWCU PUMP LO FLOW alarms.
- 1C04B C-9, RWCU FILTER/DEMIN INLET WATER HI TEMP alarms.
- 1C04B D-9, RWCU FILTER/DEMIN INLET WATER HI HI TEMP alarms.
- NO RBCCW Pumps are operating.
- 480V Bus 1B4 Breaker 1B402 feed to MCC 1B43 has tripped due to a fault.
- RBCCW Pump 1P-81A WILL NOT start.

WHICH ONE of the following describes the status of the RWCU system TEN MINUTES later and the required procedural action?

	<u>STATUS of RWCU</u>	<u>REQUIRED PROCEDURAL ACTION</u>
a.	RWCU Filter Demineralizers will be IN HOLD and RWCU WILL NOT be ISOLATED.	OPEN MO-2723, CLEANUP DEMIN BYPASS valve and restart RWCU Pumps per ARP 1C04B A-9, RWCU PUMP LO FLOW.
b.	RWCU Filter Demineralizers will be IN HOLD and RWCU WILL be ISOLATED.	VERIFY a complete PCIS Group 5 Isolation per ARP 1C04B D-9, RWCU FILTER/DEMIN INLET WATER HI-HI TEMP.
c.	RWCU Filter Demineralizers will be IN HOLD and RWCU WILL be ISOLATED.	SCRAM the reactor per ARP 1C06B D-3, RBCCW PUMP DISCH HEADER LO PRESSURE.
d.	RWCU Filter Demineralizers will be IN SERVICE and RWCU WILL NOT be ISOLATED.	OPEN MO-2723, CLEANUP DEMIN BYPASS valve to protect RWCU Filter Demineralizers per ARP 1C04B C-9, RWCU FILTER/DEMIN INLET WATER HI TEMP.

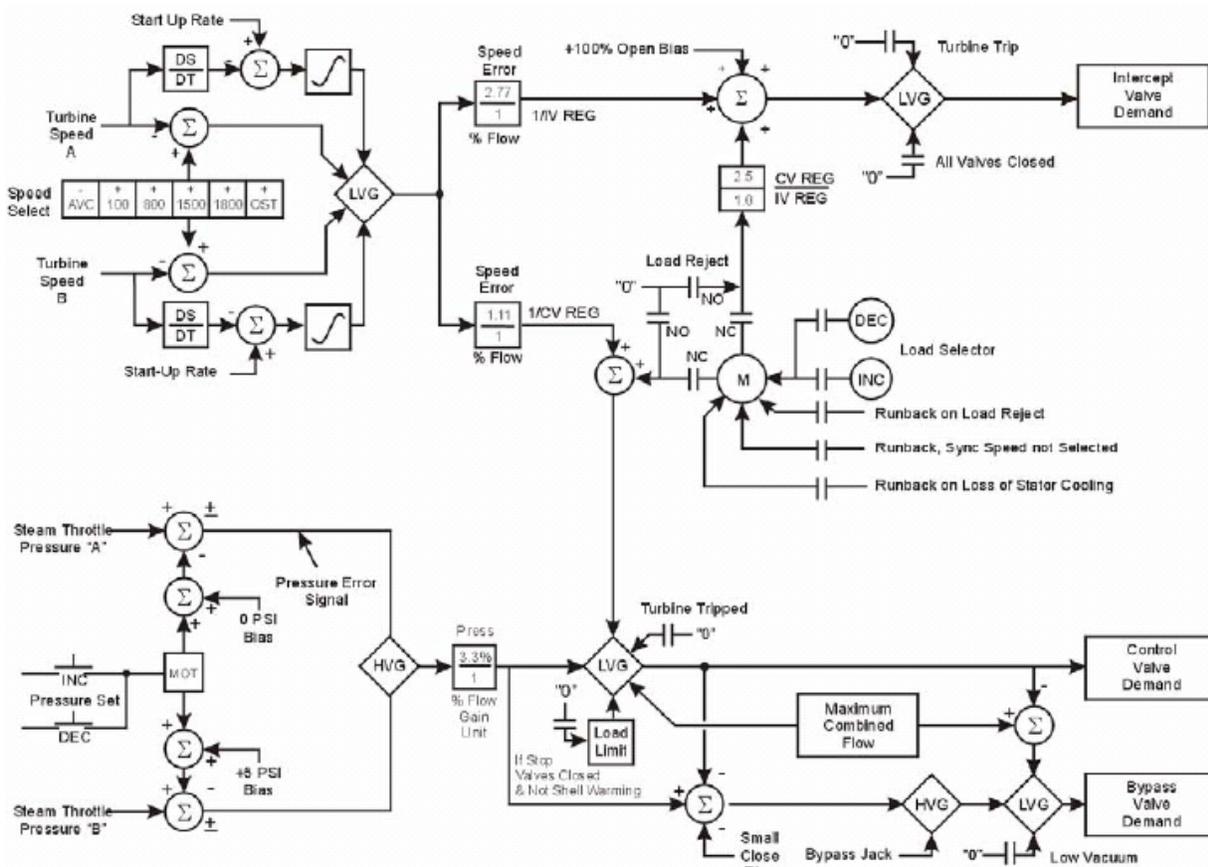
QUESTION 92

With the plant operating at 100% power, the pressure sensing line to Steam Throttle Pressure A transmitter ruptures resulting in 0 psig input to Pressure Regulator Channel A.

Which ONE of the following will result from this failure, and what actions are required?

- a. Reactor Pressure will RISE 5 psig. It is required to enter AOP-262, Loss of Reactor Pressure Control and verify Core Thermal Limits.
- b. Reactor Pressure will LOWER 5 psig. It is required to enter AOP-262, Loss of Reactor Pressure Control and verify Core Thermal Limits.
- c. Reactor Pressure will RISE resulting in a Reactor Scram. It is required to enter EOP-1, RPV Control and verify all control rods are inserted.
- d. Reactor Pressure will LOWER resulting in a Group 1 Isolation and a Reactor Scram. It is required to enter EOP-1, RPV Control and verify all control rods are inserted.

**EHC Logic Control System**



## QUESTION 93

With the plant operating at full power, the following indications occur:

- 1C08C D 4 H2 STATOR COOLING PANEL 1C-83 TROUBLE alarms.
- 1C83A B 2 CONDUCTIVITY ABOVE 9.9 MICROMHOS alarms.

Using these indications, what actions should be directed, and what procedure will be entered?

- a. VERIFY an AUTOMATIC Turbine Trip has occurred, and enter IPOI-5, Reactor Scram.
- b. LOWER Generator Load to 4000 Stator Amps using IPOI 3, Power Operations (35% - 100% Rated Power).
- c. FLUSH the Stator Cooling Water System for 30 minutes using OI 697, Generator Stator Cooling Water System.
- d. LOWER Recirculation Flow to 27 Mlbm/hr using IPOI 4 Section 6.0, Rapid Power Reduction, Scram the Reactor and Manually Trip the Turbine Generator.

## QUESTION 94

The plant was operating at 93% power. The only equipment problem was a failed FULL-IN reed switch on one control rod.

From the above condition, there was a COMPLETE LOSS OF UNINTERRUPTIBLE AC POWER that resulted in a reactor scram.

EOP-1, RPV Control, has been entered due to RPV low level during the initial transient:

- All 8 RPS Scram Group A and B white lights are OFF.
- The 1C05 operator has reported that he cannot confirm that all rods are fully inserted.
- On the 1C05 Full Core Display, all LPRM downscale lights are ON.
- All IRMs are fully inserted, on Range 3 or 4, reading midscale, and lowering on all available indications.
- RPV pressure is 900 psig and lowering slowly with all available Main Steam Lines Drains open.
- Standby Liquid Control (SBLC) was NOT injected.
- There are no challenges to Containment.

Which of the following correctly describes how the CRS shall utilize the IPOI-5, "Reactor Scram", EOP-1, and the ATWS EOP procedures when directing further operator actions in this situation?

- a. ALL operator actions will be directed from EOP-1 and IPOI-5.  
NO operator actions will be directed from the ATWS EOP.
- b. Operator actions for reactivity control will be directed from the ATWS EOP. Operator actions for RPV level and pressure will be directed from EOP-1.
- c. Operator actions for reactivity control will be directed from IPOI-5.  
Operator actions for RPV Pressure and Level will be directed from the ATWS EOP.
- d. NO operator actions will be directed from either EOP-1 or IPOI-5.  
ALL operator actions will be directed from the ATWS EOP.

## QUESTION 95

Which ONE of the following results in a violation of the Reactor Core Safety Limits?

- a. During an RFO, with the core completely off loaded and the FP gates installed, the RPV is inadvertently drained to +10 inches.
- b. While at 100% power, the hourly 3D edit shows MFLCPR at 1.08.
- c. While in Mode 2 with RPV pressure at 575 psig, an ARPM HIGH FLUX SCRAM occurs at 28% power.
- d. While in Mode 1, a full Group I isolation occurs, a reactor scram occurs due to high RPV pressure at 1055 psig.

## QUESTION 96

The plant is operating at 8% power during a STARTUP.

A Secondary Containment penetration flowpath with an INOPERABLE automatic damper has been isolated by closing and isolating the air supply to the damper. The redundant isolation valve is OPEN.

Maintenance has been completed and Post Maintenance Testing requires the damper to be reopened and automatically close upon the receipt of a Group 3 isolation signal.

Which ONE of the following actions is REQUIRED to perform the PMT?

It is required to:

- a. enter LCO 3.0.3, complete the Post Maintenance Test, then exit LCO 3.0.3.
- b. perform the Post Maintenance Test without any restrictions, because the plant is not in the mode of applicability.
- c. enter LCO 3.0.5, station a dedicated operator in continuous communication with the control room at the damper to perform this Post Maintenance Test, then exit LCO 3.0.5.
- d. open the valve, start the Standby Gas Treatment System using the SBGT TEST pushbutton (PB 5831) on 1C24, verify the PCIS Group III isolation is complete, perform the Post Maintenance Test, then secure the Standby Gas Treatment System.

## QUESTION 97

Which of the following can be used during venting the containment irrespective of radiation release but does NOT require plant entry?

- a. SEP 301.1, Torus Vent Via SBGT
- b. SEP 301.3, Torus Vent Via Hardpipe Vent
- c. SEP 303.1, Air Purge for H<sub>2</sub> Control in SAGs
- d. SEP 303.2, N<sub>2</sub> Purge for H<sub>2</sub> Control in SAGs

## QUESTION 98

Which ONE of the following is the LOWEST expected exposure that REQUIRES an ALARA RWP Review?

- a. 0.05 man Rem
- b. 1.0 man Rem
- c. 2.0 man Rem
- d. 5.0 man Rem

## QUESTION 99

Radiography is in progress near the CRD accumulators on the south end. During the radiography, 1C04 A-6, REACTOR BLDG. ARM HI RAD annunciator alarms. An operator checks the ARM readings and informs the CRS that RI-9169, South CRD Area Module Area ARM is reading 200 mr/hr.”

Which ONE of the following is the correct response to this condition?

- a. EOP-3 must NOT be entered, since the evolution was preplanned and this was a possible condition that could occur.
- b. EOP-3 must be entered and actions must be taken until RI-9169, South CRD Area Module Area High Radiation ARM reading is clear.
- c. EOP-3 must be entered due to RI-9169, South CRD Area Module Area High Radiation ARM alarming. EOP-3 can be exited if no emergency exists. No other actions are required.
- d. EOP-3 must be entered due to RI-9169, South CRD Area Module Area High Radiation ARM alarming. EOP-3 can be exited if no emergency exists. The EOP entry and exit must be logged into CRS Logs.

## QUESTION 100

The plant is operating at 95% power when the following occurs:

- At 0930, the in plant operator notifies the control room that there is a fire in the High Pressure Coolant Injection (HPCI) room.
- At 0933, 1C40 C-2, HPCI ROOM DELUGE NO. 2 INITIATED illuminates. This is a red alarm window.
- At 0940, the Fire Brigade informs the control room that they are on the scene fighting the fire.
- At 0948, the Fire Brigade reports to the control room that the fire is out.

By what time must the Control Room Supervisor (CRS) have determined the appropriate Emergency Action Level (EAL)?

- a. 0945
- b. 0948
- c. 0955
- d. 1003

## Examination References

Question # 001  
 Answer: A  
 Reference:  
 EOP Bases Curves and Limits Rev 8  
 New  
 Higher  
 K/A#: 203000K3.02

Question# 006 Answer: A  
 Reference:  
 ARP 1C03A B-8, rev 44  
 Tech Spec Bases B3.5.1  
 NEW  
 HIGHER  
 K/A#: 209001K5.05

Question # 002  
 Answer : D  
 Reference:  
 TS Basis B3.4.9  
 New  
 Higher  
 Steam Table Required  
 K/A#: 205000A4.07

Question # 007  
 Answer: A  
 Reference:  
 AOP-301.1 Rev 36 Step 7 of Restoration of  
 offsite power (p16 of 31)  
 MODIFIED  
 HIGHER  
 K/A#: 262001 2.1.28

Question # 003  
 Answer: D  
 Reference Documents  
 HPCI SD and SD 880  
 Tech Spec Bases B3.3.5.1  
 NEW  
 HIGHER  
 K/A#: 206000K6.11

Question# 008  
 Answer: D  
 Reference:  
 OI 153 Rev 34  
 MODIFIED  
 HIGHER  
 K/A#: 211000A3.08

Question # 004  
 Answer: C  
 Reference:  
 SD 152, HPCI  
 SD 183.1, ADS  
 BANK  
 HIGHER  
 K/A#: 206000K3.02

Question# 009  
 Answer: A  
 Reference:  
 SD 358, SD 264  
 BANK  
 HIGHER  
 K/A# 212000A4.15

Question # 005  
 Answer: B  
 Reference:  
 OI-878.2 Rev 23  
 BANK  
 FUNDAMENTAL  
 K/A# 215003K4.05

Question# 010  
 Answer: B  
 Reference:  
 ARP 1C05B A-1, Rev 77, EOP-1, EOP-2  
 NEW  
 HIGHER  
 K/A# 212000 2.4.2

Question# 011  
Answer: B  
Reference:  
ARP 1C05A B-3, Rev 59  
BANK  
HIGHER  
K/A# 215003A3.04

Question# 012  
Answer: D  
Reference:  
SD 878.1 Rev 5  
NEW  
FUNDAMENTAL  
K/A# 215004K1.01

Question# 013  
Answer: D  
Reference:  
SD 878.3 Rev 9  
BANK  
HIGHER  
K/A# 215005K4.07

Question #: 014  
Answer: D  
Reference:  
OI 150 Rev 65  
BANK  
HIGHER  
K/A# 217000A4.04

Question #: 015  
Answer: C  
Reference:  
SD 183.1  
NEW  
FUNDAMENTAL  
K/A#: 218000K4.04

Question #: 016  
Answer: B  
K/A #: 218000K5.01  
NEW  
HIGHER  
Reference:  
OI 183.1 Rev 30  
K/A#: OI 183.1 Rev 30

Question #: 017  
Answer: D  
Reference:  
AOP-358 Rev 26  
BANK  
HIGHER  
K/A#: 223002A2.01

Question #: 018  
Answer: A  
Reference:  
SD-183.1, Rev 7  
BANK  
HIGHER  
K/A #: 239002K2.01

Question#: 019  
Answer: A  
Reference:  
ARP 1C03C C-9, Rev 38  
NEW  
FUNDAMENTAL  
K/A#: 259002K2.02

Question#: 020  
Answer: D  
Reference:  
SD 170  
NEW  
HIGHER  
K/A #: 261000A2.05

Question#: 021  
Answer: C  
Reference:  
SD 304  
NEW  
HIGHER  
K/A #: 262001K1.03

Question #: 022  
Answer: C  
Reference:  
AOP 317 Rev 75  
NEW  
FUNDAMENTAL  
K/A #: 262002K3.10

Question#: 023  
Answer: B  
Reference:  
SD-375 Rev 7  
NEW  
HIGHER  
K/A #: 263000K6.01

Question#: 024  
Answer: A  
NEW  
Include OI 324 Appendix 1  
OI 324 Rev 82  
HIGHER  
Reference:  
K/A #: 264000A1.03

Question #: 025  
Answer: B  
Reference  
AOP 518 Rev 29  
ARP 1C07B (B-10)  
NEW  
HIGHER  
K/A #: 300000A2.01

Question#: 026  
Answer: B  
Reference:  
ARP 1C06B D-2 Rev 42  
NEW  
HIGHER  
K/A # 400000A1.04

Question#: 027  
Answer: D  
Reference  
SD-644 Rev 8  
BANK  
HIGHER  
K/A #: 259001A3.04

Question#: 028  
Answer: C  
Reference:  
IPOI-2, P&L 24  
TS LCO 3.2.1.1 C.2.2 Amendment 223  
NEW  
FUNDAMENTAL  
K/A #: 201006 2.1.33

Question #: 029  
Answer: D  
Reference:  
SD 264  
BANK  
FUNDAMENTAL  
K/A#: 202002K1.03

Question #: 030  
Answer: B  
Reference:  
ARP 1C04B C-8, D-9  
NEW  
HIGHER  
K/A#: 204000K5.04

Question#: 031  
Answer: B  
Reference:  
SD 149 Rev 10  
MODIFIED  
HIGHER  
K/A#: 203000A1.01

Question#: 032  
Answer: D  
Reference:  
1C07A A-2, Rev 31  
1C06B C-3, Rev 42  
NEW  
HIGHER  
K/A#: 216000K3.16

Question#: 033  
Answer: D  
Reference:  
ARP 1C04A D-2 and 8 Rev 50  
NEW  
HIGHER  
K/A#: 202002A2.06

Question#: 034  
Answer: B  
Reference:  
OI 149 Rev 102  
SD 149  
NEW  
FUNDAMENTAL  
K/A#: 233000K2.02

Question#: 035  
Answer: A  
Reference:  
SD 281, Rev 4  
BANK  
HIGHER  
K/A#: 234000K4.02

Question#: 036  
Answer: C  
K/A: 245000K6.06  
NEW  
HIGHER  
Reference:  
ARP 1C07A A-1 Rev 31  
K/A#: 245000K606

Question#: 037  
Answer: D  
Reference  
ARP 1C04B B-4 Rev 65  
NEW  
FUNDAMENTAL  
K/A#: 288000A4.02

Question#: 038  
Answer: D  
Reference:  
ARP 1C26A C-2 Rev 45  
NEW  
FUNDAMENTAL  
K/A#: 290003 2.4.10

Question#: 039  
Answer: B  
Reference:  
AOP 255.2 Rev 28  
BANK  
HIGHER  
Provide Power to Flow Map  
K/A#: 295001AA1.05

Question#: 040  
Answer: C  
Reference:  
SD 304  
ARP 1C08B, A-11, Rev 73  
BANK  
HIGHER  
K/A#: 295003AA1.02

Question#: 041  
Answer: A  
Reference:  
ARP 1C03C C-9 Rev 36  
EOP-1 Rev 14  
BANK  
HIGHER  
K/A#: 295004 2.4.6

Question#: 042  
Answer: C  
Reference:  
IPOI 4, Rev 86  
MODIFIED  
HIGHER  
K/A#: 295005AK2.02

Question#: 043  
Answer: A  
Reference:  
SD 959-1 Rev 7  
BANK  
HIGHER  
K/A#: 295006AK1.01

Question#: 044  
Answer: C  
Reference:  
AOP 915 Rev 35  
NEW  
FUNDAMENTAL  
K/A#: 295016AA1.03

Question#: 045  
Answer: A  
Reference:  
OI 408 P&L 3 Rev 71  
BANK  
HIGHER  
K/A#: 295018AK1.01

Question#: 046  
Answer: C  
Reference:  
AOP 518 Rev 29  
NEW  
HIGHER  
K/A#: 295019 2.1.32

Question#: 047  
Answer: A  
Reference:  
AOP 149 Rev 25  
NEW  
FUNDAMENTAL  
K/A#: 295021AK3.05

Question#: 048  
Answer: B  
Reference:  
Not Provided  
NEW  
FUNDAMENTAL  
K/A#: 295023AA2.01

Question#: 049  
Answer: C  
Reference:  
EOP-2 Bases  
PSP Graph 5 provided without title  
NEW  
HIGHER  
K/A#: 295024EA2.03

Question#: 050  
Answer: A  
Reference:  
EOP-1 RPV Control Rev 14  
EOP-1 Bases, Rev 12  
NEW  
FUNDAMENTAL  
K/A#: 295025EK3.03

Question#: 051  
Answer: B  
Reference:  
EOP-1 Bases Rev 12  
NEW  
HIGHER  
K/A#: 295026EA2.03

Question#: 056  
Answer: A  
Reference:  
EOP ATWS RPV Control Rev 16  
BANK  
HIGHER  
K/A# 295037EK1.02

Question#: 052  
Answer: B  
Reference:  
AOP-388 Rev 18  
BANK  
FUNDAMENTAL  
K/A#: 295004AK2.03

Question#: 057  
Answer: A  
Reference:  
EOP 4 Bases Rev 8  
NEW  
FUNDAMENTAL  
K/A#: 295038 2.1.32

Question#: 053  
Answer: C  
Reference:  
EOP-2 Bases Document, Rev 12  
NEW  
FUNDAMENTAL  
K/A#: 295028EK2.02

Question#: 058  
Answer: C  
Reference:  
AOP 913 Rev 49  
NEW  
HIGHER  
K/A#: 600000 2.1.20

Question#: 054  
Answer: D  
Reference:  
EOP Cautions Bases, Rev 8  
BANK  
FUNDAMENTAL  
K/A#: 295030EK3.07

Question#: 059  
Answer: A  
Reference:  
OI 760 Rev 25  
NEW  
HIGHER  
K/A#: 295012AA1.01

Question#: 055  
Answer: B  
Reference:  
EOP Bases Document Rev 8  
Flow Chart Use & Logic section  
NEW  
FUNDAMENTAL  
K/A#: 295031EK3.03

Question#: 060  
Answer: C  
Reference:  
TS Bases 3.6.2.1 Amendment 223  
NEW  
FUNDAMENTAL  
K/A#: 295013AK1.04

Question#: 061  
Answer: D  
Reference:  
AOP 255.2 Rev 28  
BANK  
HIGHER  
K/A#: 295014AA2.03

Question#: 066  
Answer: D  
Reference:  
OI-264 Rev 99  
NEW  
FUNDAMENTAL  
K/A#: 2.1.8

Question#: 062  
Answer: C  
Reference:  
EOP ATWS Bases Rev 11  
NEW  
HIGHER  
K/A#: 295015AA2.01

Question#: 067  
Answer: D  
Reference:  
OI-149 Rev 102  
NEW  
FUNDAMENTAL  
K/A#: 2.1.2

Question#: 063  
Answer: D  
Reference:  
Tech Specs Bases 3.3.6.1  
NEW  
FUNDAMENTAL  
K/A#: 295017AK3.01

Question#: 068  
Answer: B  
Reference:  
ARP 1C05A D-6 Rev 59  
NEW  
FUNDAMENTAL  
K/A#: 2.1.20

Question#: 064  
Answer: A  
Reference:  
ARP 1C23C Rev 44  
NEW  
FUNDAMENTAL  
K/A#: 295035 2.4.31

Question#: 069  
Answer: B  
Reference:  
RFP 403 Rev 29  
BANK  
FUNDAMENTAL  
K/A#: 2.2.28

Question#: 065  
Answer: D  
Reference:  
ARP 1C14A B-4 and EOP-3, Secondary  
Containment Control Rev 19  
NEW  
HIGH  
K/A#: 295036EK2.03

Question#: 070  
Answer: B  
Reference:  
GFE Chapter 6, Fission Product Poisons  
BANK  
FUNDAMENTAL  
K/A#: 2.2.34

Question#: 071  
Answer: D  
Reference:  
RFP 403 Rev 29 page 8  
NEW  
HIGHER  
K/A#: 2.2.26

Question#: 072  
Answer: C  
Reference:  
NEW  
FUNDAMENTAL  
ACP 1411.3 Control of LHRA Rev 21  
K/A#: 2.3.1

Question#: 073  
Answer: C  
Reference:  
Tech Spec Bases B3.7.8  
NEW  
FUNDAMENTAL  
K/A#: 2.3.10

Question#: 074  
Answer: A  
Reference:  
EPIP 2.5 Rev 17  
BANK  
FUNDAMENTAL  
K/A#: 2.4.39

Question#: 075  
Answer: C  
Reference:  
EOP Caution 1 Rev 14  
Provide Saturation Curve  
BANK  
HIGHER  
K/A#: 2.4.20

Question#: 076  
Answer: B  
Reference:  
AOP 693 Rev 10  
NEW  
HIGHER  
K/A#: 295005 2.4.11

Question#: 077  
Answer: B  
Reference:  
EOP-2 Rev 14  
ATWS RPV Control Rev 16  
BANK  
HIGHER  
K/A#: 295006 2.4.4

Question#: 078  
Answer: A  
Reference:  
EOP-2 Rev 14  
AOP 915 Rev 35  
NEW  
HIGHER  
K/A#: 295016AA2.04

Question#: 079  
Answer: B  
Reference:  
TS LCO 3.4.8 Amendment 223, 234  
NEW  
HIGHER  
K/A#: 295021AA2.07

Question#: 080  
Answer: D  
Reference:  
EOP-2 Rev 14, EOP-2 Bases, Rev 12  
PROVIDE EOP-2 GRAPH 5  
BANK  
HIGHER  
K/A#: 295024EA2.04

Question#: 081  
Answer: B  
Reference:  
ARP 1C06B C-3 Rev 42  
NEW  
HIGHER  
K/A#: 295031EA2.02

Question#: 082  
Answer: A  
Reference:  
EOP ATWS Bases Rev 11  
NEW  
HIGHER  
K/A#: 295037 2.4.7

Question#: 083  
Answer: C  
Reference:  
EOP-4 Rev 19  
Provide Reference EPIP Form EAL 01  
PROVIDE EOP-3 Temperature Table  
PROVIDE EOP-3 Table 6  
NEW  
HIGHER  
K/A#: 295017AA2.03

Question#: 084  
Answer: B  
Reference:  
EOP-3 Rev 19  
NEW  
HIGHER  
K/A#: 295033EA2.01

Question#: 085  
Answer: C  
Reference:  
EOP-3 Rev 19  
NEW  
HIGHER  
K/A#: 295036 2.4.4

Question#: 086  
Answer: C  
Reference:  
EOP-2 Rev 14  
NEW  
HIGHER  
K/A#: 206000A2.07

Question#: 087  
Answer: D  
Reference:  
LCO 3.3.1.1 Amendment 243  
NEW  
HIGHER  
K/A#: 215003A2.03

Question#: 088  
Answer: B  
Reference:  
EOP-1 Rev 14 AOP-301.1 Rev 36  
NEW  
HIGHER  
K/A#: 217000 2.4.4

Question#: 089  
Answer: C  
Reference:  
TS 3.3.5.1 Amendment 245  
ARP 1C03A B-6 and B-7 Rev 44  
NEW  
HIGHER  
K/A#: 218000 2.1.33

Question#: 090  
Answer: A  
Reference:  
AOP-644, Rev 3  
EOP-1, Rev 14, ARP 1C05A (C-1) Rev 59  
NEW  
HIGHER  
K/A#: 261000A2.10

Question#: 091  
Answer: C  
Reference:  
ARP 1C06B D-3, Rev 42  
ARP 1C04B D-9, Rev 65  
NEW  
HIGHER  
K/A#: 204000A2.01

Question#: 092  
Answer: b.  
Reference:  
AOP-262 Rev 0  
Provide EHC Logic Diagram (attached)  
NEW  
HIGHER  
K/A#: 241000A2.16

Question#: 093  
Answer: D  
Reference:  
ARP 1C83B A-2 Rev 33  
Provide Generator Capability Curve  
NEW  
HIGHER  
K/A#: 245000 2.4.45

Question#: 094  
Answer: C  
Reference:  
ATWS RPV Control, Rev 16  
ATWS EOP Bases, Rev 11  
BANK  
HIGHER  
K/A#: 2.1.7

Question#: 095  
Answer: C  
Reference:  
Safety Limit 2.1.1.3 Amendment 243  
BANK  
FUNDAMENTAL  
K/A#: 2.1.10

Question#: 096  
Answer: D  
Reference:  
Tech Spec L3.6.4.2 and B3.6.4.2 Amendment  
237  
NEW  
FUNDAMENTAL  
K/A#: 2.2.21

Question#: 097  
Answer: A  
Reference:  
SEP 301.1 Rev 6  
BANK  
FUNDAMENTAL  
K/A#: 2.3.8

Question#: 098  
Answer: B  
Reference:  
HPP 3102.03, Rev 16  
NEW  
FUNDAMENTAL  
K/A#: 2.3.2

Question#: 099  
Answer: D  
Reference:  
ACP 1410.1 Rev 56 page 13  
BANK  
FUNDAMENTAL  
K/A#: 2.4.10

Question#: 100  
Answer: A  
Reference:  
AOP-913 Rev 49  
BANK  
FUNDAMENTAL  
K/A#: 2.4.2

\*\*\*\*\*END OF EXAMINATION\*\*\*\*\*

## ANSWER KEY

## MULTIPLE CHOICE

001	a.	021	c.	041	a.	061	d.	081	b.
002	d.	022	c.	042	c.	062	c.	082	a.
003	d.	023	b.	043	a.	063	d.	083	c.
004	c.	024	a.	044	c.	064	a.	084	b.
005	b.	025	b.	045	a.	065	d.	085	c.
006	a.	026	b.	046	c.	066	d.	086	c.
007	a.	027	d.	047	a.	067	d.	087	d.
008	d.	028	c.	048	b.	068	b.	088	b.
009	a.	029	d.	049	c.	069	b.	089	c.
010	b.	030	b.	050	a.	070	b.	090	a.
011	b.	031	b.	051	b.	071	d.	091	c.
012	d.	032	d.	052	b.	072	c.	092	b.
013	d.	033	d.	053	c.	073	c.	093	d.
014	d.	034	b.	054	d.	074	a.	094	c.
015	c.	035	a.	055	b.	075	c.	095	c.
016	b.	036	c.	056	a.	076	b.	096	d.
017	d.	037	d.	057	a.	077	b.	097	a.
018	a.	038	d.	058	c.	078	a.	098	b.
019	a.	039	b.	059	a.	079	b.	099	d.
020	d.	040	c.	060	c.	080	d.	100	a.