

# U.S. Nuclear Regulatory Commission

## 15-01 BFN RO Written Examination

### Applicant Information

Name:

Date:

Facility/Unit: BFN / U1- U2 – U3

Region:

I ☐ II ☒ III ☐ IV ☐

Reactor Type: W ☐ CE ☐ BW ☐ GE ☒

Start Time:

Finish Time:

### Instructions

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

### Applicant Certification

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

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

### Results

Examination Value 75 Points

Applicant's Score \_\_\_\_\_ Points

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

Rec'd  
9/29/14

## QUESTION 1 Rev 6

Unit 1 is at 100% Reactor Power when Reactor Recirc Pump 1A tripped. The crew enters 1-AOI-68-1A Recirc Pump Trip/Core Flow Decrease OPRMs Operable.

- Core Flow Input into the APRMs is 50%.
- Tech Spec actions for single loop operation have **not** been completed.

Reactor power starts to rise and continues until the Reactor Scrams.

At what indicated power level on the APRMs did the Reactor **FIRST** Scram?

- A. 119%
- B. 98%
- C. 94%
- D. 92%

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295001 AA2.02	
	Importance Rating	3.1	
Ability to determine and/or interpret the following as they apply to Partial Or Complete Loss Of Forced Core Flow Circulation: AA2.02 Neutron Monitoring			
<p>Explanation: <b>CORRECT B</b> - When the Recirculation pump trips, core flow inputs into the APRMs lowers to 50% so using the RPS APRM scram setpoint value for two loop operation <math>(0.66W+65\%) = 0.66(50) + 65 = 98\%</math></p> <p>A. Incorrect – This is the fixed APRM scram and a scram signal will be generated for this setpoint, but it is not the first one, the 98% flow bias scram is the first one.</p> <p>C. Incorrect – This is the Rod block allowable value from the COLR for Unit 1 <math>(0.66W+61\%) = 0.66(50) + 61\% = 94\%</math></p> <p>D. Incorrect – This is the Rod Block nominal setpoint from the COLR for Unit 1 <math>(0.66W+59\%) = 0.66(50) + 59\% = 92\%</math></p>			
Technical Reference(s): 1-AOI-68-1A; 1-OI-92B, COLR.			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.148 Objective V.B.15.c. OPL171.007A V.B.1			
Question Source:		Bank: Modified Bank: BFN 1102 New:	
Question History:		Previous NRC: NA	
Question Cognitive Level:		Memory or Fundamental Knowledge Comprehension or Analysis X	
10 CFR Part 55 Content: 41 (b)(6)			

ILT 1102 Written Exam 76. 295001 AA2.02

Unit 1 was at 100% Reactor Power when Reactor Recirc Pump 1A tripped. Total Core Flow indication lowered to 50%.

Which ONE of the following completes the statements below? Following the trip, APRM Flow Biased Scram set point will be (1) Simulated Thermal Power.

The APRM Flow Biased Simulated Thermal Power – HIGH setpoint is required to be adjusted to Single Loop allowable value within a MAXIMUM of (2) in accordance with T.S. 3.4.1, "Recirculation Loops Operating."

- A. (1) 92%  
(2) 12 hours
- B. (1) 92%  
(2) 24 hours
- C. (1) 98%  
(2) 12 hours
- D. (1) 98%  
(2) 24 hours

## QUESTION 2 Rev 1

Unit 1 and 2 are operating in MODE 1 with the following conditions:

- 4 KV Shutdown Boards A through D are in the normal system alignment.
- 4 KV Shutdown Bus 2 is being supplied from 4 KV Unit Board 1B through 4 KV SD BUS 2 ALT FDR BKR 1712.
- 4 KV Shutdown Bus 2 NORM SUPPLY BKR 1226 is tagged out of service

**Subsequently**, Alternate Feeder Breaker 1712 trips open.

Which ONE of the following is the expected response of the Unit 1/2 Diesel Generators?

- A. ONLY the A and B Diesel Generators are supplying their Shut Down boards.
- B. All four Diesel Generators are supplying their Shut Down boards.
- C. ONLY C and D Diesel Generators are supplying their Shut Down boards.
- D. None of the Diesel Generators are supplying their Shut Down boards.

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295003 AA1.02	
	Importance Rating	4.2	
295003 AA1.02 - Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of AC Power: Emergency Generators			
<p>Explanation: <b>Answer C:</b> 4 KV SD Boards C and D Normal Feeder breakers are feed by 4 KV SD Bus 2. When the alternate feeder for 4 KV SD Bus 2 Trips it will be de-energized. Since the <u>4KV SD Board 43 switches are in manual</u> C and D DGs start and tie to their respective SD Boards.</p> <p>A – Incorrect – Plausible in that if 4 KV SD Bus 1 were to de-energize this would be correct or if the A and B 4 KV SD Boards were being fed from their alternate supply breakers this would be correct.</p> <p>B – Incorrect – Plausible in that almost all <u>loss of power scenarios</u> involve all four DG starting. This would be correct if the A and B SD Boards were fed from their alternate feed and C and D were on their normal feed.</p> <p>D – Incorrect – Plausible this would be correct if the <u>SD Board 43 switches</u> were in auto.</p>			
Technical Reference(s): PIP-02-03 Rev 03/23/2013, 0-OI-57A Rev 150 illustration 1 and Simulator			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.038 Rev 20 ILT 4 and 5			
Question Source:	Bank: Modified Bank: New        X		
Question History:	Previous NRC: NONE		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis: X		
10 CFR Part 55 Content: (b)(7)			

### QUESTION 3    Rev 3

Unit 3 is in MODE 3 when the following events occur:

09:00 RHR Pump 3B is placed in service, for Shutdown Cooling

09:02 Battery Board 3 de-energized due to a fault

09:04 RHR Pump 3B experiences an over-current condition.

**(Assume No Operator Actions have been taken.)**

What is the current status of RHR Pump 3B?

- A. It tripped on over-current.
- B. It remains running and cannot trip on over-current.
- C. It remains running and can be tripped from the 3EC 4kv SD board control switch.
- D. It tripped but can be manually restarted from the 3EC 4KV SD board control switch.

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295004 AK1.05	
	Importance Rating	3.3	
Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of DC Power: Loss of Breaker Protection .			
<p>Explanation: <b>Answer B:</b> With a complete loss of 250V DC Battery Board 3 Breaker Control power for 4160V SD Board 3EC loads is lost. This loss includes breaker protection such as overcurrent, and all the loads on that Board can only be tripped manually at the breaker. The 3B RHR Pump is supplied power from the 3EC 4160V SD Board.</p> <p>A – Incorrect – Plausible in that if the Battery Board 3 Breaker supplied control power to the opposite 4160V SD Board the 3B pump would be allowed to trip on overcurrent.</p> <p>C – Incorrect – Plausible in that there are fuses for normal and emergency control power at the breaker. Control power for the pump is lost when the 250V DC Battery Board 3 de-energizes unless the control power is manually transferred to alternate.</p> <p>D – Incorrect – Plausible in that there are fuses for normal and emergency control power at the breaker. Control power for the pump is lost when the 250V DC Battery Board 3 de-energizes unless the control power is manually transferred to alternate.</p>			
Technical Reference(s): OPL171.036 Rev 13, 0-OI-57D Rev 139			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.037 ILT 11			
Question Source:		Bank:	
		Modified Bank:	
		New      X	
Question History:		Previous NRC: NONE	
Question Cognitive Level:		Memory or Fundamental Knowledge:	
		Comprehension or Analysis: X	
10 CFR Part 55 Content: 41 (b)(7)			



#### QUESTION 4 Rev 2

Unit 1 is operating at 100% power when a Turbine Control Valve Fast Closure Trip occurs.

What is the Emergency Trip System (ETS) trip setpoint and what does it protect?

- A. 550 psig to ensure that the Reactor Core - MCPR Safety Limit is **not** exceeded
- B. 550 psig to ensure that the Reactor Coolant System Pressure Safety Limit is **not** exceeded
- C. 850 psig to ensure that the Reactor Core - MCPR Safety Limit is **not** exceeded
- D. 850 psig to ensure that the Reactor Coolant System Pressure Safety Limit is **not** exceeded

Answer: C

Main Turbine Trip

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295005 G2.4.21	
	Importance Rating	4.0	
Main Turbine Generator Trip: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.			
Explanation: <b>CORRECT</b> C: Setpoint in plant is 850 psig and MCPR is the safety limit protected.			
A – First part Incorrect but plausible as this is the number in Tech Spec Bases and it is also listed in the ARP. Second part Correct.			
B – First part Incorrect but plausible as this is the number in Tech Spec Bases and it is also listed in the ARP. The second part Incorrect but plausible in that an isolation of the TCV will result in a pressure transient as mentioned in the Bases for an MSIV closure, but the reactor coolant system pressure protection is provided by the APRM RPS function.			
D – First part Correct. The second part Incorrect but plausible in that an isolation of the TCV will result in a pressure transient as mentioned in the Bases for an MSIV closure, but the reactor coolant system pressure protection is provided by the APRM RPS function.			
Technical Reference(s): 1-OI-99 Rev 45, 1-ARP-9-4A Rev 21, TS Bases 3.3.1.1 Amendment 266			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.028 ILT 9 and 12			
Question Source:	Bank: BFN 0801 NRC #4 Modified Bank: New		
Question History:	Previous NRC: BFN 0801 NRC #4		
Question Cognitive Level:	Memory or Fundamental Knowledge X Comprehension or Analysis		
10 CFR Part 55 Content: 41 (b)(6)			

BFN NRC 0801 #4

Which ONE of the following completes the statement?

The **ACTUAL** trip setpoint for the “RPS Turbine Control Valve Fast Closure Trip – Low Oil Pressure” on Unit 3 is set at \_\_**(1)**\_\_; **AND** this ensures that the \_\_**(2)**\_\_ Safety Limit is **NOT** exceeded.

- A. **(1)** 550 psig;  
**(2)** Reactor Core - MCPR
- B. **(1)** 550 psig;  
**(2)** Reactor Coolant System Pressure
- C. **(1)** 850 psig;  
**(2)** Reactor Core - MCPR
- D. **(1)** 850 psig;  
**(2)** Reactor Coolant System Pressure

43. Given the following plant conditions:

- Unit 1 is at 100% rated power when the Desk Unit Operator notices that number 3 Main Turbine Stop Valve (MTSV) position indication is reading 50%.
- Numbers 1, 2, and 4 MTSV position indications all read 100%.
- Maintenance investigation determines that the cause of the MTSV position indicator failure is due to a mechanical failure of the Linear Variable Differential Transformer (LVDT).
- The Unit 1 Main Turbine later receives a trip signal.

Which ONE of the following describes the effect on Main Turbine/Generator operation?

- A. The RPS logic contact for the #3 MTSV will NOT function so a turbine trip will NOT initiate a scram.
- B. The RPS logic contact is already OPEN for the #3 MTSV so a turbine trip will initiate a scram.
- C. The Generator output breaker will NOT automatically open on a turbine trip.
- D. The Generator output breaker will automatically open on a turbine trip.

44. Given the following plant conditions:

- Power ascension is in progress on Unit 3 with the Main Turbine on line.
- Control Rods are being withdrawn to increase power.
- As reactor power approaches 35%, the Shift Technical Advisor (STA) notes that two (2) Turbine Bypass Valves are OPEN.

Which ONE of the following describes the effect on the plant?

Regarding the UFSAR Chapter 14 analyses for a turbine trip, the above condition is

\_\_\_\_\_ (1) \_\_\_\_\_ conservative than the assumptions used in the UFSAR because  
\_\_\_\_\_ (2) \_\_\_\_\_.

(1)

(2)

- A. more; it lowers the peak vessel pressure for a design basis transient in regard to peak cladding temperature.
- B. less; it raises the actual power level at which the RPS reactor scram on turbine trip is enabled.
- C. more; it lowers the peak vessel pressure for a design basis transient in regard to transition boiling.
- D. less; it raises the actual power level for a design basis transient in regard to peak cladding temperature.

### QUESTION 5 Rev 2

Following a Reactor SCRAM which ONE of the following reports from the Reactor Operator, allows the Unit Supervisor to exit RC/Q and enter 1-AOI-100-1, Reactor Scram?

- A. The SRMs and IRMs are being inserted and 4 Control Rods are at position 24.
- B. The SRMs and IRMs are fully inserted. The IRMs are on range 4 and not all Control Rods in, injecting boron.
- C. The SRMs and IRMs are fully inserted. Reactor power is on range 5 of the IRMs and SRM period indicates positive.
- D. The SRMs and IRMs are fully inserted. Reactor power is on range 6 of the IRMs and SRM period indicates negative.

Answer: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295006 AK2.06	
	Importance Rating	4.2	
Knowledge of the interrelations between SCRAM and the following: Reactor Power			
<p>Explanation: CORRECT D: With power on IRM range 6 this is below the heating range and with period indication negative this indicates that reactor power is lowering.</p> <p>A – Incorrect – plausible this may meet the requirements of power less than the heating range and lowering but this report alone is NOT enough to exit RC/Q to AOI-100-1</p> <p>B – Incorrect – plausible in that it meets power less than the heating range and not trending upwards but once SLC is injected must have all control rods inserted in accordance with the NOTE</p> <p>C – incorrect – plausible in that power is well below the heating range on IRM range 5 but with period indication positive power is rising thus RC/Q cannot be exited.</p>			
Technical Reference(s): EOIPM 0-I-C Rev 1, 0-III-C Rev 3 and 0-V-C Rev 2			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.201 ILT 15			
Question Source:		Bank:	
		Modified Bank:	
		New : X	
Question History:		Previous NRC: NO	
Question Cognitive Level:		Memory or Fundamental Knowledge X	
		Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(10)	

## QUESTION 6 Rev 2

All control rooms have been abandoned and are operating in accordance with AOI-100-2, Control Room Abandonment.

**Subsequently**, the following alarms are received on Panel 25-32:

- EECW FLOW LOW
- SUPPR CHAMBER WATER LEVEL ABNORMAL

The Operator at Panel 25-32 notes the following indications associated with the alarms received:

- Both EECW North and South Header flow readings are 0 gpm.
- Supp Chamber water level indicates (-) 12 inches and slowly lowering.

Which annunciator response should take precedence over the other and why?

- A. EECW FLOW LOW; The RHR Room Coolers will not be able to support running the RHR Pump for extended periods of time.
- B. EECW FLOW LOW; The Diesels are running without cooling water and a pump must be started to supply cooling to the Diesels.
- C. SUPPR CHAMBER WATER LEVEL ABNORMAL; RPV Emergency Depressurization is required when Pressure Suppression Pressure is exceeded.
- D. SUPPR CHAMBER WATER LEVEL ABNORMAL; Vortex Level restrictions to the RHR pumps will prevent the running of RHR in Torus Cooling.

Answer: B



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295016 G2.4.45	
	Importance Rating	4.1	
295016 Control Room Abandonment. G2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.			
<p>Explanation: <b>CORRECT B:</b> With low flow on the North EECW Header, the diesels that are started when the operators leave the control room will be running without cooling water. Diesel Generator operation without EECW cooling water will cause DG failure. EECW FLOW LOW Alarm is more important than the Suppression Pool Level alarm at (-) 12 inches.</p> <p>A – Incorrect – EECW FLOW LOW is correct however the cooling for the Diesels is the reason for prioritizing it over Torus Water Level. Cooling for the RHR Rooms is a concern however restoring cooling to the RHR rooms is not as time critical.</p> <p>C – Incorrect – SUPPR CHAMBER WATER LEVEL ABNORMAL; If torus level continues to lower an Emergency Depressurization would be required when PSP curve is exceeded however with suppression pool level at (-)12 inches and lowering slowly restoring cooling to the Diesels is more time critical.</p> <p>D – Incorrect – SUPPR CHAMBER WATER LEVEL ABNORMAL; Vortex Limit of 10 feet in the Torus will prevent the running of RHR in Torus Cooling. In AOI-100-2 Torus cooling provides the heat sink for cool down and removal of decay heat however, restoring cooling to the Diesels is more time critical.</p>			
Technical Reference(s): AOI-100-2 Rev 22, 57, 21; 0-OI-82 Rev 151; 0-AOI-57-1A Rev 150			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.208 ILT 6			
Question Source:	Bank: Modified Bank: New X		
Question History:	Previous NRC: NONE		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis X		
10 CFR Part 55 Content:	55.41 (b)(7)		

## QUESTION 7

Unit 3 is operating at 100% with the Spare RBCCW pump disassembled for maintenance. When the following occurs:

- One Unit 3 RBCCW pump trips and cannot be restarted
- 3-FCV-070-48, RBCCW Sectionalizing Valve closes

Which ONE of the following completes the statements below?

An **IMMEDIATE** U3 manual reactor scram \_\_\_ (1) \_\_\_ in accordance with 3-AOI-70-1, Loss of Reactor Building Closed Cooling Water.

With the RBCCW Sectionalizing valve closed the \_\_\_ (2) \_\_\_ will be adversely affected.

- A. (1) is not required  
(2) RWCU Continuous Conductivity Monitoring
- B. (1) is not required  
(2) Drywell Equipment Drain Sump
- ☒ C. (1) is required  
(2) RWCU Continuous Conductivity Monitoring
- D. (1) is required  
(2) Drywell Equipment Drain Sump

Answer: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295018 AK1.01	
	Importance Rating	3.5	
295018 AK1.01 Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of Component Cooling Water: Effects on components/system operations			
<p>Explanation: <b>CORRECT A:</b> Reactor SCRAM NOT required one RBCCW pump remains in service total RBCCW flow is not lost. When the sectionalizing valve closes RWCU will trip or will be tripped this will cause a loss of continuous conductivity monitoring of the reactor coolant.</p> <p>B – Incorrect – First part Correct. Second part Incorrect plausible in that the Reactor bldg equipment drain sump is on the non-essential loop but the Drywell Equipment Drain sump cooling is on the essential loop.</p> <p>C – Incorrect – First part Incorrect plausible in that a complete loss of RBCCW will require a SCRAM and if the temperature continues to rise a SCRAM may be <u>eventually</u> required. Second part Correct.</p> <p>D – Incorrect – First part Incorrect see C above and second part Incorrect see B above</p>			
Technical Reference(s): OI-64 Rev 58, TRM 3.4.1 Rev 21, ARP-9-4C Rev 33, AOI-70-1 Rev 17			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.047 V.B.2 and 7			
Question Source:	Bank:		
	Modified Bank:	BFN 1205 NRC #7	
	New		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis: X		
10 CFR Part 55 Content:	55.41 (b)(10)		

**BFN NRC 1205**

**QUESTION 7**

Unit 3 is operating at 100% with the Unit 1 Spare RBCCW pump disassembled for maintenance.

One Unit 3 RBCCW pump trips and cannot be restarted.

Which ONE of the following completes the statements below?

The 3-FCV-070-48, RBCCW Sectionalizing Valve, will auto-close when the \_\_ (1) \_\_.

An **IMMEDIATE** manual reactor scram \_\_ (2) \_\_ in accordance with 3-AOI-70-1, Loss of RBCCW.

- A. (1) discharge header pressure lowers below 50 psig  
(2) is required
- B. (1) suction header temperature rises above 100°F  
(2) is required.
- C. (1) discharge header pressure lowers below 50 psig  
(2) is NOT required
- D. (1) suction header temperature rises above 100°F  
(2) is NOT required

**Question 8    Rev 2**

Units 1, 2, and 3 are operating at 100% power with Control Air in the following configuration:

- G Control Air Compressor is running and loaded
- A and B Control Air Compressors are in LEAD
- C and D Control Air Compressors are in LAG

Subsequently, Control Air header pressure is lowering due to an air leak.

Which ONE of the following completes the statement below?

The LAG compressors will start based on \_\_\_\_\_ to attempt to restore air pressure.

- A. a time delay
- B. the offset pressure set point
- C. the online pressure set point
- D. manually depressing the start key

Answer B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295019 AK3.02	
	Importance Rating	3.5	
295019 AK3.02 Knowledge of the (reasons) for the following responses as they apply to Partial or Complete Loss of Instrument Air: Standby air compressor operation			
<p>Explanation: <b>Answer B: CORRECT</b>- With the G compressor running, the A and B compressors will start at the ONLINE pressure setpoint of 98 psig. The C and D compressors have a Lag Offset pressure setpoint of either 2 or 4 psig from the LEAD online pressure setpoint.</p> <p>A - Incorrect – plausible that there is a time delay to limit board starting current as other plant equipment (Fire Pumps etc..) start on a time delay.</p> <p>C – Incorrect – plausible because the Lead compressors start at the ONLINE pressure setpoint.</p> <p>D – Incorrect –plausible in that this is how the E service air compressor is started.</p>			
Technical Reference(s): 0-OI-32 Rev 134, 0-OI-33 Rev 80			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.054 V.B.8			
Question Source:		Bank: Modified Bank: New <input checked="" type="checkbox"/>	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: <input checked="" type="checkbox"/> Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(4)	

### **QUESTION 9 Rev 2**

Unit 2 is shutdown and in MODE 4 when a loss of Shutdown Cooling occurs at 00:00 on June 1.

- Coolant temperature is 124° F.
- It has been 16 days since the plant was shut down.
- Shutdown Cooling flow can NOT be established.

Based on Illustration 1, what time would you expect a mode change?

**Illustration 1 attached**

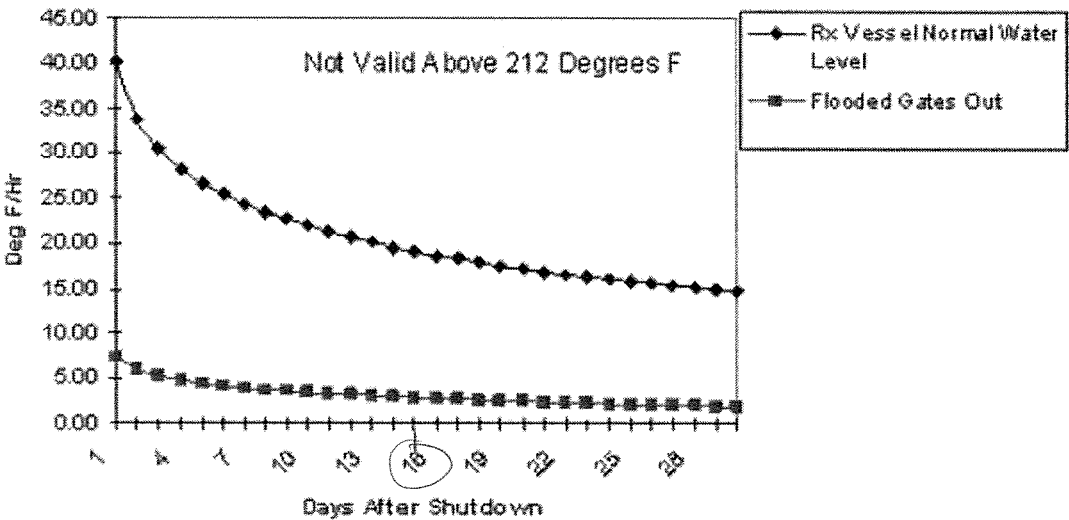
- A. 03:48 on June 1
- B. 04:24 on June 1
- C. 06:24 on June 2
- D. 11:12 on June 2

Answer: B

BFN Unit 2	Loss of Shutdown Cooling	2-AOI-74-1 Rev. 0039 Page 24 of 29
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Illustration 1  
(Page 1 of 1)

U2 Heatup Rate with Loss of Cooling



Graph represents Conservative Values for any Cycle

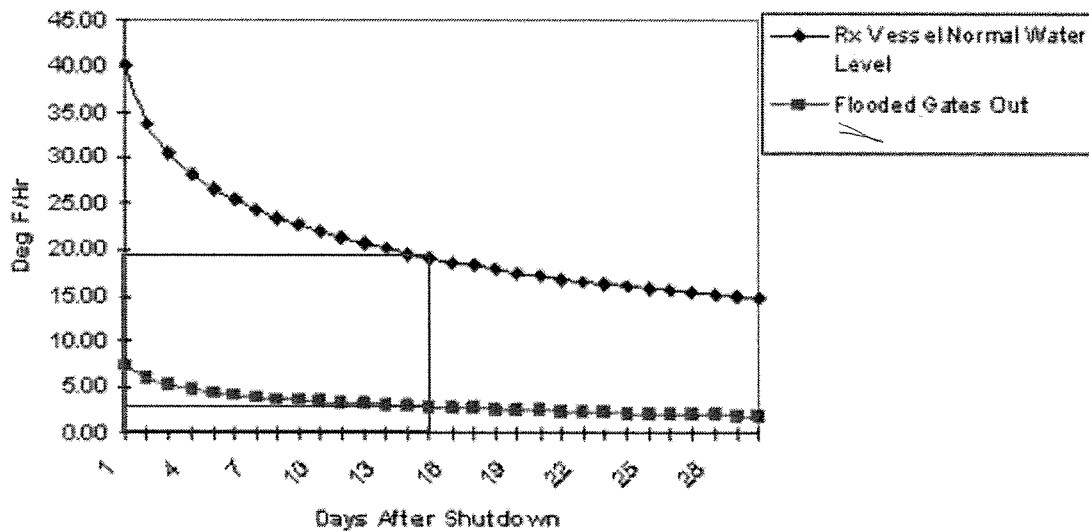


<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295021 AK1.01	
	Importance Rating	3.6	
295021 Loss of Shutdown Cooling AK1.01 Knowledge of the operational implications of the following concepts as they apply to Loss of Shutdown Cooling: Decay heat			
<p>Explanation: <b>CORRECT B:</b> Since the time from shutdown is 16 days the candidate will plot that using Illustration 1 provided. With water level in the normal range for Shutdown Cooling the upper curve should be used and the heatup rate for 16 days post shutdown is 20° F/hours. With a start temperature of 124° F at 00:00 on June 1, subtracting that from 212° F results in an 88° F delta until the mode change will occur. 88° F/20° F is 4.4 hours which is 4 hour and 24 minutes. 00:00 + 4:24 = 04:24 on June 1.</p> <p>A. Incorrect – this is the time to 200° F as addressed in the loss of Fuel Pool Cooling Abnormal Procedure. The delta temperature would be 76° F. Divide that by 20 and you get 3.8 hours, 00:00 +3:48 = 03:48 on June 1.</p> <p>C. Incorrect – this is the time to 200° F as addressed in the loss of Fuel Pool Cooling Abnormal Procedure. The delta temperature would be 76° F. Divide that by 2.5 and you get 30.4 hours, 00:00 +30.4 = 6.4 hours + one day resulting in the mode change time of 06:24 on June 2.</p> <p>D. Incorrect – this is the time to 212° F. The delta temperature would be 88° F. Divide that by 2.5 and you get 35.2 hours, 00:00 +35.2 = 11:12 hours + one day resulting in the mode change time of 11:12 on June 2.</p>			
Technical Reference(s): 2-AOI-74-1 Rev 39, 0-OI-72 Rev 57			
Proposed references to be provided to applicants during examination: 2-AOI-74-1 Illustration 1			
Learning Objective (As available): OPL171.044 ILT 12 and 13			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41 (b)(10)	

BFN Unit 2	Loss of Shutdown Cooling	2-AOI-74-1 Rev. 0039 Page 24 of 29
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Illustration 1  
(Page 1 of 1)

U2 Heatup Rate with Loss of Cooling



Graph represents Conservative Values for any Cycle

Table 1.1-1 (page 1 of 1)  
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel(a) or Startup/Hot Standby	NA
3	Hot Shutdown(a)	Shutdown	> 212
4	Cold Shutdown(a)	Shutdown	≤ 212

**QUESTION 10    Rev 6**

Unit 1 is in a Refueling Outage. The Refueling SRO reports that an **IRRADIATED** fuel assembly has been seated in the **WRONG** location in the core. The grapple remains engaged on the bundle.

The following conditions are then noted:

- Rising count rates on SRMs
- SRM Period lights illuminated
- Rising dose rates on the Refuel Floor

Which ONE of the following describes an **IMMEDIATE** Operator action in accordance with Refueling AOIs?

- A. Verify Secondary Containment is intact.
- B. If SLC is operable place SLC PUMP 1A/1B, 1-HS-63-6A control switch in START A **OR** START B.
- C. If any CRD Pump is in service stop the CRD Pump.
- D. Raise the fuel bundle from the core location.

Answer: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295023 AK1.03	
	Importance Rating	3.3	
295023 Refueling Accidents AK1.03 Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS: Inadvertent criticality ✓			
<p>Explanation <b>CORRECT D:</b> In order to answer this question correctly the candidate must determine the appropriate condition and Immediate Action required by 1-AOI-79-2.</p> <p>A. Incorrect - This is plausible because it is a required <u>subsequent action</u> of 1-AOI-79-1, "Fuel Damage During Refueling."</p> <p>B. Incorrect - This is plausible because it is a required <u>subsequent action</u> of 1-AOI-79-2, not immediate action.</p> <p>C. Incorrect - This is plausible because it is a required <u>subsequent action</u> of 1-AOI-79-2, not immediate action.</p>			
Technical Reference(s): 1-AOI-79-2 Rev. 1			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.060 V.B.3			
Question Source:		Bank: BFN 1102 # 10 Modified Bank: New	
Question History:		Previous NRC: BFN 1102 # 10	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis    X	
10 CFR Part 55 Content:		55.41 (b)(10)	

### QUESTION 11 Rev 2

Unit 1 is operating at 100% power when a LOCA occurs resulting in the following:

- Drywell Pressure 3 psig
- Reactor Pressure is 300 psig
- 4 KV Shutdown Board C is locked out.

The Unit Supervisor has directed the Unit Operator to use Core Spray to restore Reactor Water level using EOI appendix 6D Injection Subsystem Lineup Core Spray System I and 6E Injection Subsystem Lineup Core Spray System II.

Which of the following indicates the Core Spray pumps that have auto started?

- A. 1A, 1B, and 1D only
- B. 1A and 1C only
- C. 1B and 1D only
- D. 1A, 1C and 1D only

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295024 EK2.03	
	Importance Rating	3.8	
Knowledge of the interrelations between High Drywell Pressure and the following: LPCS: plant-specific			
<p>Explanation: <b>CORRECT B:</b> Core Spray pumps 1A and 1C will auto start on a high drywell pressure and low reactor pressure, but since 4 KV Shutdown Board C is de-energized the 1B Core Spray Pump has no power to start and its companion the 1D Core Spray pump will not auto start but could be manually started.</p> <p>A – Incorrect – Plausible if Core Spray Pump 1C is powered from 4 KV Shutdown Board C.</p> <p>C – Incorrect - Plausible if Core Spray Pump 1C is powered from 4 KV Shutdown Board C and a Core Spray pump will not auto start if the companion pump does not have power.</p> <p>D – Incorrect - Plausible if the Core Spray pump will not auto start if the companion pump does not have power.</p>			
Technical Reference(s): 1-OI-75 Rev 28			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.045 V.B.5			
Question Source:		Bank:	
		Modified Bank:	
		New        X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge	
		Comprehension or Analysis    X	
10 CFR Part 55 Content:		55.41 (b)(7)	

### QUESTION 12 Rev. 1

Unit 1 was operating at 100% power when a main turbine trip occurred, an ATWS currently exists.

The following annunciators alarmed after the turbine tripped:

- REACTOR PRESS HIGH (1-9-5A, window 1)
- MAIN STEAM RELIEF VALVE OPEN (1-9-3C, window 25)

The Unit Operator observes MSRVS are cycling.

Which ONE of the following completes the following statement in accordance with 1-EOI-1,RPV Control RC/P leg?

Manually open \_\_\_\_ (1) \_\_\_\_ . The basis for this step is to \_\_\_\_ (2) \_\_\_\_ .

- A. (1) main turbine bypass valves to lower reactor pressure until no MSRVS are cycling  
(2) minimize dynamic loads on MSRVS tail pipes and support structures
- B. (1) main turbine bypass valves to lower reactor pressure until no MSRVS are cycling  
(2) maximize heat rejection to the main condenser
- C. (1) MSRVS until RPV pressure drops to the pressure at which all main turbine bypass valves are fully open  
(2) minimize dynamic loads on MSRVS tail pipes and support structures
- D. (1) MSRVS until RPV pressure drops to the pressure at which all main turbine bypass valves are fully open  
(2) maximize heat rejection to the main condenser

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295025 G2.2.44	
	Importance Rating	4.2	
295025 High Reactor Pressure: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.			
<p>Explanation: <b>Answer D:</b> With MSRVs cycling, it is appropriate to take manual control and open MSRVs to decrease RPV pressure to the RPV pressure at which all main turbine bypass valves are full open</p> <p>A – Incorrect – First part Incorrect see C above and second part Incorrect see B above.</p> <p>B – Incorrect – First part Incorrect plausible because the MSRVs are the decision step in the EOI and opening the TBVs would drop pressure to the point at which the MSRVs would close. Second part Correct.</p> <p>C – Incorrect – First part Correct. See A above. Second part Incorrect plausible because this is one of reasons for reducing the cycling of the MSRVs.</p>			
Technical Reference(s): 1-EOI-1 Rev 3,			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.202 Rev 8, L.O. V.B.5			
Question Source:		Bank: Modified Bank: BFN NRC 1108 #12 New	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge Comprehension or Analysis    X	
10 CFR Part 55 Content:		55.41 (b)(10)	



## BFN NRC 1108 #12

Unit 1 was operating at 100% power when a main turbine trip occurred, an ATWS exists. The following annunciators alarmed after the turbine tripped:

- REACTOR PRESS HIGH (1-9-5A, Window 1)
- MAIN STEAM RELIEF VALVE OPEN (1-9-3C, Window 25)

The Unit Operator observes that two MSRVs are cycling.

Which ONE of the following completes the following statement in accordance with 1-EOI-1,RPV Control RC/P leg?

Manually open \_\_ (1) \_\_ using \_\_ (2) \_\_ .

- A. (1) The Turbine bypass valves to lower reactor pressure until no MSRVs are cycling  
(2) 1-EOI Appendix-11H, Alternate RPV Pressure Control systems Main Condenser.
- B. (1) MSRVs until RPV pressure drops to the pressure at which all Turbine bypass valves are fully open  
(2) 1-EOI Appendix-11A, Alternate RPV Pressure Control systems MSRVs
- C. (1) The Turbine bypass valves to lower reactor pressure until no MSRVs are cycling  
(2) 1-EOI Appendix-11A, Alternate RPV Pressure Control systems MSRVs
- D. (1) MSRVs until RPV pressure drops to the pressure at which all Turbine bypass valves are fully open  
(2) 1-EOI Appendix-11H, Alternate RPV Pressure Control systems Main Condenser.

ANSWER B

**QUESTION 13    Rev 2**

What is BFN's Boron Injection Initiation Temperature (BIIT)?

AND

What is the reason for that temperature?

A. 110 °F

If boron injection is initiated before suppression pool temperature reaches the BIIT, emergency RPV depressurization may be precluded.

B. 110 °F

If boron injection is initiated before suppression pool temperature reaches the BIIT, long term core cooling can be assured.

C. 120 °F

If boron injection is initiated before suppression pool temperature reaches the BIIT, emergency RPV depressurization may be precluded.

D. 120 °F

If boron injection is initiated before suppression pool temperature reaches the BIIT, long term core cooling can be assured.

Answer: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295026 EK3.04	
	Importance Rating	3.7	
K&A: Knowledge of the reasons for the following responses as they apply to Suppression Pool High Water Temperature: SBLC Injection			
<p>Explanation: <b>Answer A:</b> 110 is the BIIT Temperature. and <u>SCRAM required by Tech Specs</u>. See EOIPM Section 0-II-ZB for discussion of the BIIT. The second part is that if SLC is injected prior to BIIT then emergency RPV depressurization may be precluded.</p> <p>B – Incorrect – First part Correct. Second part Incorrect plausible in that this is the bases for ECCS pumps being able to provide long term core cooling if torus water temperature is maintained sufficiently low (not affecting NPSH).</p> <p>C – Incorrect – First part Incorrect plausible in that 120°F is the tech spec temperature that requires a depressurization of the reactor to less than 200 psig. Second part Correct</p> <p>D – Incorrect – First part Incorrect plausible in that 120°F is the tech spec temperature that requires a depressurization of the reactor to less than 200 psig. Second part Incorrect plausible in that this is the bases for ECCS pumps being able to provide long term core cooling if torus water temperature is maintained sufficiently low (not affecting NPSH).</p>			
Technical Reference(s): Tech Spec 3.6.2.1 Amendment 253, EOI Bases – EOIPM Section 0-V-C Rev 2			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.201 10			
Question Source:	Bank: Modified Bank: New            X		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge   X Comprehension or Analysis		
10 CFR Part 55 Content:	55.41(b)(10)		

### QUESTION 14 Rev 2

Which ONE of the following completes the statements below?

In the Drywell Temperature leg (DW/T) of EOI-2 before Drywell Temperature rises to \_\_ (1) \_\_  
EOI-1 is entered and the Reactor is scrammed.  
The bases for this scram is to prevent \_\_ (2) \_\_.

- A. (1) 160 °F  
(2) exceeding the environmental qualification of safety related equipment in the drywell
- B. (1) 160 °F  
(2) loss of pressure suppression function of primary containment
- C. (1) 200 °F  
(2) exceeding the environmental qualification of safety related equipment in the drywell
- D. (1) 200 °F  
(2) loss of pressure suppression function of primary containment

Answer: C

Hi DW Temp

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295028 EK3.05	
	Importance Rating	3.6	
295028 EK3.05 Knowledge of the reasons for the following responses as they apply to High Drywell Temperature: Reactor SCRAM			
<p>Explanation: <b>Answer C:</b> DW/T-4 states that before DW temp rises to 200°F continue DW/T-5 sends you to EOI-1 at step RC-1 this will ensure a scram is initiated if not already performed. One of the bases for this scram is to prevent exceeding the environmental qualification of safety related equipment in the drywell</p> <p>A – Incorrect – First part Incorrect plausible in that 160°F is the DW entry temperature of EOI-2 and actions are taken at 160 to attempt to control DW temp below 200. Second part Correct.</p> <p>B – Incorrect – First part Incorrect see A above. Second part Incorrect plausible because this is one of the reasons for the suppression pool temperature leg in EOI-2.</p> <p>D – Incorrect – First part Correct and second part Incorrect see B above.</p>			
Technical Reference(s): EOIPM 0-V-D Rev 1, EOI-2 Rev 4			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.203 ILT 4			
Question Source:		Bank: Modified Bank: New X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(10)	

**QUESTION 15   Rev 3**

Unit 1 was operating at 100% power.

- A leak has developed at the bottom of the Torus.
- No operator action has been taken.

As Suppression Pool water level lowers, what level would be the **FIRST** to result in equalizing the airspace pressure between the Suppression Chamber and Drywell and prevent reestablishing differential pressure?

- A. 14.64 feet
- B. 12.75 feet
- C. 11.50 feet
- D. 5.50 feet

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295030 EA2.04	
	Importance Rating	3.5	
295030 EA2.04 Ability to determine and/or interpret the following as they apply to Low Suppression Pool Water Level: Drywell/suppression chamber differential pressure: Mark I and II			
<p>Explanation: <b>Answer C:</b> A water level drop to 11.50 feet is at the opening of downcomers equalizing drywell and suppression chamber pressure.</p> <p>A – Incorrect – plausible in that a level drop to 14.64 feet puts pool level at the Tech Spec required level of -6.25 inches with drywell/suppression chamber DP control and -7.25 inches without DP control.</p> <p>B – Incorrect – plausible in that a level drop to 12.75 feet which is the level of the HPCI/RCIC exhaust line and the level at which HPCI may no longer be used in the EOIs.</p> <p>D – Incorrect - plausible in that a level drop to 5.5 feet which is the level of the SRV T-Quenchers.</p>			
Technical Reference(s): 0-TI-394, EOIPM 0-V-D Rev 1			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.202 Rev 8 ILT 8 & 10,			
Question Source:	Bank: Monticello 2010 NRC #15 Modified Bank: New		
Question History:	Previous NRC: Monticello 2010 NRC #15		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis      X		
10 CFR Part 55 Content:	55.41 (b)(8)		

## QUESTION 16

Unit 2 is operating at 100% power when a Group 1 isolation occurs resulting in the following sequence of events concerning RCIC and Reactor Water Level:

- RCIC starts and injects along with HPCI and feeds the vessel up to Level 8 ( (+) 51 inches)
- Reactor Water Level begins to lower
- Reactor Water Level is (-) 20 inches

What is/are the **MINIMUM** action(s) required to inject with RCIC?

- A. Reopen the Steam Supply Valve (FCV-71-8) only.
- B. Depress the RCIC Turbine Trip Reset Pushbutton only.
- C. Depress the RCIC Turbine Trip Reset Pushbutton and reopen the RCIC Turbine Trip and Throttle Valve (2-FCV-71-9).
- D. Depress the RCIC High Reactor Water Level Trip Reset Pushbutton and reopen the Steam Supply Valve (FCV-71-8).

Answer: A



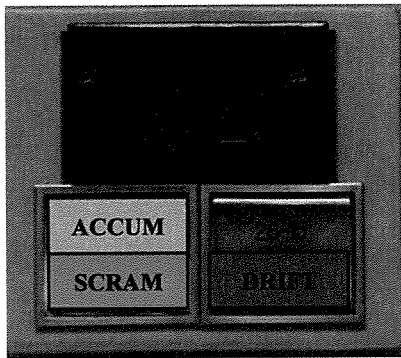
<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295031 EA1.05	
	Importance Rating	4.3	
295031 EA1.05 Ability to operate and/or monitor the following as they apply to Reactor Low Water Level: Reactor core isolation system: Plant-Specific			
<p>Explanation: <b>Answer A is Correct</b> - With the transient of a high Reactor Water Level trip of the RCIC system the FCV-71-8 Steam Supply Valve goes closed and will remain closed until a low level setpoint ((-) 45 inches) is reached causing it to reopen and reinject without operator actions, unless the operator wants to reinject before the (-) 45 inch setpoint is reached. Then all that is required to do is to reopen the FCV-71-8 valve admitting steam to the turbine.</p> <p>B. Depress the RCIC Turbine Trip Reset Pushbutton only is incorrect because the Trip and Throttle Valve FCV-71-9 does not get a trip signal on a high reactor water level. It is plausible because all other trips do close the FCV-71-9 valve.</p> <p>C. Depress the RCIC Turbine Trip Reset Pushbutton and reopen the RCIC Turbine Trip and Throttle Valve (2-FCV-71-9) is incorrect because the Trip and Throttle Valve FCV-71-9 does not get a trip signal on a high reactor water level. It is plausible because all other trips do close the FCV-71-9 valve and that the turbine trip reset would also have to be reset before it would reopen which is the normal trip response for all trips except the high level trip.</p> <p>D. Depress the RCIC High Reactor Water Level Trip Reset Pushbutton and reopen the Steam Supply Valve (FCV-71-8) is incorrect because RCIC does not have a High Reactor Water Level Trip reset pushbutton, like HPCI has. Plausible because the systems are so similar in all other aspects however different in that the high level trip does not seal in on RCIC.</p>			
Technical Reference(s): OPL171.040 Rev 23, 2-OI-71 Rev 68			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): ILT 10			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: N/A	
Question Cognitive Level:		Memory or Fundamental Knowledge Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 17 Rev 3**

An ATWS has occurred on Unit 2.

The following conditions currently exist:

- Reactor Power 35%
- The current display for Control Rod 26-15 is indicated below.
- 2-EOI Appendix-1F, Manual Scram, is in progress.
- 2-EOI Appendix-1D, Insert Control Rods Using Reactor Manual Control System is in progress.



Which ONE of the following completes the statements below?

The position of Control Rod 26-15 will be known \_\_ (1) \_\_.

The **PRESENCE** of the blue light for Control Rod 26-15 indicates that \_\_ (2) \_\_.

- A. (1) **only** after the control rod is being inserted in accordance with Appendix 1D  
(2) one of the scram valves is open
- B. (1) **only** after the control rod is being inserted in accordance with Appendix 1D  
(2) both of the scram valves are open
- C. (1) shortly after the scram is reset in accordance with Appendix 1F  
(2) one of the scram valves is open
- D. (1) shortly after the scram is reset in accordance with Appendix 1F  
(2) both of the scram valves are open

Answer: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295037 EA1.08	
	Importance Rating	3.6	
295037 EA1.08 Ability to operate and/or monitor the following as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: Rod control and information system: Plant-specific			
<p>Explanation: Answer D: Shortly after the scram is reset the control rods will settle into an even number position and the position will be known at that time. The presence of a blue light indicates that both scram valves are open; the absence of the blue light indicates that at least one or both scram valves are closed.</p> <p>A – Incorrect – First part Incorrect– see C above Second part Incorrect–see B above</p> <p>B – Incorrect – First part Incorrect– plausible in that once the control rod is being inserted position indication will be available but that is not the only time position indication will be available. Second part Correct</p> <p>C – Incorrect – First part Correct. Second part Incorrect – plausible in that a limit switch opens when each of the scram valves opens and inputs into the blue light circuit.</p>			
Technical Reference(s): OPL171.029 Rev 13, 2-OI-85 Rev 139, Unit 2 Simulator, Prints			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.029 V.B.1, 6 and 7			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis: X	
10 CFR Part 55 Content: 55.41 (b)(6)			

**QUESTION 18    Rev 2**

Which of the following alarms if valid require an immediate action to manually scram the Reactor to limit Off-Site Release Rate?

- A. OG POST TREATMENT RADIATION HIGH-HIGH-HIGH
- B. OG PRETREATMENT RADIATION HIGH
- C. CARBON BED VAULT RADIATION HIGH
- D. OG AVG ANNUAL RELEASE LIMIT EXCEEDED

Answer: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295038 EK2.02	
	Importance Rating	3.6	
295038 EK2.02 Knowledge of the interrelations between High Off-Site Release Rate and the following: Offgas system			
<p>Explanation: <b>Answer A:</b> With a valid OG POST TREATMENT RADIATION HIGH-HIGH-HIGH the ARP directs the operator to 2-AOI-66-2. An immediate action of 2-AOI-66-2 is to scram.</p> <p>B – Incorrect –Plausible in that the ARP for OG Pretreatment radiation high states: if directed by the US lower power to maintain within the ODCM limits.</p> <p>C – Incorrect –Plausible in that the ARP for the Carbon Bed Vault Radiation High has the operator check the release rate against the ODCM limit and if exceeded refers to EPIP-1.</p> <p>D – Incorrect – Plausible in that the ARP for the OG AVG ANNUAL RELEASE LIMIT EXCEEDED alarm states: if directed by the US or SM lower power to maintain within the ODCM limits. If the ODCM limits are exceeded it refers the operator to EPIP-1.</p>			
Technical Reference(s): 2-ARP-9-4C			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.033 Rev. 14 V.B.3.b and k and V.B.5			
Question Source:		Bank: Modified Bank: X New	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis    X	
10 CFR Part 55 Content: 55.41 (b)(11)			

**QUESTION 18 BFN 1306 NRC**

Given the following conditions:

- Unit 2 is performing a startup
- STACK GAS RADIATION HIGH (2-9-3A, Window 13) is in alarm
- OG POST-TREATMENT RADIATION HIGH, (2-9-4C, Window 33) is in alarm
- OG POST TREATMENT RADIATION HIGH-HIGH (2-9-4C, Window 34) is in alarm
- OG POST-TREATMENT CH A RAD MON RTMR, 2-RM-90-265A, is reading  $6.5 \times 10^4$  cps
- OG POST-TREATMENT CH B RAD MON RTMR, 2-RM-90-265B, is reading  $6.3 \times 10^4$  cps
- The Off Gas Treatment Select Switch, 2-XS-66-113, is in **BYPASS**

Which ONE of the following identifies the AUTOMATIC actions (if any) of the Offgas system to limit the offsite release rate?

- A. Adsorber Bypass Valve, 2-FCV-66-113B will CLOSE.  
Adsorber Inlet Valve, 2-FCV-66- 113A will OPEN  
Charcoal Adsorber Train 2 Inlet Valve, 2-FCV-66-118 will OPEN
- B. Adsorber Bypass Valve, 2-FCV-66-113B will CLOSE  
NO other valves will reposition
- C. Adsorber Bypass Valve, 2-FCV-66-113B will CLOSE  
Adsorber Inlet Valve, 2-FCV-66- 113A will OPEN  
NO other valves will reposition.
- D. NO valves will reposition

Correct Answer: **D**

**QUESTION 19 Rev. 3**

A loss of all off site power has occurred.

The following conditions exist:

- All DGs carrying their respective shutdown boards
- A spurious CO<sub>2</sub> initiation has been initiated in Diesel Generator B room

Which ONE of the following completes the statements below?

Diesel Generator B Exhaust Fan \_\_ (1) \_\_ and \_\_ (2) \_\_.

- A. (1) trips  
(2) ONLY the fire damper closes
- B. (1) remains operating  
(2) ONLY the fire damper closes
- C. (1) trips  
(2) the inlet and outlet dampers close
- D. (1) remains operating  
(2) the inlet and outlet dampers remain open

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	600000 AA2.02	
	Importance Rating	2.8	
600000 AA2.02 Ability to determine and interpret the following as they apply to Plant Fire On Site: Damper position			
<p>Explanation: <b>Answer C:</b> Exhaust fan trips and inlet and outlet dampers close on CO<sub>2</sub> initiation. The fire damper is located in the vent path and closes when a fusible link melts.</p> <p>A – Incorrect – First part Correct. Second part Incorrect plausible that the fire damper closes only since since CO<sub>2</sub> has initiated. The fire damper is located in the vent path and closes when a fusible link melts.</p> <p>B – Incorrect – First part is incorrect because the CO<sub>2</sub> initiation causes a direct trip of the fan motor. Second part Incorrect plausible that the fire damper closes only since CO<sub>2</sub> initiated. The fire damper is located in the vent path and closes when a fusible link melts.</p> <p>D – Incorrect – First incorrect see B above. Second part Incorrect plausible if the student only remembers that the fire damper is located in the vent path and closes when a fusible link melts.</p>			
Technical Reference(s): OPL171.067 Rev 18			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.067 Rev. 18, L.O. ILT 2.i			
Question Source:		Bank: Modified Bank: New X	
Question History:		Previous NRC:	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41(b)(7)	



**QUESTION 20    Rev 1**

0-AOI-57-1E, Grid Instability, has been entered by all three units.

Which ONE of the following completes the statements below?

In accordance with 0-AOI-57-1E, Grid Instability, to assist in maintaining grid stability, the UOs will adjust reactive power by varying generator \_\_ (1) \_\_.

0-AOI-57-1E states that for degrading voltage conditions the initial rising trend in pump amps will be indicated on 4KV UNIT boards 1C, 2C, and 3C because \_\_ (2) \_\_ .

- A. (1) frequency  
    (2) they carry a lighter electrical load
- B. (1) frequency  
    (2) they do not have tap changer regulation
- C. (1) voltage  
    (2) they carry a lighter electrical load
- D. (1) voltage  
    (2) they do not have tap changer regulation

Answer D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	700000 AK3.02	
	Importance Rating	3.6	
Knowledge of the reasons for the following responses as they apply to Generator Voltage and Grid Disturbances: Actions contained in abnormal operating procedure for voltage and grid disturbances			
<p>Explanation: <b>D is CORRECT</b> : Part 1 Reactive power (MVAR) is adjusted by varying generator voltage.  Part 2: Note on 0-AOI-57-1E page 8 states: Unit Board 1C, 2C, and 3C do not have Tap Changer regulation. Initial rising trend in pump amps will be indicated on these board loads first.</p> <p>A - Incorrect - First part Incorrect- plausible in that the grid instability AOI discusses generator or system frequency but the option to adjust frequency is not available, for frequency problems the operators adjust reactor power. Second part- Incorrect plausible in that these boards do not feed downstream 480V boards and typically carry fewer amps than the A or B 4KV UNIT boards.</p> <p>B – Incorrect – First part Incorrect-see A above  Second part Correct.</p> <p>C – Incorrect – First part Correct  Second part Incorrect- see A above.</p>			
Technical Reference(s): 0-AOI-57-1E Rev 11, 2-OI-47 Rev 171			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.074 V.B.2			
Question Source:	Bank: BFN Bank X Modified Bank: New:		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis    X		
10 CFR Part 55 Content:	55.41    (b)(5)		

**QUESTION 21     Rev 1**

Unit 2 is in the process of starting up and **Reactor Power is 20%** when the following conditions occur:

- CONDENSER A, B, OR C VACUUM LOW alarms (2-9-7B, window 17)
- Condensate temperature is 137 °F at the inlet to the SJAE
- A SJAE begins to stall

Which ONE of the following completes the statements below?

An Off Gas Panel 2-9-53 annunciator for this condition would be \_\_ (1) \_\_.

If vacuum continues to slowly degrade, your direction would be to \_\_ (2) \_\_ in accordance with 2-AOI-47-3, Loss of Condenser Vacuum.

- A. (1) OG HOLDUP LINE INLET FLOW LOW (2-9-53, window 4)  
(2) insert a manual scram and then trip the main turbine
- B. (1) OG HOLDUP LINE INLET FLOW LOW (2-9-53, window 4)  
(2) trip the main turbine ONLY
- C. (1) OG HOLDUP LINE INLET FLOW HIGH (2-9-53, window 14)  
(2) insert a manual scram and then trip the main turbine
- D. (1) OG HOLDUP LINE INLET FLOW HIGH (2-9-53, window 14)  
(2) trip the main turbine ONLY

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295002 G2.4.11	
	Importance Rating	4.0	
295002 Loss of Main Condenser Vacuum: Knowledge of abnormal condition procedures.			
<p>Explanation: <b>Answer B:</b> First part with SJAE Stalling given this would cause lowering off gas flow, the correct alarm would be LOW off gas flow. With power less than 30% the turbine should be tripped IAW the AOI.</p> <p>A – Incorrect - First part Correct. Second part Incorrect plausible in that above 30% this would be the correct direction so you do not receive an auto scram signal and if vacuum continues to degrade a scram may be eventually warranted but not at the current conditions.</p> <p>C – Incorrect - First part Incorrect plausible in that with vacuum lowering the alarm is usually off gas flow HIGH due to condenser inleakage, if the applicant is unsure what SJAE stalling may look like this would be the plausible choice. Second part Incorrect see A above.</p> <p>D – Incorrect – First part Incorrect see C above and second part Correct</p>			
Technical Reference(s): 2-AOI-47-3 Rev 20, 2-ARP-9-53 Rev 38, 2-OI-66 Rev 108			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.-74 V.B.2			
Question Source:		Bank: Modified Bank: New   X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis   X	
10 CFR Part 55 Content:		55.41 (b) (10)	

## QUESTION 22

Unit 1 is at 100% Reactor Power when a failure of the Reactor Feed Water Control System results in a Reactor Scram on Reactor Water Low Level.

Which ONE of the following completes the statements below?

Immediately following the Scram, the FIRST signal that will cause the RWCU Pumps to trip is \_\_ (1) \_\_.

The RETURN ISOLATION VALVE, 1-FCV-69-12, will be \_\_ (2) \_\_.

- A. (1) System flow less than 56 gpm  
(2) closed
- B. (1) System flow less than 56 gpm  
(2) open
- C. (1) ISOLATION VALVES, 1-FCV-69-1 OR 1-FCV-69-2 NOT full open  
(2) closed
- D. (1) ISOLATION VALVES, 1-FCV-69-1 OR 1-FCV-69-2 NOT full open  
(2) open

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295009 AA1.04	
	Importance Rating	2.7	
295009 AA1.04 Ability to operate and/or monitor the following as they apply to Low Reactor Water Level: RWCU			
<p>Explanation: CORRECT C: Reactor Scram on low level indicates Reactor Level dropped less than (+) 2 inches. RWCU receives an Isolation Signal at this level. With the Isolation Signal, closure of ISOLATION VALVES, 1-FCV-69-1/2 and RETURN ISOLATION VALVE, 1-FCV-69-12 will occur. When ISOLATION VALVES, 1-FCV-69-1/2 are not full open, RWCU Pumps get a direct trip.</p> <p>A – Incorrect – First part Incorrect – plausible because this will cause a RWCU Pump trip but not for 30 seconds, so this is NOT first. Second part Correct.</p> <p>B – Incorrect – First part Incorrect see A above. Second part Incorrect – plausible the 69-1 and 69-2 are PCIS valves the 69-12 is NOT.</p> <p>D – Incorrect – First part Correct and Second part Incorrect see B above.</p>			
Technical Reference(s): 1-OI-69 Rev 63, 1-AOI-64-2A Rev 2			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.013 V.B.3			
Question Source:		Bank: BFN 0801 NRC #21 Modified Bank: New	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(7)	

## QUESTION 22

Unit 1 is at 100% Reactor Power when a failure of the Reactor Feed Water Control System results in a Reactor Scram on Reactor Water Low Level.

Which ONE of the following completes the statements below?

Immediately following the Scram, the **FIRST** signal that will cause the RWCU Pumps to trip is \_\_ (1) \_\_.

The RETURN ISOLATION VALVE, 1-FCV-69-12, will be \_\_ (2) \_\_.

- A. (1) System flow less than 56 gpm  
(2) closed
- B. (1) System flow less than 56 gpm  
(2) open
- C. (1) ISOLATION VALVES, 1-FCV-69-1 OR 1-FCV-69-2 NOT full open  
(2) closed
- D. (1) ISOLATION VALVES, 1-FCV-69-1 OR 1-FCV-69-2 NOT full open  
(2) open

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295009 AA1.04	
	Importance Rating	2.7	
295009 AA1.04 Ability to operate and/or monitor the following as they apply to Low Reactor Water Level: RWCU			
<p>Explanation: CORRECT C: Reactor Scram on low level indicates Reactor Level dropped less than (+) 2 inches. RWCU receives an Isolation Signal at this level. With the Isolation Signal, closure of ISOLATION VALVES, 1-FCV-69-1/2 and RETURN ISOLATION VALVE, 1-FCV-69-12 will occur. When ISOLATION VALVES, 1-FCV-69-1/2 are not full open, RWCU Pumps get a direct trip.</p> <p>A – Incorrect – First part Incorrect – plausible because this will cause a RWCU Pump trip but not for 30 seconds, so this is NOT first. Second part Correct.</p> <p>B – Incorrect – First part Incorrect see A above. Second part Incorrect – plausible the 69-1 and 69-2 are PCIS valves the 69-12 is NOT.</p> <p>D – Incorrect – First part Correct and Second part Incorrect see B above.</p>			
Technical Reference(s): 1-OI-69 Rev 63, 1-AOI-64-2A Rev 2			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.013 V.B.3			
Question Source:		Bank: BFN 0801 NRC #21 Modified Bank: New	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(7)	



### QUESTION 23 Rev 1

Unit 2 is operating at 100% rated power when an accident occurs resulting in fuel damage, high Drywell Pressure and an Offsite release. The Unit Supervisor is currently operating in:

- 2-EOI-2, Primary Containment Control
- 2-EOI-1, RPV Control

Which ONE of the following completes the statements below?

**Entry** into 0-EOI-4, Radioactivity Release Control is required when the gaseous offsite radioactivity release rate at or above that requiring declaration of \_\_ (1) \_\_ classification.

The preferred containment vent path to reduce the amount of radionuclides released in accordance with 2-EOI Appendix-13, Emergency Venting Primary Containment is from the \_\_ (2) \_\_.

- A. (1) an Alert  
(2) Drywell
- B. (1) an Alert  
(2) Suppression Chamber
- C. (1) a General Emergency  
(2) Drywell
- D. (1) a General Emergency  
(2) Suppression Chamber

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295017 AK1.02	
	Importance Rating	3.8	
295017 AK1.02: Knowledge of the operational implications of the following as they apply to High Off-Site Release Rate: Protection of the general public			
<p>Explanation: <b>Answer B:</b> Entry into 0EOI-04 is required when the gaseous offsite radioactivity release rate at or above that requiring an Alert. The preferred vent path is from the Suppression Chamber.</p> <p>A. Incorrect – First part correct – Second part Incorrect but plausible in that this is the <b>ONLY</b> other vent path in 2-EOI Appendix-13.</p> <p>C. Incorrect – First part Incorrect because entry into the EOI is at an Alert, not the General but it is plausible because that is the emergency classification that is contained within EOI 4 to Emergency depressurize before. Second part Incorrect but plausible in that this is the <b>ONLY</b> other vent path in 2-EOI Appendix-13.</p> <p>D. Incorrect – First part Incorrect because entry into the EOI is at an Alert, not the General but it is plausible because that is the emergency classification that is contained within EOI 4 to Emergency depressurize before. Second part is correct.</p>			
Technical Reference(s): 2-EOI Appendix-13 Rev 7, EOIPM 0-V-D Rev 1, 0-EOI-4 Rev 6			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.204 ILT 11, OPL171.203 ILT 9			
Question Source:	Bank: Modified Bank: New    X		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis    X		
10 CFR Part 55 Content:	55.41 (b)(10) Entry conditions to EOIs, preferred vent paths, and reasons for using the preferred vent path is expected knowledge for ROs		

**QUESTION 24    Rev 3**

What is the reason that the Reactor Scrams from the MSIVs getting 10% closed when a Group 1 Isolation occurs?

- A. To anticipate the loss of feedwater flow due to the loss of the Feed Water Pumps.
- B. To place the RPV at the lowest energy state in the event the MSIVs do not go full closed.
- C. To anticipate of the loss the normal heat sink and subsequent over-pressurization transient.
- D. To limit inventory loss from the reactor vessel.

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295020 AK3.01	
	Importance Rating	3.8	
295020 AK3.03 Knowledge of the reasons for the following responses as they apply to Inadvertent Containment Isolation: Reactor SCRAM			
<p>Explanation: <b>Answer C:</b> The MSIVs isolate and when the 90% open limit switch is actuated on a sufficient number of MSIV it triggers the RPS Logic to cause a reactor scrams. It does that in anticipation of the loss the normal heat sink and subsequent over-pressurization transient</p> <p>A. Incorrect, this is a reason for the low Reactor Water Level Scram at (+) 2 inches. Plausible because this will occur with the closing of the MSIVs but it is not the reason for the 10% closure limit switch Scram.</p> <p>B. Incorrect, this is the reason the reactor is scrammed while executing the EOIs for a steam line break. Plausible because it is an action to Scram the reactor if the Group 1 fails and there is a steam leak in the Secondary containment.</p> <p>D. Incorrect, this is a reason for the low Reactor Water Level Scram at (+) 2 inches. Plausible because this is the reason for the Group 1 Isolation and not the reason for the 10% closure limit switch Scram.</p>			
Technical Reference(s): OPL171.017 Rev 17			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.017 ILT 2.n			
Question Source:		Bank: X Modified Bank: New	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41 (b)(3)	

## QUESTION 25 Rev 1

Unit 3 is operating at 100% when a manual scram is inserted.

The following conditions currently exist:

- Reactor Level (+) 30 inches and stable, the lowest Reactor Level was (-) 25 inches
- Reactor Pressure is 958 psig and rising slowly
- Drywell Pressure remains stable at 1.5 psig
- RCIC is placed in level control in accordance with 3-EOI Appendix-5C, Injection System Lineup RCIC
- HPCI is placed in pressure control in accordance with 3-EOI Appendix-11C, Alternate RPV Pressure Control Systems HPCI Test Mode

**Subsequently**, Suppression Pool level starts rising and is currently at the following levels:

- 3-LI-64-54A, Suppression Pool Water Level, is reading (+) 6.0 inches
- 3-LI-64-66, Suppression Pool Water Level, is reading (+) 5.5 inches

Which System(s), if any, will remain in their current alignment?

- A. HPCI only
- B. RCIC only
- C. Both HPCI and RCIC
- D. Neither HPCI nor RCIC

Answer B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295029 G2.1.7	
	Importance Rating	4.4	
295029 High Suppression Pool Water Level: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.			
<p>Explanation: <b>Answer B:</b> RCIC suction does not swap and with no affect to any other valves RCIC will remain in level control. With suppression pool level of plus 5.25, HPCI suction will swap to the suppression pool and the pressure control valves to the CST will close and the minimum flow valve will not open. HPCI will be at shutoff head.</p> <p>A. Incorrect – With suppression pool level of plus 5.25, HPCI suction will swap to the suppression pool and the pressure control valves to the CST will close and the minimum flow valve will not open. HPCI will be at shutoff head.</p> <p>C. Incorrect – With suppression pool level of plus 5.25, HPCI suction will swap to the suppression pool and the pressure control valves to the CST will close and the minimum flow valve will not open. HPCI will be at shutoff head. but RCIC would still be in Level Control alignment.</p> <p>D. Incorrect – RCIC will continue in Level Control alignment because it does not have a Suppression Pool High Level Swap.</p>			
Technical Reference(s): 3-OI-73 Rev 55, 3-ARP-9-3F Rev 29			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.042 V.B.7			
Question Source:		Bank: Modified Bank: New X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis: X	
10 CFR Part 55 Content: 55.41 (b)(7)			

## QUESTION 26 Rev 1

Unit 3 is operating at 90% power.

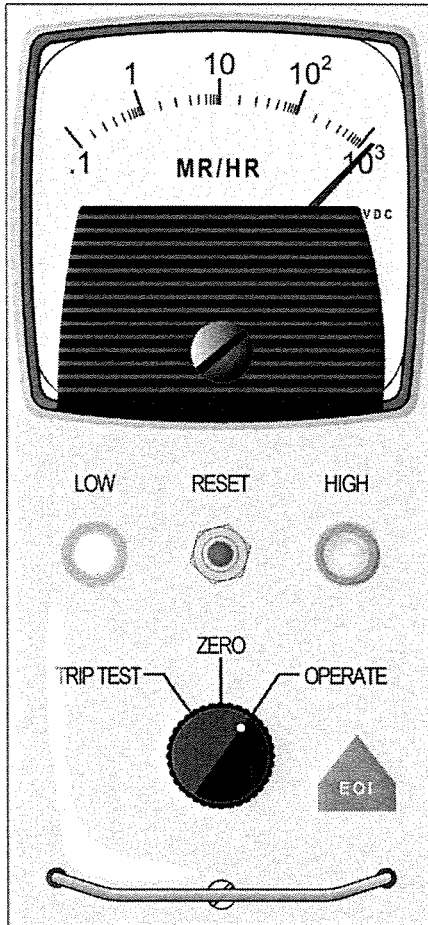
- An **un-isolable** primary system leak into secondary containment is in progress.

Based on the attached illustration, which Radiation Annunciator is currently in alarm and what action is required in accordance with the EOIs?

### Illustration Attached

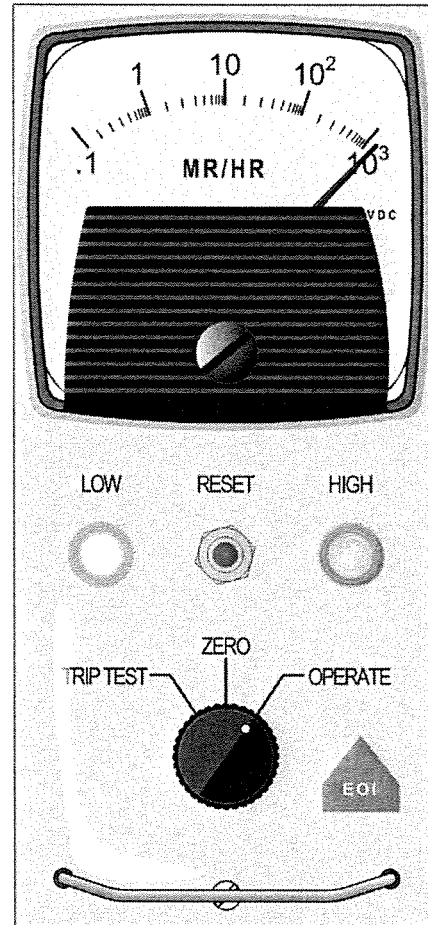
- A. (1) RX BLDG AREA RADIATION HIGH (3-9-3A, window 22)  
(2) Emergency Depressurize the RPV
- B. (1) RX BLDG AREA RADIATION HIGH (3-9-3A, window 22)  
(2) Insert a manual Scram **only**
- C. (1) STACK GAS RADIATION HIGH (3-9-3A, window 13)  
(2) Emergency Depressurize the RPV
- D. (1) STACK GAS RADIATION HIGH (3-9-3A, window 13)  
(2) Insert a manual Scram **only**

Answer: A



**N RWCU SYS AREA  
EL 593 RX BLDG**

3-RI-90-13A  
PANEL 3-9-9, BKR 306



**CORE SPRAY ROOM  
EL 519 RX BLDG**

3-RI-90-27A  
PANEL 3-9-9, BKR 306



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295033 EK2.01	
	Importance Rating	3.8	
295033 EK2.01 Knowledge of the interrelations between High Secondary Containment Area Radiation Levels and the following: Area radiation monitoring system			
<p>Explanation: <b>Answer A:</b> IAW the ARP this is one of the area radiation monitors that will cause this alarm. These area radiation monitors indicate that two areas have exceeded MAX Safe are affected so an ED is required.</p> <p>B – Incorrect – First part Correct. Second part Incorrect – plausible in that if the two area radiation monitors had been connected to the same area and exceeded MAX safe only a scram would be required.</p> <p>C – Incorrect – First part Incorrect plausible if applicant believes that the reactor building ventilation exhausts to the stack. Second part Correct see A above</p> <p>D – Incorrect – First part Incorrect see C above and second part Incorrect see B above.</p>			
Technical Reference(s): 3-EOI-3 Rev 13, EOIPM 0-V-E Rev 2, 3-ARP-9-3A Rev 45			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.204 ILT 6			
Question Source:	Bank: Modified Bank: New X		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis X		
10 CFR Part 55 Content:	55.41 (b)(11)		

**QUESTION 27 Rev 1**

Given the following conditions on Unit 2:

- Reactor Power is 100%
- RX BLDG VENTILATION ABNORMAL (2-9-3D, window 3) is in alarm
- The UO reports that:
  - 2A Reactor Zone Exhaust fan has tripped
  - 2B Reactor Zone Exhaust fan is tagged OOS
  - 2A Reactor Zone Supply fan is still running.

**Subsequently**, the 2A Reactor Zone Supply fan trips and the associated dampers close. The OATC reports that no PCIS isolation signals have been received but Amber light 2-ZI-064-0123 Reactor Zone Isolation indication is lit on Panel 2-9-25.

Which ONE of the following completes the statements below?

\_\_(1)\_\_ caused the 2A Reactor Zone Fan to trip.

In accordance with 2-AOI-30B-1 Reactor Building Ventilation Failure the UO should **FIRST** dispatch an AUO to \_\_(2)\_\_.

- A. (1) Low Reactor Zone pressure  
(2) Report Reactor Zone DP from 2-PDIC-64-2
- B. (1) Low Reactor Zone pressure  
(2) Verify the Steam Vault Exhaust Booster Fan is running
- C. (1) High Reactor Zone pressure  
(2) Report Reactor Zone DP from 2-PDIC-64-2
- D. (1) High Reactor Zone pressure  
(2) Verify the Steam Vault Exhaust Booster Fan is running

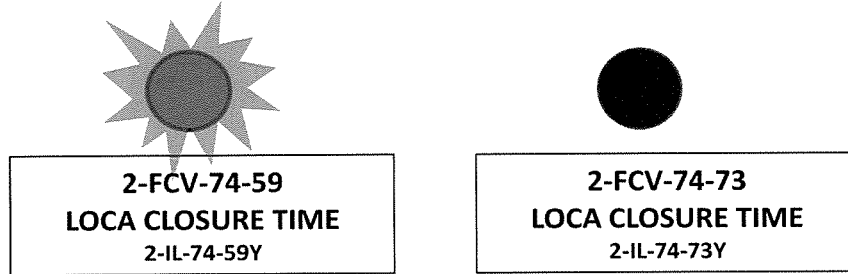
Answer: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295035 EA1.01	
	Importance Rating	3.6	
295035 E1.01 Ability to operate and / or monitor the following as they apply to Secondary Containment High Differential Pressure: Secondary Containment ventilation system			
<p>Explanation: Answer D:  Part 1-The 2A Reactor Zone Fan tripped due to high static pressure at +0.5 inches of water.  Part 2-In accordance with 2-AOI-30B-1 step 4.2[6] Verify the Steam Vault Exhaust Booster Fan is running (Reactor Building elevation 565 Top of the Tip Room).  A – Incorrect – First part Incorrect -plausible in that there is a low pressure static isolation at (-) 1.0 inches of H2O however, if this was the case 2-9-3D window 32 Reactor Zone Differential Pressure Low would have been in alarm at (-)0.17 inches of water. 2-9-3D window 32 was not mentioned in the stem of the question. Since no exhaust fans were running but the 2A Reactor Zone supply Fan was running the Reactor Building Pressure would tend to rise.  Second part Incorrect-plausible in that 2-AOI-30B-1 has steps that are dependent on the building DP however the priority is to ensure some air flow in the Steam Vault to prevent a group 1 PCIS isolation.  B – Incorrect – First part Incorrect see A above. Second part: Correct  C – Incorrect – First part correct. Second part, Incorrect see A above.</p>			
Technical Reference(s): 2-ARP-9-3D Rev 28; 2-AOI-30B-1 Rev 16; 2-OI-30B Rev 27; 2-45E614-5 and 6			
Proposed references to be provided to applicants during examination: NONE			
Learning Objective (As available): OPL171.067Rev 18 ILT objective 2.b and h			
Question Source:	Bank: Modified Bank: New: X		
Question History:	Previous NRC:		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis: X		
10 CFR Part 55 Content: 55.41 (b)(7)			

## QUESTION 28 Rev 2

Unit 2 is operating at 100% power with the following initial conditions:

- Suppression Pool Temperature is 97°F
- RHR Loop I and II are in Suppression Pool Cooling
- The current status of the LOCA closure time lights (Div I and Div II) are depicted below



- Subsequently, Recirc Pump 2B Discharge Valve, 2-FCV-068-0079 is declared inoperable with 480V RMOV BD 2D compartment 3E breaker open

What is the operability status of both RHR LPCI Loops?

- A. Loop I is **inoperable** but Loop II is **operable**
- B. Loop I is **operable** but Loop II is **inoperable**
- C. Both Loop I and Loop II are **inoperable**
- D. Both Loop I and Loop II are **operable**

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	203000 G2.2.38	
	Importance Rating	3.6	
203000 RHR/LPCI: Injection Mode (Plant Specific): Knowledge of conditions and limitations in the facility license.			
<p>Explanation: <b>Answer C:</b> With the RR Pump 2B discharge valve inoperable and de-energized in the open position RHR Loop I LPCI is inoperable. Since the LOCA closure time light for the 2-74-73 is illuminated, means that being in Suppression Pool Cooling does affect the operability of Loop II RHR LPCI so Loop II is inoperable as well.</p> <p>A – Incorrect – Loop I is not operable, with the 2B RR Discharge Valve de-energized open that Loop of RHR LPCI injection could bypass the core during a LOCA. Second part with the 2-74-59 light too far open the injection time will not meet the requirements for LPCI Injection and would be inoperable</p> <p>B – Incorrect – Due to the reasons listed above, both loops are inoperable.</p> <p>D – Incorrect – Due to the reasons listed above, both loops are inoperable.</p>			
Technical Reference(s): 2-OI-74 Rev 169, Tech Spec 3.5.1 Bases Rev 76			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.044 ILT 7			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41(b)(7)	

**QUESTION 29    Rev 1**

Unit 3 is in cold shutdown with the 3A RHR pump in Shut Down Cooling.

**Subsequently**, the Unit 3 Reactor water level lowers to 0 inches.

Which ONE of the following completes the statements below?

Based on the current RPV water level the RHR System I LPCI \_\_\_\_(1)\_\_\_ automatically closes.

RHR Pump 3A will \_\_\_\_(2)\_\_\_.

- A. (1) Inboard Injection Valve  
(2) trip on low suction pressure
- B. (1) Inboard Injection Valve  
(2) trip due to suction path interlock
- C. (1) Outboard Injection Valve  
(2) ~~trip~~ on low suction pressure
- D. (1) Outboard Injection Valve  
(2) ~~trip~~ due to suction path interlock

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	205000 K6.04	
	Importance Rating	3.6	
205000 Shutdown Cooling System (RHR Shutdown Cooling Mode) K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the Shutdown Cooling System (RHR Shutdown Cooling Mode): Reactor Water Level			
<p>Explanation: <b>Answer B:</b></p> <p>Part 1-Reactor Water level is less than the Group II PCIS isolation signal of (+) 2 inches, 3-FCV-74-53 RHR System I LPCI Inboard Injection Valve will isolate.</p> <p>Part 2- RHR pump 3A will trip due to suction path interlock when RHR SHUTDOWN COOLING SUCT OUTBD and INBD ISOL VLVs, 2-FCV-74-47 and 2-FCV-74-48 start to close.</p> <p>A – Incorrect – First part Correct.</p> <p>Second part Incorrect– plausible in that numerous other pumps at BFN do trip on low suction pressure.</p> <p>C – Incorrect – First part Incorrect– plausible in that both inboard and outboard valves get open signals on LPCI initiation, either valve could be assigned to either logic.</p> <p>Second part–Incorrect–see A above</p> <p>D – Incorrect – First part Incorrect– see C above</p> <p>Second part Correct–see B above</p>			
Technical Reference(s): 3-OI-74 Rev 115, 3-AOI-74-1 Rev 24			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available):OPL171.044 Rev 19 ILT 4 and 9			
Question Source:		Bank:	
		Modified Bank:	
		New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge:	
		Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 30    Rev. 1**

The power supply to the Unit 1 HPCI turbine trip circuit is \_\_\_\_\_?

- A. 250VDC RMOV BD 1A
- B. 250VDC RMOV BD 1B
- C. DIV I ECCS INVERTER
- D. DIV II ECCS INVERTER

Answer: A



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	206000 K2.04	
	Importance Rating	2.5	
HPCI K2.04 Knowledge of electrical power supplies to the following: Turbine control circuits BWR-2,3,4			
<p>Explanation: <b>Answer A:</b> Relay Logic Bus B (Div II) is powered from 250V RMOV 1A. It supplies power to the initiation logic, turbine trip logic, and B (Div II) Channel isolation logic.</p> <p>B – Incorrect – Incorrect, plausible if RMOV B powers Logic Bus B.</p> <p>C – Incorrect – Incorrect, plausible if the ECCS inverter powers the HPCI logic.</p> <p>D – Incorrect – Incorrect, plausible. See C above.</p>			
Technical Reference(s): 1-ARP-9-3F Rev 20, OPL171.042 Rev. 20			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.042 Rev. 20, ILT L.O. 5			
Question Source:		Bank: Modified Bank: New      X	
Question History:		Previous NRC: NO	
Question Cognitive Level:		Memory or Fundamental Knowledge   X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(7)	

### QUESTION 31 Rev 3

Unit 2 is in Mode 3 with the following conditions:

- Reactor Pressure is 300 psig
- Reactor Water Level is (-)10 inches

Reactor water level is being restored using Core Spray.

Which ONE of the following correctly describes the valve logic?

When manually aligning Core Spray to inject, the Core Spray SYS I \_\_ (1) \_\_ INJECT VALVE must be opened first.

When closing CORE SPRAY SYS I INBD INJECT VALVE, 2-FCV-75-25, why must the UO hold the hand switch in the CLOSE position after the red light is extinguished? (2)

- A. (1) OUTBOARD  
(2) To ensure the torque switch stops valve movement.
- B. (1) OUTBOARD  
(2) To ensure the limit switch stops valve movement.
- C. (1) INBOARD  
(2) To ensure the torque switch stops valve movement.
- D. (1) INBOARD  
(2) To ensure the limit switch stops valve movement.

Answer: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	209001 A4.03	
	Importance Rating	3.7	
LPCS A4.03 Ability to manually operate and/or monitor in the control room: Injection valves			
<p>Explanation: <b>Answer A: Part 1-</b> The OUTBOARD injection valve must be opened/verified open first. If the INBOARD injection valve is opened first the OUTBOARD injection valve cannot be opened using the control room handswitch.</p> <p>Part 2- Holding the switch for ~6 seconds after the red light goes out will ensure that the torque switch has time to operate to provide complete valve closure.</p> <p>B – Incorrect – First part– Correct. Second part – Incorrect plausible in that many valve control circuits at BFN contain both limit switches and torque switches.</p> <p>C – Incorrect – First part Incorrect – plausible that the candidate could mistake which valve must be opened first. Second part – Correct</p> <p>D – Incorrect – First part Incorrect see C above Second part – Incorrect see B above</p>			
Technical Reference(s): 2-OI-75 Rev 107, OPL171.045 Rev 15			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.045 Rev 17 ILT 2.a ; 2.j ; and 6			
Question Source:	Bank: Modified Bank: New: X		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis X		
10 CFR Part 55 Content:	55.41 (b)(7)		

### QUESTION 32

Unit 2 was operating at 100% Reactor Power, when a plant event resulted in a reactor scram **AND** loss of 250VDC RMOV BD 2A. Degrading plant conditions have resulted in the following:

- Reactor Pressure is 325 psig and stable
- Drywell Pressure is 2.8 psig

Based on the above conditions, which ONE of the following predicts how Core Spray will be affected by the bus loss?

- A. ONLY the Loop 1 Core Spray pumps will start and Loop 1 injection valves will open. –
- B. ONLY the Loop 2 Core Spray pumps will start and Loop 2 injection valves will open.
- C. ALL Core Spray pumps will start and ALL injection valves will open.
- D. ONLY the Loop 1 Core Spray pumps will start and NO injection valves will open.

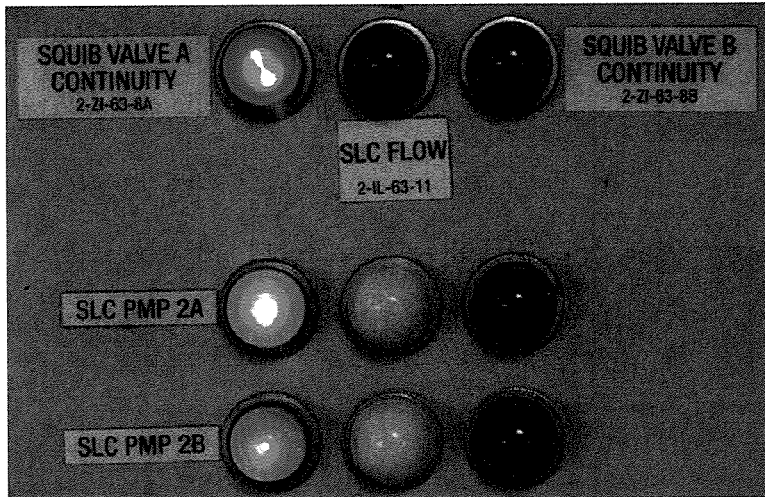
Answer: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	209001 K6.04	
	Importance Rating	2.8	
209001 Low Pressure Core Spray System K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the Low Pressure Core Spray System: DC Power			
<p>Explanation: <b>Answer A:</b> Core Spray system logic is still energized from 250VDC RMOV BD 2B, Core Spray Loop 1 operates as designed.</p> <p>B – Incorrect plausible in that if 250VDC RMOV BD 2A was lost this would be correct.</p> <p>C – Incorrect plausible if the logic power is not divisionalized and a signal to start should start and allow core spray injection.</p> <p>D – Incorrect plausible if losing 250VDC RMOV BD 2A causes a loss of ability for the valve control circuit to sense reactor pressure less than 450 psig and injection valves cannot be opened electrically.</p>			
Technical Reference(s): 2-ARP-9-3C Rev 24, 2-ARP-9-3F Rev 20, 2-AOI-57-11 Rev 10			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.045 V.B.3 and 4			
Question Source:	Bank: BFN NRC 1102 #31 Modified Bank: New:		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis X		
10 CFR Part 55 Content:	55.41 (b)(7)		

### QUESTION 33 Rev. 1

Unit 2 is at 40% power when the following occurs:

- SLC SQUIB VALVE CONTINUITY LOST, (2-9-5B, window 20) alarms
- The indications on Panel 2-9-5 are given below
- XM-63-8A indicates 3.5 milliamps
- XM-63-8B indicates 0 milliamps



Which ONE of the following completes the statement below?

**Subsequently** if an ATWS occurs and it is determined that boron injection is required, boron \_\_\_\_\_.

#### Illustration Attached

- A. can be injected with SLC Pump 2A ONLY
- B. can be injected with SLC Pump 2B ONLY
- C. can be injected with SLC Pump 2A OR 2B
- D. cannot be injected with either SLC Pump.

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	211000 A2.02	
	Importance Rating	3.6	
211000 Standby Liquid Control System A2.02 Ability to (a) predict the impacts of the following on the SLC System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure of explosive valve to fire			
<p>Explanation: <b>Answer C:</b> Taking the SLC start handswitch to either start 2A or 2B will fire both squibs and both squibs provide 100% flow.</p> <p>A – Incorrect – plausible for one it is partially correct and it is the only squib with an illuminated squib valve light so if they believe 2A fires A squib then this would be correct.</p> <p>B – Incorrect – plausible once again because it is partially correct and if they believe that the B squib is fired and open they would choice the 2B pump, in somewhat the same argument as the A distractor.</p> <p>D – Incorrect – plausible for the given milliamp readings and the alarm being in may be low enough to the squibs that they do not have the necessary amps to fire (need 3 amps minimum) and if the squibs will not fire, SLC would have to be injected using alternate means.</p>			
Technical Reference(s): 2-ARP-9-5B Rev 27, 2-OI-63 Rev 35, 2-EOI Appendix-3A Rev 6			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.039 Rev. 17, L.O. ILT 9			
Question Source:		Bank:	
		Modified Bank:	
		New:	X
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge	
		Comprehension or Analysis    X	
10 CFR Part 55 Content:		55.41 (b)(10)	

### QUESTION 34 Rev 2

A Unit 1 startup is in progress.

- Reactor power has been raised to 40% rated thermal power.
- OATC reports TURB CV FAST CLOSURE TURB SV CLOSURE SCRAM/RPT TRIP LOGIC BYPASS (1-XA-55-5B window 16) is in alarm.
- Upon investigation, Control Bay AUO reports that 1-RLY-099-05AK09C is energized.

This condition would prevent RPS channel \_\_\_\_ (1) \_\_\_\_ from de-energizing if the Main Turbine trips.

In accordance with 1-OI-99, pulling fuse \_\_\_\_ (2) \_\_\_\_ would correct this condition.

### REFERENCE PROVIDED

- A. (1) B2  
(2) 1-FU1-001-0081AA
- B. (1) A2  
(2) 1-FU1-001-0081AA
- C. (1) B2  
(2) 1-FU1-001-0081BA
- D. (1) A2  
(2) 1-FU1-001-0081BA

Answer: D



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	212000 A2.21	
	Importance Rating	3.6	
<p>212000 Reactor Protection System A2.21 Ability to (a) predict the impacts of the following on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure of individual relays to reposition: Plant-Specific</p>			
<p>Explanation: <b>Answer D:</b> With the 1-RLY-099-05AK09C relay energized the RPS A2 channel will not de-energize on a Main Turbine trip. The Turbine stop valve closure and the turbine control valve fast closure relay contacts will be bypassed by contacts from <del>1-RLY-099-05AK09C.</del></p> <p>Pulling fuse 1-FU1-001-0081BA will de-energize 1-RLY-099-05AK09C and disable the bypass.</p> <p>A. Incorrect –Part 1– Plausible in that the channel B2 fuse is 1-FU1-001-0081<u>AA</u>  Part 2–Plausible in that the channel A2 fuse is 1-FU1-001-0081<u>BA</u>.</p> <p>B. Incorrect – Part 1– correct Part 2 – incorrect see A above</p> <p>C. Incorrect – Part 1 incorrect see A above Part 2 – correct</p>			
<p>Technical Reference(s): 1-OI-99 Rev 45; 730E915 sheet 9 and 11; Simulator</p>			
<p>Proposed references to be provided to applicants during examination: 1-OI-99 illustration 3 page 4</p>			
<p>Learning Objective (As available): OPL171.028 Rev 19 ILT objective 19 and 20</p>			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC:	
Question Cognitive Level:		Memory or Fundamental Knowledge Comprehension or Analysis: X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 35 Rev 3**

Unit 1 is in MODE 2.

- All IRMs are on **Range 4**
- All IRMs are reading **15/125**

Subsequently,

- IRM A is ranged up to **Range 5**
- IRM B reading slowly rises to **106/125**

Which of the following describes the effect of these IRM changes on the Reactor Manual Control System?

- A. Only IRM A will produce a Rod Block
- B. Only IRM B will produce a Rod Block
- C. Both IRM A and IRM B will produce a Rod Block
- D. Neither IRM A nor IRM B will produce a Rod Block

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215003 K1.02	
	Importance Rating	3.6	
Knowledge of the physical connections and/or cause effect relationships between (IRM) SYSTEM and the following: Reactor manual control			
<p>Explanation: <b>Answer C:</b> Both IRM A and IRM B will produce a Rod Block. As IRM A is ranged up it will fall below the downscale setpoint of 7.5/125, and as IRM B slowly fails up, it exceeds the high setpoint for Rod Blocks.</p> <p>A. Incorrect since IRM A will be on Range 2 and downscale, that will produce a Rod Block within the Reactor Manual Control System, but so will IRM B.</p> <p>B. Incorrect since IRM B fails high it will produce a Rod Block but so will IRM A going low.</p> <p>D. Incorrect since IRM A and B are beyond their setpoints a Rod Block will be generated in both. However a miscalculation of the affects that ranging will have on IRM A and since the high setpoint is very close to the value given both might not have come in yet.</p>			
Technical Reference(s): OPL171.020, OPL171.029			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.020 V.B.5			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content: 55.41 (b)(2)			

**QUESTION 36 Rev 1**

Which ONE of the following completes the statements below?

Readings on each IRM range scale change by a factor of \_\_ (1) \_\_ when the IRM is ranged up or down.

When switching an IRM channel from range \_\_ (2) \_\_ a different preamplifier is put into service.

- A. (1)  $e$  (2.72)  
(2) 5 to 6
- B. (1)  $e$  (2.72)  
(2) 6 to 7
- C. (1)  $\sqrt{10}$  (3.16)  
(2) 5 to 6
- D. (1)  $\sqrt{10}$  (3.16)  
(2) 6 to 7

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215003 K4.04	
	Importance Rating	2.9	
Knowledge of IRM SYSTEM design feature(s) and/or interlocks which provide for the following: Varying system sensitivity levels using range switches			
<p>Explanation: <b>Answer D:</b> IRM channels differ by the square root of 10. When switching from Range 6 to range 7 a different pre-amplifier is placed in service.</p> <p>A – Incorrect - First part Incorrect plausible since there are two common log bases one is 10 and the other is the natural log. Second part Incorrect plausible since there are 10 range position that half would be one pre-amp and the second half would be the other.</p> <p>B – Incorrect – First part Incorrect see A above and second part Correct.</p> <p>C – Incorrect – First part Correct and second part Incorrect see A above.</p>			
Technical Reference(s): 2-OI-92A Rev 29, OPL171.020 Rev 11			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.020 V.B.13			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55Content: 55.41 (b)(2)			

### QUESTION 37

Unit 1 Reactor startup is in progress.

The OATC operator reports the following after withdrawing a control rod a single notch.

- SRM PERIOD (1-9-5A, Window 20) sealed in
- Stable SRM period

Which ONE of the following completes the statements below?

The OATC is required to \_\_\_\_ (1) \_\_\_\_.

The setpoint for SRM PERIOD (1-9-5A, window 20) alarm is \_\_\_\_ (2) \_\_\_\_.

- A. (1) insert the last control rod pulled  
(2) 30 seconds
- B. (1) insert the last control rod pulled  
(2) 60 seconds
- C. (1) insert control rods in accordance with 3-SR-3.1.2.5(A)  
(2) 30 seconds
- D. (1) insert control rods in accordance with 3-SR-3.1.2.5(A)  
(2) 60 seconds

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215004 A1.05	
	Importance Rating	3.6	
Ability to predict and/or monitor changes in parameters associated with operating the Source Range Monitor System including: SCRAM, rod block, and period alarm trip setpoints			
<p>Explanation: <b>Answer C:</b> Reactor period is less than 30 seconds which will bring in the reactor period annunciator. With reactor period less than 30 seconds the operator is required to insert control rods, following the SR, until the reactor is subcritical.</p> <p>A – Incorrect – First part Incorrect plausible in that this is the required action if reactor period is less than 60 seconds. Second part Correct.</p> <p>B – Incorrect – First part Incorrect plausible, See A above. Second part Incorrect plausible if the applicant believes that 60 seconds is the alarm setpoint.</p> <p>D – Incorrect – First part Correct. Second part Incorrect, see B above.</p>			
Technical Reference(s): 1-OI-92, 1-GOI-100-1A, 1-ARP-9-5A			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.019 V.B.11			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis: X	
10 CFR Part 55 Content: 55.41 (b)(2)			

### QUESTION 38 Rev 3

A plant start up on Unit 3 is in progress. A control rod block has occurred. The SRMs are in the following conditions:

- SRM A is **fully inserted** into the Core and is reading  $7.1 \times 10^5$  CPS.
- SRM B is **at an intermediate position** and is reading **105 CPS**.
- SRM C is **at an intermediate position** and is reading **150 CPS**.
- SRM D is **fully inserted** into the Core and is reading  $8.0 \times 10^3$  CPS.
- **All IRMs are on Range 1**

Which ONE of the following identifies the **MINIMUM** action needed to clear the Rod Withdrawal Block?

- E. Insert SRM B **only**.
- F. Insert SRM C **only**.
- G. Bypass SRM A **and** Insert SRM B.
- H. Bypass SRM A **and** Insert SRM C.

ANSWER: C



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215004 K5.03	
	Importance Rating	2.8	
215004 K5.03 Knowledge of the operation implications of the following concepts as they apply to Source Range Monitor System: Changing detector position			
<p>Explanation: <b>Answer C:</b> SRM RETRACT NOT PERMITTED will alarm and cause a rod block with SRM counts &lt;145cps with associated IRMs ≤ Range 2 and the Detector not Full In. Also the High Rod Block for the SRMs is set at <math>6.8 \times 10^4</math> cps, SRM A has to be Bypassed and SRM B detector will need to be inserted to clear all Rod Blocks.</p> <p>A. Incorrect - By only inserting the B detector the Rod Block will still be in caused by the Upscale condition on SRM A</p> <p>B. Incorrect - SRM C is not causing a Rod Block the setpoint is 145 cps and not full in, it is plausible that the SRM would be causing the rod block if it's reading were just a few counts lower.</p> <p>D. Incorrect - SRM C is not causing a Rod Block the setpoint is 145 cps and not full in, it is plausible that the SRM would be causing the rod block if it's reading were just a few counts lower. And that would still be wrong because SRM B would still be causing the rod block.</p>			
Technical Reference(s): 3-OI-92 Rev 16			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.019 V.B.8			
Question Source:	Bank: BFN NRC 1006 #37 Modified Bank: New:		
Question History:	Previous NRC: BFN NRC 1006 #37		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis : X		
10 CFR Part 55 Content:	55.41 (b)(2)		

### QUESTION 39

Which ONE of the following completes the statement below?

Having less than \_\_\_\_ (1) \_\_\_\_ LPRM detectors per channel OR less than \_\_\_\_ (2) \_\_\_\_ LPRM detectors per level will yield the associated APRM channel INOP condition (i.e. Rod Block).

A. (1) 20  
(2) 2

B. (1) 20  
(2) 3

C. (1) 23  
(2) 2

D. (1) 23  
(2) 3

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215005 K4.01	
	Importance Rating	2.8	
215005 K4.01 Knowledge of APRM/LPRM System design feature(s) and/or interlocks which provide for the following: Rod withdrawal blocks			
<p>Explanation: <b>CORRECT B:</b> The minimum number of LPRMs which are required per detector channel is 20. The minimum number of LPRMs required per level is 3.</p> <p>A – Incorrect – First part Correct. Second part Incorrect 2 LPRMs per level is plausible since a cell is inop when it has &lt;2 operable LPRMs.</p> <p>C – Incorrect – First part Incorrect 23 LPRMs is plausible since the total number of LPRM inputs for the APRM channel that may be bypassed is 23. Second part - Incorrect see A above.</p> <p>D – Incorrect – First part Incorrect see C above and second part Correct.</p>			
Technical Reference(s): 2-OI-92B Rev 39			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.148 ILT 7.b			
Question Source:		Bank: X Modified Bank: New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(2)	

**QUESTION 40    Rev 1**

Unit 3 is operating at 100% power when the unit scrams.

Reactor water level lowered to the initiation setpoint for RCIC injection.

Reactor water level recovered and **RCIC is tripped on high level.**

Which ONE of the following completes the statement below?  
(Assume NO operator action)

The RCIC Steam Line Drain Pot is currently aligned to the \_\_\_\_.

- A. Suppression Pool
- B. Reactor Building Equipment Drain sump
- C. Main Condenser
- D. RCIC pump suction

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	217000 K1.04	
	Importance Rating	2.6	
217000 Knowledge of the physical connections and/or cause effect relationships between RCIC SYSTEM and the following: Main condenser			
<p>Explanation: <b>CORRECT C:</b> The RCIC steam line Drain pot is currently draining to the main condenser since the RCIC Steam Line Drain inbd and outbd isolation valves will auto open when the 71-8 closes on RPV water level of + 51".</p> <p>A – Incorrect - the Torus is plausible since the Barometric Condenser (which receives other steam drainage) has a vacuum pump which discharges non-condensables to the Torus.</p> <p>B – Incorrect – Reactor Building Equipment Drain Sump is plausible since the Barometric Condenser (which receives other steam drainage) normally drains to CRW during standby conditions.</p> <p>D – Incorrect - the RCIC pump suction is plausible since the Barometric Condenser (which receives other steam drainage) is pumped via its condensate pump to the RCIC pump suction during RCIC operation.</p>			
Technical Reference(s): 3-OI-71			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.040 ILT 6			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis: X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 41 Rev 1**

Unit 3 is operating at 100% power, when the reactor scrams due to a LOCA.

At time 09:02:00

- REACTOR LEVEL LOW ADS BLOWDOWN PERMISSIVE (3-9-3C, window 3) alarmed

At time 09:06:00

- DRYWELL PRESS APPROACHING SCRAM (3-9-3B, window 30) alarmed
- RX WTR LOW LOW LOW ECCS/ESF INIT (3-9-3C, window 28) alarmed
- RHR OR CS PUMPS RUNNING ADS BLOWDOWN PERMISSIVE (3-9-3C, window 10) alarmed

At time 09:07:00

- DRYWELL PRESSURE HIGH HALF SCRAM (3-9-4A, window 8) alarmed

Which ONE of the following completes the statement below?

ADS will actuate at time \_\_\_\_.

- A. 09:07:35
- B. 09:08:35
- C. 09:10:25
- D. 09:12:00

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	218000 K5.01	
	Importance Rating	3.8	
218000 K5.01 Knowledge of the operational implications of the following concepts as they apply to ADS System: ADS logic operation			
<p>Explanation: <b>CORRECT B:</b> ADS will initiate after 95 seconds with a Reactor water level of -122 inches and a drywell pressure of 2.45 psig. At time 0908 +35 seconds those conditions are met.</p> <p>A – Incorrect - Time 09:07:35 is plausible since it is 95 seconds after -122 inches has been reached. 95 seconds is the timer for high DW pressure and RPV level 1. However, given level alone, ADS would not initiate until 360 seconds after this level is reached.</p> <p>C – Incorrect - Time 09:10:25 is plausible since it is 265 seconds after -122 inches has been reached. 265 seconds at level 1 will start the 95 second timer if no high drywell pressure condition exists.</p> <p>D – Incorrect - Time 09:12:00 is plausible since this is 360 seconds after RPV level 1 was reached, ADS would initiate at this time if a High DW pressure did not exist.</p>			
Technical Reference(s): 3-OI-1 Rev 41, 3-ARP-9-3B Rev 21, 3-ARP-9-3C Rev 28, 3-ARP-9-4A Rev 43			
Proposed references to be provided to applicants during examination: NONE			
Learning Objective (As available): OPL171.043 ILT OBJ 4			
Question Source:	Bank: Modified Bank: BFN 1205 NRC #90 New:		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis : X		
10 CFR Part 55 Content:	55.41 (b)(3)		

### **QUESTION 42 Rev 3**

Unit 2 is at 100% power, when a failure in the EHC system causes Reactor Pressure to begin to lower. The UO reports the following:

- Generator output lowering
- Main Turbine Bypass Valves opening
- Reactor Pressure is continuing to lower

Based on the above indications and status, what action(s) is(are) required?

- A. Lock out the EHC Pumps.
- B. Close the MSIVs only.
- C. Manually SCRAM the reactor only.
- D. Manually SCRAM the reactor and close the MSIVs.

ANSWER: D



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	223002	G2.1.7
	Importance Rating	4.4	
223002 Primary Containment Isolation System/Nuclear Steam Supply Shut-Off. G2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.			
<p>Explanation: <b>Answer D: Correct-</b> With the reactor at power when pressure gets down to 852 psig a Group 1 (MSIV closure) will occur. The reactor is required to be scrammed and the MSIVs closed if reactor pressure continues to lower to or below 900 psig.</p> <p>A. Incorrect – One of the steps in the Abnormal for EHC is to lockout the EHC Pumps to close the Bypass Valves but this is not appropriate for this case since Reactor Pressure will continue to lower while the EHC accumulators bleed down. Subsequent step if a Group 1 isolation has occurred.</p> <p>B. Incorrect – Closing the MSIVs is required, but a manual scram is also required so this answer is not fully correct.</p> <p>C. Incorrect – A manual scram is required, but closing the MSIVs is also required so this answer is not fully correct.</p>			
Technical Reference(s): 2-AOI-47-2 Rev 15			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.074 V.B.2			
Question Source:		Bank: X	
		Modified Bank:	
		New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(10)	

**QUESTION 43**

Which ONE of the following completes the statement below?

The **LOWEST** MSRV safety function lift setpoint is \_\_ (1) \_\_ psig and at this pressure \_\_ (2) \_\_ MSRVs will lift.

- A. (1) 1135  
(2) 4
- B. (1) 1135  
(2) 5
- C. (1) 1145  
(2) 4
- D. (1) 1145  
(2) 5

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	239002 A3.02	
	Importance Rating	4.3	
239002 A3.02 Ability to monitor automatic operation of the Relief/Safety Valves including: SRV operation on high reactor pressure			
<p>Explanation: <b>CORRECT A:</b> SRV safety (and relief) set points for Units 1, 2, and 3 are as follows: 4 at 1135 psig, 4 at 1145 psig, and 5 at 1155 psig.</p> <p>B - Incorrect – First part Correct. Second part Incorrect plausible since 5 SRVs lift at 1155 psig</p> <p>C - Incorrect – First part Incorrect plausible since this is the next highest safety setpoint. Second part Correct.</p> <p>D - Incorrect – First part Incorrect see C above and second part Incorrect see B above.</p>			
Technical Reference(s): FSAR Chapter 4.4, SRV Prints, OPL171.009 Tech Spec 3.4.3, SR-3.4.3.1			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.009 V.B.3			
Question Source:		Bank: BFN Bank Modified Bank: New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 44    Rev. 3**

Unit 2 is operating at 100% Reactor Power, when a Reactor Coolant leak in the Drywell occurs. The following conditions currently exist:

- ADS BLOWDOWN POWER FAILURE, (2-9-3C, window 32), is in alarm

Emergency Depressurization is required.

- Only 4 ADS Valves opened

Does this number of open ADS Valves meet the minimum number of MSRVs required for Emergency Depressurization?

How many additional MSRVs, if any, are procedurally required be opened?

	<b><u>Min number of SRVs</u></b>	<b><u>Additional MSRVs</u></b>
A.	Yes	Two
B.	Yes	Zero
C.	No	Two
D.	No	Zero

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	239002 K3.03	
	Importance Rating	4.3	
239002 Knowledge of the effect that a loss or malfunction of the Relief/Safety Valves will have on the following: Ability to rapidly depressurize the reactor			
<p>Explanation: <b>CORRECT A:</b> With only 4 SRVs open <u>due to this logic power failure</u> the minimum number of MSRVs required for ED is still met because in accordance with the EOI Program Manual that number is 4. The EOIs want 6 ADS valves open and a step states that if less than six are open then open additional MSRVs until 6 are open.</p> <p style="margin-left: 150px;">C-2</p> <p>B – Incorrect – First part Correct. Second part Incorrect plausible in that the minimum number is met in accordance with the Program manual so no additional MSRVs would have to be opened.</p> <p>C – Incorrect – First part Incorrect plausible in that the EOI says to open 6 ADS Valves but four is the minimum in accordance with the Program Manual. Second part Correct.</p> <p>D – Incorrect – First part Incorrect, plausible in that the EOI says to open 6 ADS Valves but four is the minimum in accordance with the Program Manual, the second part is incorrect but plausible in that the EOI states that if you cannot establish ED Conditions with SRVs then align the Alternate Emergency Depressurization System to augment the ED.</p>			
Technical Reference(s): 2-AOI-1-1, OPL171.043 Rev. 15, 2-ARP-9-3C, 2-C-2			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.043 Rev. 15, ILT L.O. 3			
Question Source:		Bank: Modified Bank: BFN NRC 0801 #89 New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(7)	

### QUESTION 45 Rev 1

Unit 2 is at 85% power and RFPT 2A and 2B are on the Master Level Controller in three element control when the Unit Operator notes the following Reactor Water Level transient:

- RPV water level shows a slow rise above normal

Then the following conditions are noted:

- RFPT 2B speed begins and continues to rise
- RFPT 2A speed begins to lower slowly
- Master Level Controller output is lowering

Which ONE of the following completes the statements below?

The upper speed limit for RFPT governor control will allow is \_\_ (1) \_\_.

The operator action that will correct this condition is to depress \_\_ (2) \_\_ and take manual control.

- A. (1) 5600  
(2) RFPT 2A Speed Control Raise/Lower 2-HS-46-8A
- B. (1) 5600  
(2) RFPT 2B Speed Control Raise/Lower 2-HS-46-9A
- C. (1) 5850  
(2) RFPT 2A Speed Control Raise/Lower 2-HS-46-8A
- D. (1) 5850  
(2) RFPT 2B Speed Control Raise/Lower 2-HS-46-9A

ANSWER: D

RWLC's

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	259002 A2.04	
	Importance Rating	3.0	
259002 A2.04 Ability to (a) predict the impacts of the following on the Reactor Water Level Control System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: <u>RFP runout condition</u> : Plant-specific			
<p>Explanation: <b>CORRECT D:</b> For Unit 2 5850 is the governor limited speed. With water level rising and master controller lowering RFPT 2A is operating normally the correct action would be to take control of RFPT 2B in manual which is rising which is incorrect if the controller were functioning correctly.</p> <p>A – Incorrect – First part Incorrect plausible as this is the upper governor limit for Unit 3 RFPTs. Second part Incorrect plausible this is the other RFPT on line and speed is decreasing but this is the correct response for the given condition.</p> <p>B – Incorrect – First part Incorrect see A above and second part Correct.</p> <p>C – Incorrect – First part Correct and second part Incorrect see A above.</p>			
Technical Reference(s): 2-OI-3 Rev 145, 2-AOI-3-1 Rev 21			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.012 V.B.8			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(10)	

### QUESTION 46 Rev 1

Unit 2 is at 25% Reactor power, when a malfunction occurs in the Reactor Feedwater Level Control system resulting in the Total Feedwater Flow input to the Rod Worth Minimizer (RWM) failing downscale.

The following is displayed on the RWM:

RWM	COMP
PROG	BUFF

- RWM Inoperable due to LPAP/LPSP Inconsistency

Which ONE of the following describes the current operation of the RWM?

- A. Power is above the LPAP, the RWM does NOT enforce any rod blocks.
- B. ONLY a select block will occur and no control rod can be selected.
- C. ONLY a withdraw and insert block are applied, a control rod can be selected.
- D. A select block will occur, also withdraw and insert blocks are applied.

ANSWER: D



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	259002 K3.03	
	Importance Rating	2.7	
Knowledge of the effect that a loss or malfunction of the Reactor Water Level Control System will have on following: Rod worth minimizer: Plant-specific			
<p>Explanation: <b>CORRECT D:</b> The RWM will apply a select block and withdraw and insert blocks due to LPSP/LPAP mismatch</p> <p>A – Incorrect plausible that power is above the LPAP the LPAP is different for each Unit and it is 27% for Unit 2 which comes off Steam Flow.</p> <p>B - Incorrect plausible in that this is partially correct and that only a select block would be applied due to a program abort since once a select block is applied and insert and withdraw block would not be required.</p> <p>C - Incorrect plausible in that this is partially true and that control rods could still be selected and the insert and withdraw blocks would prevent any errors.</p>			
Technical Reference(s): 2-OI-85, OPL171.024			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.024 V.B.11			
Question Source:		Bank:	
		Modified Bank:	
		New:	X
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge:	
		Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(6)	

**QUESTION 47   Rev. 2**

All Three Units are at 100% power.

Drywell venting is in progress on **Unit 2** in accordance with 2-OI-64, Primary Containment System, Section 6.1 Venting the Drywell with Standby Gas Treatment Fan.

**Subsequently, Unit 3 Reactor Scrams on Low Reactor Water Level.**

Which ONE of the following completes the statements below?

On Unit 2 an isolation will occur on the \_\_ (1) \_\_.

Drywell pressure on Unit 2 will \_\_ (2) \_\_.

- A. (1) Refuel Zone ONLY  
(2) continue to lower
- B. (1) Refuel Zone ONLY  
(2) stop lowering
- C. (1) Reactor and Refuel Zone  
(2) continue to lower
- D. (1) Reactor and Refuel Zone  
(2) stop lowering

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	261000 A1.02	
	Importance Rating	3.1	
261000 A1.02 Ability to predict and/or monitor changes in parameters associated with operating Standby Gas Treatment System control including: Primary containment pressure			
<p>Explanation: <b>CORRECT A:</b> A Group 6 isolation on Unit 3 will only cause a Refuel Zone isolation on Unit 1 or 2. The Drywell pressure on Unit 2 will continue lowering because 2-FSV-64-31 and 2-FSV-84-20 which were opened to vent do not isolate from a group 6 signal on Unit 3 see 730E927-16,17A, and 18.</p> <p>B – Incorrect – First part Correct – The Secondary Containment Isolation logic for each Unit has contacts from 1, 2, 3 RLY- 16A-K23 and 24 that are in series in the logic for each Units Refuel Zone Fans, see 45E614-5 and 6. Second part – Incorrect see D below.</p> <p>C – Incorrect – First part Incorrect see D below. Second part correct. Each Unit has its own Inboard and Outboard Secondary Containment isolation logic and 2-FSV-64-31 and 2-FSV-84-20 are powered from the Unit 2 logic which will not lose power from another units PCIS group 6 signal.</p> <p>D – Incorrect – First part Incorrect plausible in that a PCIS group-6 signal will isolate the Reactor and Refuel zone on the Unit that generated the signal. Second part Incorrect plausible in that 2-FSV 64-31 and 2-FSV-84-20 would close if the PCIS group 6 signal was generated on Unit 2, isolating the vent path.</p>			
Technical Reference(s): 2-AOI-64-2D, 2-OI-64, 1-45E614-5and 6, 1-730E927-16, 17A , and 18, 1-45E777-3			
Proposed references to be provided to applicants during examination: none			
Learning Objective (As available): OPL171.017 Rev. 16, ILT L.O. A.2.c, OPL171.018 Rev. 10, LO V.B.12			
Question Source:	Bank: Modified Bank: New:     X		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis :             X		
10 CFR Part 55 Content:	55.41 (b)(7)		

### QUESTION 48

Which ONE of the following completes the statements below?

For Unit 3 one of the qualified offsite circuits from the 500 KV switchyard comes through Unit Station Service Transformer (USST) \_\_ (1) \_\_.

For Unit 3 to meet the Limiting Condition for Operation (LCO) requirement of Technical Specification 3.8.1, \_\_ (2) \_\_ of the qualified offsites circuits are required to be OPERABLE.

- |    |                  |                 |
|----|------------------|-----------------|
| A. | <u>(1)</u><br>3A | <u>(2)</u><br>2 |
| B. | 3A               | 3               |
| C. | 3B               | 2               |
| D. | 3B               | 3               |

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	262001 K2.01	
	Importance Rating	3.3	
262001 AC Electrical Distribution Knowledge of electrical power supplies to the following: Off-site sources of power			
<p>Explanation: <b>CORRECT C:</b> USST 3B provides the one source of qualified offsite circuitry. For Unit 3, two of the three offsite circuits are required IAW TS 3.8.1.</p> <p>A – Incorrect – First part Incorrect plausible in that the other USST is 3A. Second part Correct.</p> <p>B – Incorrect – First part Incorrect see A above. Second part Incorrect plausible in that there are three off-site circuits for U3 but 2 of the 3 are required to be operable.</p> <p>D – Incorrect – First part Correct and second part Incorrect see B above.</p>			
Technical Reference(s): 0-OI-57A Rev 152, TS 3.8.1 Amendment 244			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.036 ILT 6 and 13			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(4)	

**QUESTION 49 Rev 1**

Unit 1 is operating at 100% Reactor Power, when a loss of Unit Preferred power occurs.

The Unit Operator is now ready to re-energize Battery Board 1, Panel 11.

Which ONE of the following completes the statement below?

Upon re-energization of the Unit Preferred Bus, Panel 1-9-9 Cabinet 5 will \_\_ (1) \_\_ transfer to normal power AND Panel 1-9-9 Cabinet 6 will \_\_ (2) \_\_ transfer to normal power.

- A. (1) AUTO  
(2) AUTO
- B. (1) require a MANUAL  
(2) AUTO
- C. (1) AUTO  
(2) require a MANUAL
- D. (1) require a MANUAL  
(2) require a MANUAL

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	262002.A4.01	
	Importance Rating	2.8	
262002 Uninterruptable Power Supply (AC/DC) Ability to manually operate and/or monitor in the control room: Transfer from alternative source to preferred source			
<p>Explanation: CORRECT B: Cabinet 6 Auto transfers back to normal power source while Cabinet 5 must be manually transferred back to its normal power source.</p> <p>A – Incorrect – First part Incorrect plausible because Cabinets 1, 2, 3, and 6 all AUTO transfer only cabinet 4 and 5 must be manually transferred. Second part Correct.</p> <p>C – Incorrect – First par Incorrect see A above. Second part Incorrect plausible because Cabinets 1, 2, 3, and 6 all AUTO transfer only cabinet 4 and 5 must be manually transferred.</p> <p>D – Incorrect – First part Correct and second part Incorrect</p>			
Technical Reference(s): OPL171.102 Rev 7, 1-AOI-57-4 Rev 29			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.102 V.B.2			
Question Source:		Bank: X Modified Bank: New	
Question History:		Previous NRC : None	
Question Cognitive Level:		Memory or Fundamental Knowledge X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b) (4)	

### QUESTION 50

Which ONE of the following completes the statements below?

The normal power supply to 250V Unit Battery Chargers 1, 2A, 2B, and 3 is \_\_ (1) \_\_.

The alternate power supply to 250V Unit Battery Chargers 1, 2A, 2B, and 3 is \_\_ (2) \_\_.

**(1) NORMAL**

**(2) ALTERNATE**

- |    |                      |                     |
|----|----------------------|---------------------|
| A. | 480V Shutdown Boards | 480V Common Board 1 |
| B. | 480V Shutdown Boards | 480V Unit Boards    |
| C. | 480V Common Boards   | 480V Common Board 1 |
| D. | 480V Common Boards   | 480V Unit Boards    |

ANSWER: A



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	263000 K1.01	
	Importance Rating	3.3	
263000 K1.01 Knowledge of the physical connections and/or cause-effect relationship between DC Electrical Distribution and the following: AC electrical distribution			
<p>Explanation: <b>CORRECT A:</b> Normal power supply to Unit Battery Chargers is 480V SD BDs and the alternate power supply is 480V Common BDs.</p> <p>B – Incorrect – First part Correct. Second part Incorrect plausible since these are Unit Battery Chargers and two Unit BDs exist for each Unit, Unit 1 has Unit BDs 1A and 1B, Unit 2 has 2A and 2B and Unit 3 has 3A and 3B.</p> <p>C – Incorrect – First part Incorrect plausible in that the Normal supply to Battery Chargers 5 and 6 is 480V Common Boards 1 and 3. Second part Correct.</p> <p>D – Incorrect – First part Incorrect see C above and second part Incorrect see B above.</p>			
Technical Reference(s): OPL171.037, System Prints			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.037 ILT 2			
Question Source:	Bank:	X	
	Modified Bank:		
	New:		
Question History:	Previous NRC:	None	
Question Cognitive Level:	Memory or Fundamental Knowledge:	X	
	Comprehension or Analysis :		
10 CFR Part 55 Content:	55.41 (b)(4)		

### QUESTION 51

The A Diesel Generator is being untagged following an overhaul.  
The ambient temperature in the A Diesel Generator room is 60° F.

Which ONE of the following completes the statement below?

The A Diesel Generator Lube Oil Temperature will be warmed by an immersion heater  
in the \_\_ (1) \_\_.

For the A Diesel Generator to be in Standby Readiness in accordance with 0-OI-82 the LO CLR  
LUBE OIL OUTLET TEMP 0-TI-82-35A must be greater than \_\_ (2) \_\_ degrees F.

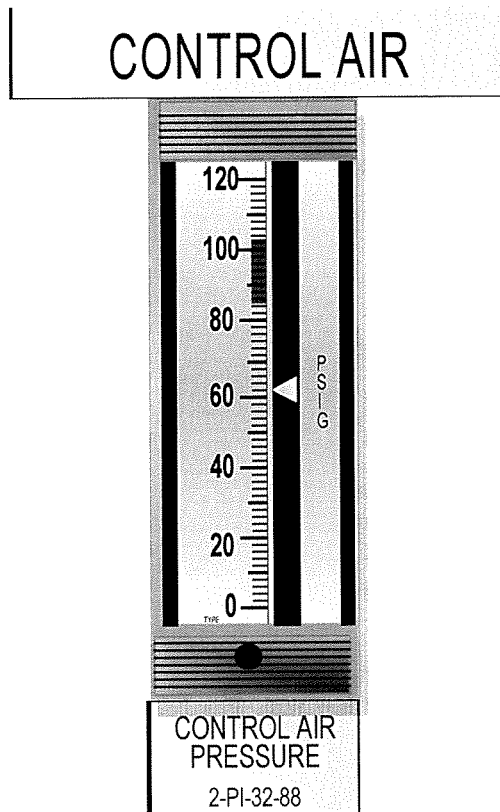
- A. (1) cooling water system  
(2) 85
- B. (1) cooling water system  
(2) 100
- C. (1) soakback oil subsystem  
(2) 85
- D. (1) soakback oil subsystem  
(2) 100

Answer: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	264000 A1.01	
	Importance Rating	3.0	
264000 A1.01 Ability to predict and/or monitor changes in parameters associated with operating the Emergency Generators(Diesel/Jet) controls including: Lube oil temperature			
<p>Explanation: <b>Answer A:</b> Part 1 – The heater is in the cooling water system.  Part 2 – Standby Readiness requires that the LO CLR LUBE OIL OUTLET TEMP 0-TI-82-35A be greater than 85degrees F.</p> <p>B – Incorrect – Part 1– correct  Part 2– incorrect plausible in that the normal range in illustration 2 is 100-190 degrees F.</p> <p>C – Incorrect – Part 1 – incorrect plausible In that in standby, the oil cooler becomes an oil “heater” and the flow from the oil soakback pump is warmed to keep the oil system in standby readiness.  Part 2 – correct see A above</p> <p>D – Incorrect – Part 1 incorrect see C above  Part 2 incorrect see B above</p>			
Technical Reference(s): 0-OI-82; OPL 171.038			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.038 Rev 20 ILT 12&13			
Question Source:		Bank: Modified Bank: New    X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 52 Rev 1**

Unit 2 is at 100% Reactor Power when a Control Air leak results in the following indication:



Based upon the **ABOVE** indication, what impact on plant systems has occurred?

- A. SERVICE AIR XTIE VLV, 0-FCV-33-1, is CLOSED
- B. CONDENSATE DEMIN BYPASS VALVE, 2-FCV-2-130, is OPEN
- C. Unit 2 OUTBOARD MSIV accumulator check valves have OPENED
- D. Unit 2 to Unit 3 CONTROL AIR CROSSTIE, 2-PCV-032-3901, is CLOSED

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	300000 A4.01	
	Importance Rating	2.6	
300000 A4.01 Instrument Air Ability to manually operate and/or monitor in the control room: Pressure Gauges			
<p>Explanation: <b>CORRECT D:</b> Unit 2 to Unit 3 Crosstie Valve 2-PCV-032-3901 closes with Control Air Pressure less than 65 psig and will not re-open until Control Air Pressure is 85 psig.</p> <p>A – Incorrect - SERVICE AIR XTIE VLV 0-FCV-33-1 opens at Control Air System Pressure of 85 psig. Plausible in that this valve has both an automatic opening and automatic closing function associated with degraded Control Air Pressure. Current reading of 62 psig is less than automatic opening set point and greater than the automatic re-closing set point of 30 psig.</p> <p>B – Incorrect - CONDENSATE DEMIN BYPASS VALVE, 2-FCV-2-130 fails open with Control Air Pressure less than 50 psig. Plausible in that this valve will fail open with degraded Control Air Pressure which has not yet been reached.</p> <p>C – Incorrect - Main Steam Isolation Valves close with Control Air System Pressure of 45 psig. Plausible in that the MSIVs will fail closed with degraded Control Air Pressure which has not yet been reached.</p>			
Technical Reference(s): 0-OI-32 Rev 134			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.054 V.B.3			
Question Source:		Bank: 1006 BFN NRC # 52 Modified Bank: New:	
Question History:		Previous NRC: 1006 BFN NRC # 52	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 53 Rev 1**

Which ONE of the following completes the statement below?

A sustained loss of Raw Cooling Water will result in **NO** cooling to the \_\_\_\_\_.

- A. Drywell
- B. Fuel pool
- C. CRD pumps
- D. Control air compressors

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	400000 K3.01	
	Importance Rating	2.9	
400000 K3.01 Component Cooling Water: Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: Loads cooled by CCWS			
<p>Explanation: <b>ANSWER C:</b> The CRD pump speed changer and thrust bearing are cooled by Raw Cooling Water (RCW).</p> <p>A – Incorrect — Plausible because Raw Cooling Water (RCW) normally is the heat sink for RBCCW which provides the cooling medium for the Drywell Blowers. However, if RCW header pressure at the RBCCW HX inlet drops to &lt;15 psig, EECW will provide cooling to one RBCCW heat exchanger per unit.</p> <p>B - Incorrect – Plausible because Raw Cooling Water (RCW) normally is the heat sink for RBCCW which provides the cooling medium for the FPC heat exchangers however, if the RCW header pressure at the RBCCW HX inlet drops to &lt;15 psig, EECW will provide cooling to one RBCCW heat exchanger per unit.</p> <p>D - Incorrect – Plausible in that normal cooling water for the control air compressors is supplied by RCW however, on low RCW header pressure EECW provides backup cooling water.</p>			
Technical Reference(s): OPL171.048 Rev 14, OPL171.047 Rev 12, OPL 171.067 Rev 18;1-OI-24 Rev 54; 1,2,3 OI-70 Rev 54			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.048 V.B.3			
Question Source:		Bank: BFN Modified Bank: New:	
Question History:		Previous NRC: NA	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(4)	

**QUESTION 54 Rev. 2**

A Unit 2 startup is in progress.

- Rod Worth Minimizer (RWM) is **out of service**
- The control rods in groups 13-17 are repeating groups
- All control rods in group 15 are at their withdraw limit (12) except 14-11, 14-43, and 46-27 which are at position 08.
- All control rods in group 16 are at their insert limit (12) except 30-59 which is at position 16.

RWM is then returned to service with Sequence Control **ON**.

Which one of the following completes the statements below?

RWM will latch into Group \_\_\_\_ (1) \_\_\_\_ .

Control rod \_\_\_\_ (2) \_\_\_\_ would have to be moved in accordance with 2-AOI-85-7, Mispositioned Control Rod.

- A. (1) 15  
(2) 30-59
- B. (1) 15  
(2) 46-27
- C. (1) 16  
(2) 30-59
- D. (1) 16  
(2) 46-27

ANSWER: A



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	201006 A2.05	
	Importance Rating	3.1	
201006 A2.05 Rod Worth Minimizer Ability to (a) predict the impacts of the following on the Rod Worth Minimizer System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Out of sequence rod movement; Plant-specific			
<p>Explanation: <b>CORRECT A:</b> The RWM will latch to the highest group in the sequence with at least one control rod withdrawn past the group insert limit and no other groups below have three insert errors therefore group 15 would be latched. RWM would force a withdraw error (30-59) to be corrected. IAW with 2-AOI-85-7, if a control rod is less than or equal to 2 notches from the intended position, the control is moved with RE recommendation and US permission.</p> <p>B – Incorrect – First part Correct, see above. Second part Incorrect plausible if it is thought that insert errors must be corrected first.</p> <p>C – Incorrect - First part Incorrect plausible if it thought that RWM would latch into the highest group with a control rod withdrawn above the insert limit. Second part Correct.</p> <p>D – Incorrect - First part Incorrect, see C above. Second part Incorrect plausible, see B above.</p>			
Technical Reference(s): 2-OI-85 Rev 139, 2-AOI-85-7 Rev 22			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.024 Rev. 14, L.O. V.B.10 and 12			
Question Source:		Bank:	
		Modified Bank:	
		New:	X
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis X	
10 CFR Part 55 Content: 55.41 (b)(6)			

**QUESTION 55 Rev 2**

Unit 3 is at 100% power with a Rod Line of 110%

- Core Flow is 87.1 MLB/HR

Subsequently A manual Recirc pump runback is inserted.

- Core Flow lowers to 62.1 MLB/HR

Which ONE of the following completes the statements below?

The \_\_ (1) \_\_ Power Runback was inserted.

Following completion of the manual runback:

The RECIRC MASTER CONTROL LOWER MEDIUM push button 3-HS-96-34 is depressed one time by the OATC and Recirc Pump 3A and 3B speed \_\_ (2) \_\_.

- A. (1) Mid  
(2) lower 5 rpm at 5 rpm per second
- B. (1) Mid  
(2) lower 5 rpm at 1 rpm per second
- C. (1) Upper  
(2) lower 5 rpm at 5 rpm per second
- D. (1) Upper  
(2) lower 5 rpm at 1 rpm per second

Answer: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	202002 A1.07	
	Importance Rating	3.1	
202002 A1.07 Ability to predict and/or monitor changes in parameters associated with operating the Recirculation Flow Control System controls including: Recirculation loop flow: Plant-specific			
<p>Explanation: <b>Answer B:</b> Part 1– Mid power runback will take power to 78.5% steam flow which based on initial conditions equates to approximately 62 mlbm/hr. Part 2 – According to 3-OI-68 depressing the master controller lower medium push button one time results in lowering the Recirc pump speeds 5 rpm at 1 rpm per second.</p> <p>A – Incorrect – First part Correct. Second part Incorrect plausible in that the lowering 5 rpm is correct but the rate of speed change is not correct.</p> <p>C – Incorrect – First part Incorrect plausible in that this is one of the three runbacks and an upper power runback will reduce steam flow to 90% steam flow. Second part Incorrect see A above.</p> <p>D – Incorrect – First part Incorrect see C above and second part Correct.</p>			
Technical Reference(s): 3-OI-68 Rev 87			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.007A Rev 6 ILT 6			
Question Source:		Bank:	
		Modified Bank:	
		New	X
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge	
		Comprehension or Analysis: X	
10 CFR Part 55 Content:		55.41 (b)(2)	

**QUESTION 56 Rev 1**

Which ONE of the following completes the statements below?

It is preferred that the Reactor Engineer obtain TIP trace data using \_\_ (1) \_\_.  
TIP trace data is used to directly calibrate the \_\_ (2) \_\_.

- A. (1) the ICS computer  
(2) APRMs
- B. (1) PEDS  
(2) LPRMs
- C. (1) the ICS computer  
(2) LPRMs
- D. (1) PEDS  
(2) APRMs

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	215001 K1.02	
	Importance Rating	2.5	
Knowledge of the physical connections and/or cause effect relationships between Traversing In-Core Probe and the following: Process computer			
<p>Explanation: <b>CORRECT C:</b> The Reactor Engineer obtains TIP trace data from the ICS computer. That trace data is used to calibrate the individual LPRMs.</p> <p>A. Incorrect – The first part is correct, the second part is incorrect Plausible in that the TIP data is used to calibrate the LPRMs which input to the APRMs.</p> <p>B. Incorrect – The first part is incorrect, Plausible in that PEDs is a subset of data available from the ICS computer used by OPS and Engineering to monitor system performance. The second part is correct.</p> <p>D. Incorrect – The first part is incorrect, see B above. The second part is incorrect see A above.</p>			
Technical Reference(s): 1, 2, 3-OI-94 Revs 18, 36, 23			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.023 V.B.7			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(2)	

**QUESTION 57 Rev. 2**

Unit 2 is starting up and is currently at 12% power.

During a panel walkdown the operator notices the indication that is on the attached illustration. All other lights above the Drywell Vacuum Relief Valve Test switches are as expected.

Which ONE of the following completes the statements below?

A Technical Specification LCO \_\_ (1) \_\_ required.

The condition of Drywell Vacuum Relief Valve M will allow \_\_ (2) \_\_ should a LOCA occur.

**Illustration Attached**

- A. (1) is NOT  
(2) excessive bypass leakage
- B. (1) is NOT  
(2) drywell pressure to lower such that external design pressure is reached
- C. (1) is  
(2) excessive bypass leakage
- D. (1) is  
(2) drywell pressure to lower such that external design pressure is reached

ANSWER C

**DRYWELL VACUUM RELIEF  
VALVE**



**2-ZI-64-28AA**



**2-ZI-64-28BA**



**2-ZI-64-28CA**



**2-ZI-64-28DA**



**2-ZI-64-28EA**



**2-ZI-64-28FA**



**2-ZI-64-28GA**



**2-ZI-64-28HA**



**2-ZI-64-28JA**



**2-ZI-64-28KA**



**2-ZI-64-28LA**



**2-ZI-64-28MA**

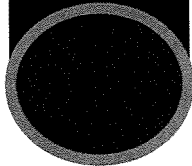
**ALL LIGHTS ARE SHOWN LIT  
EXCEPT 2-ZI-64-28MA IT IS EXTINGUISHED**



**DRYWELL VACUUM  
RELIEF VALVE M TEST**

**PANEL 2-9-9, BKR 304 | 2-HS-64-28M**

**TEST**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	223001 K6.09	
	Importance Rating	3.4	
223001 K6.09 Knowledge of the effect that a loss or malfunction of the following will have on the Primary Containment System and Auxiliaries: Drywell vacuum relief system			
<p>Explanation: <b>CORRECT C:</b> With a Drywell Vacuum Relief Valve partially OPEN (greater than 3 degrees), a TS required action is required to be entered. Two inoperable valves are allowed but NO valves can be open. TS Bases states that with valve open the result is excessive bypass leakage during a LOCA which will lead to DW over-pressurization.</p> <p>A – Incorrect – First part Incorrect plausible in that you are allowed two inoperable vacuum breakers and ONE can be open up to 3 degrees, but the RED light indicates that it is open more than 3 degrees thus the Tech. Spec. is NOT met and an action is required. Second part Correct.</p> <p>B – First part Incorrect see A above and second part Incorrect see D below.</p> <p>D – Incorrect – First part Correct. Second part Incorrect plausible as this is what will occur if the Drywell Vacuum relief valves do NOT open (fail closed) should a LOCA occur.</p>			
Technical Reference(s): 2-SR-3.6.1.6.3			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.016 Rev. 19, ILT L.O. 6 and 12			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41 (b)(7)	



**QUESTION 58    Rev 1**

Given the following conditions for Unit 2:

- RPV Level is (-) 75 inches
- Reactor Pressure is 580 psig
- Drywell Pressure is 10 psig
- Suppression Chamber Pressure is 11 psig
- Drywell Temperature is 265 °F
- The Unit Supervisor has directed Loop I of RHR be placed in Drywell Sprays in accordance with 2-EOI Appendix-17B, RHR System Operation Drywell Sprays.
- See Attached Illustration for current CTMT SPRAY/CLG VALVE Control switch positions and indication

Which ONE of the following completes the statements below based on the indications shown on Attached Illustration?

A LPCI initiation signal \_\_ (1) \_\_ present on Unit 2.

When 2-HS-74-60A, RHR SYS I DW SPRAY OUTBD VLV and 2-HS-74-61A, RHR SYS I DW SPRAY INBD VLV are placed in OPEN, Drywell temperature will \_\_ (2) \_\_.

**Illustration Attached**

- A. (1) is  
    (2) lower
- B. (1) is  
    (2) remain the same
- C. (1) is NOT  
    (2) lower
- D. (1) is NOT  
    (2) remain the same

ANSWER: D

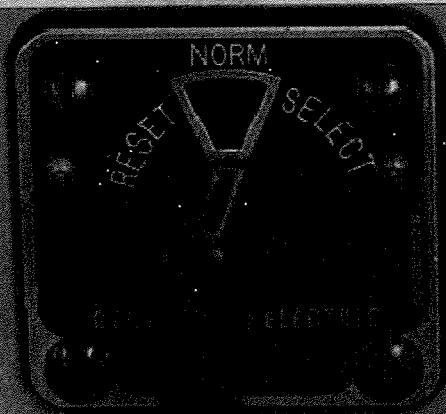
2-XS-74-121  
IN SELECT  
2-IL-74-121



2-XS-74-122  
IN OVERRIDE  
2-IL-74-122



RHR SYS I CTMT  
SPRAY/CLG VLV SELECT  
2-XS-74-121



RHR SYS I LPCI  
2/3 CORE HEIGHT OVRD  
2-XS-74-122



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	226001 K3.02	
	Importance Rating	3.5	
226001 K3.02 Knowledge of the effect that a loss or malfunction of the RHR/LPCI: Containment Spray System Mode will have on the following: Containment/Drywell/suppression chamber temperature			
<p>Explanation: <b>CORRECT D:</b> LPCI initiation signal is not present, must be RPV level &lt;-122" OR 2.45psig in the drywell WITH RPV press &lt;450psig. Drywell Temperature will remain the same because the 2/3 core height bypass must be in manual override to bypass the LPCI initiation signal prereq, the current switch lineup is correct for spraying the drywell but with the lights OFF the LOGIC is NOT made up and thus Drywell sprays on this Loop will NOT function.</p> <p>A – Incorrect – First part Incorrect A LPCI signal is present is plausible because Drywell pressure is &gt;2.45 psig and reactor level is &lt;level 2 (- 45 inches) in addition 530 psig is less than 540 psig which could be confused with 450 psig. Second part Incorrect that drywell pressure would lower is plausible since the select switch is in select, given that the RPV level is &gt; 2/3 core height it is plausible to think that failure to place the 2/3 core height switch in manual override would have no effect. Since the select switch bypasses the inline valve interlock when ALL of the following exist :&gt;2/3 core height, LPCI signal present, and the select switch in select.</p> <p>B – Incorrect – First part Incorrect see A above and second part Correct.</p> <p>C – Incorrect – First part Correct and second part Incorrect see A above.</p>			
Technical Reference(s): 2-OI-74 Rev 169, Simulator, RHR Prints			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.044 ILT 4.g			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 59    Rev 2**

The Unit 3 Board Operator is directed to place Div 1 RHR in Torus Spray mode.

He subsequently starts both Div 1 RHR pumps.

What are the electrical power supplies to the running RHR Pump(s)?

- A. 4KV Shutdown Boards 3EA and 3ED
- B. 4KV Shutdown Boards 3EA and 3EC
- C. 4KV Shutdown Boards 3EB and 3EC
- D. 4KV Shutdown Boards 3EA and 3EB

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	230000 2.02	
	Importance Rating	2.8	
230000 RHR/LPCI: Torus/Suppression Pool Spray Mode K2.02 Knowledge of the electrical power supplies to the following: Pumps			
<p>Explanation: <b>CORRECT D:</b> RHR Pumps in Div I (3A and 3C) power supplies are 4KV S/D Buses 3EA and 3EB.</p> <p>A. Incorrect – Partially correct in that 3EA is the power supply for 3A pump but 3EB is the power supply for 3C pump not 3ED.</p> <p>B. Incorrect – Since the power supply for the RHR Pump 3A is Shutdown Buses 3EA and the power supply for the 3C Pump is Shutdown Bus 3EB. Not 3EC, which would match the pump number.</p> <p>C. Incorrect – 3EC is incomplete and the other power supply is not 3EC which matches the pump number.</p>			
Technical Reference(s): 2,3-OI-74, Lesson Plan OPL171.044 Rev 18.			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL.171.044 ILT 3c			
Question Source:		Bank: X Modified Bank: New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(7)	

### QUESTION 60 Rev. 1

Given the following conditions for Unit 3:

- The Reactor is at 100% power
- The Spent Fuel Pool temperature is 80 °F
- Irradiated fuel is in the fuel pool
- Fuel Pool Cooling Pump '3A' is tagged out

**Subsequently**, '3B' Fuel Pool Cooling Pump trips, due to an electrical fault.

Which ONE of the following completes the statement below?

Fuel Pooling Cooling System Temperature is indicated on Panel \_\_\_\_ (1) \_\_\_\_ and is \_\_\_\_ (2) \_\_\_\_ , under this condition.

- A. (1) 3-9-4  
(2) accurate
- B. (1) 3-9-4  
(2) inaccurate
- C. (1) 3-9-21  
(2) accurate
- D. (1) 3-9-21  
(2) inaccurate

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	233000 A4.05	
	Importance Rating	2.7	
233000 A4.05 FPCC System Ability to operate and/or monitor in the control room: Pool temperature			
<p>Explanation: <b>CORRECT D:</b> (Caution Note) Loss of the Fuel Pool Cooling System will cause Fuel Pool Cooling System inputs on 3-TR-74-80 to be inaccurate until Fuel Pool Cooling Flow is reestablished. 3-TR-74-80 is located on back panel 9-21.</p> <p>A - Incorrect - First part Incorrect but plausible since Fuel Pooling Cooling System is controlled from Panel 9-4 in the MCR. Second part Incorrect but plausible if it is believed system flow isn't required for an accurate temperature measurement.</p> <p>B - Incorrect - First part Incorrect, see A above. Second part Correct.</p> <p>C - Incorrect - First part Correct. Second part Incorrect, see A above.</p>			
Technical Reference(s): 3-AOI-78-1 Rev 22			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.052 Rev. 11, ILT L.O. A.7.a			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(5)	

**QUESTION 61     Rev 1**

Which ONE of the following completes the statements below?

The Main Steam System uses flow restrictors \_\_ (1) \_\_ of the Main Steam Relief Valves (MSRVs) to provide Main Steam Line flow measurement.

The setpoint for a Group One isolation on Main Steam Line High Flow is \_\_ (2) \_\_.

- A. (1) downstream  
    (2) 135%
- B. (1) downstream  
    (2) 200%
- C. (1) upstream  
    (2) 135%
- D. (1) upstream  
    (2) 200%

ANSWER: A



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	239001 K4.05	
	Importance Rating	3.1	
239001 K4.05 Knowledge of Main and Reheat Steam System design feature(s) and/or interlocks which provide for the following: Steam flow measurement			
<p>Explanation: <b>CORRECT A:</b> MSL flow restrictors are upstream of the MSIVs. A group 1 isolation will first occur at a MSL high flow of 135%.</p> <p>B – Incorrect – First part Correct. Second Part Incorrect 200% is plausible because the flow restrictors are sized to limit MSL to &lt;200% in the event of a MSL break.</p> <p>C – Incorrect – First part Incorrect MSL flow restrictors being located downstream of the MSRVs is plausible because MSLs do have orifices downstream of the MSIVs (drain path to main condenser). In addition they are downstream of the MSRVs. Second part Correct.</p> <p>D – Incorrect – First part Incorrect see C above and second part Incorrect see B above.</p>			
Technical Reference(s): 1,2,3-ARP-9-5B; FSAR Chapter 4.5; DWG #1,2,3-47E801-1			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.009 V.B.7			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(3)	

**QUESTION 62    Rev. 1**

Which ONE of the following completes the statement below?

When a Condensate Booster Pump control switch is placed in START, the Auxiliary Oil Pump will start immediately and the pump motor breaker will close in fifteen seconds IF oil pressure is \_\_\_\_ (1) \_\_\_\_ for UNIT 2 and \_\_\_\_ (2) \_\_\_\_ for UNIT 3.

- A. (1) 8 psig  
    (2) 8 psig
- B. (1) 8 psig  
    (2) 20 psig
- C. (1) 20 psig  
    (2) 8 psig
- D. (1) 20 psig  
    (2) 20 psig

Answer: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	256000 G2.2.4	
	Importance Rating	3.6	
256000 Reactor Condensate (multi-unit license) Ability to explain the variations in control room /control room layouts, system, instrumentation, and procedural actions between units at a facility.			
<p>Explanation: CORRECT C: For Unit 1 and Unit 2, the Condensate Booster Pump breaker will close 15 seconds after oil pressure is 20 psig. Unit 3 CBP breaker will close 15 seconds after oil pressure is 8 psig.</p> <p>A - Incorrect - First part Incorrect plausible as 8 psig is correct for Unit 3 and it is believed that Units 2 and 3 are the same.</p> <p>B - Incorrect - First part Incorrect plausible, see A above. Second part Incorrect plausible, as 20 psig is correct for Units 1 and 2.</p> <p>D - Incorrect - First part Correct. Second part Incorrect, see B above.</p>			
Technical Reference(s): 1,2,3-OI-2 Revs 28,98,55			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.011 Rev. 15, ILT L.O. 6			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(4)	

### QUESTION 63 Rev 3

Unit 1, 2, and 3 are operating at 100% power.

The following two Off-gas Post Treatment Radiation Monitors fail as indicated below:

- 2-RM-90-265A, downscale.
- 2-RM-90-266A, upscale.

Which one of the following completes the statements below?

The U2 Off-Gas System Isolation Valve, 2-FCV-66-28 will \_\_ (1) \_\_ and the Off-site release rate during the next 30 minutes will \_\_ (2) \_\_.

- A. (1) close  
(2) lower
- B. (1) close  
(2) remain the same
- C. (1) remain open  
(2) lower
- D. (1) remain open  
(2) remain the same

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	271000 K3.02	
	Importance Rating	3.3	
271000 K3.02 Knowledge of the effect that a loss or malfunction of the Offgas System will have on following: Off-site radioactive release rate			
<p>Explanation: <b>CORRECT A:</b> Part 1– Downscale, Hi-Hi-Hi or INOP on 2-RM-90-265A AND Downscale, Hi-Hi-Hi or INOP on 2-RM-90-266A will automatically isolate the Off-Gas system after a 5 second time delay. Part 2 – When 2-FCV-66-28 closes it isolates the U2 off-gas stream to the stack and the amount of radioactive release out of the stack will lower by the number of Curies that was in the U2 off-gas stream.</p> <p>B. Incorrect – Part 1 – correct Part 2 – incorrect – plausible that 2-FCV-66-28 could isolate the off-gas stream entering the 6 hour holdup volume (the location of the post treatment rad monitors) allowing what was already in the holdup volume to be released causing the release rate not to change in the next 30 minutes.</p> <p>C. Incorrect – Part 1 – incorrect Plausible that the logic would require both Rad Monitors to reach the Hi-Hi-Hi setpoint to close 2-FCV-66-28. Part 2 – correct however it is plausible that this could be selected based on the off-gas system realigning to place the charcoal beds in service if 2-HS-66-113 is in AUTO when 2-RM-90-266A failed upscale. 2-HS-66-113 is normally in treat at 100% power so the charcoal beds would already be in service.</p> <p>D. Incorrect – Part 1– Incorrect– see C above Part 2 – Incorrect see B above</p>			
Technical Reference(s): OPL171.033Rev 14; OPL171.030Rev 18; 2-OI-90			
Proposed references to be provided to applicants during examination: none			
Learning Objective (As available): OPL171.033 V.B.3.b ; OPL171.030 V.B.2,3,and 6			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis : X	
10 CFR Part 55 Content:		55.41 (b)(11)	

**QUESTION 64 Rev 1**

Which ONE of the following completes the statement below?

The use of the Burnable Poison \_\_ (1) \_\_ in some of the fuel rods improves core flux shaping and allows using a higher enrichment of \_\_ (2) \_\_ to extend core life.

- A. (1) Boron Carbide ( $B_4C$ )  
(2) Uranium ( $U_{235}$ )
- B. (1) Boron Carbide ( $B_4C$ )  
(2) Uranium ( $U_{238}$ )
- C. (1) Gadolinium ( $Gd_2O_3$ )  
(2) Uranium ( $U_{235}$ )
- D. (1) Gadolinium ( $Gd_2O_3$ )  
(2) Uranium ( $U_{238}$ )

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	290002 K5.03	
	Importance Rating	2.7	
295002 K5.03 Knowledge of the operational implications of the following concepts as they apply to Reactor Vessel Internals: Burnable poisons			
<p>Explanation: <b>Answer C:</b> Gadolinium is loaded in selected rods as a Burnable poison which allows loading of a larger mass of fissionable material without having to place more control rods in the core and allows better core flux shaping. Without gadolinium in the fuel, the maximum fuel enrichment that could be used, and meet the design requirement, is about 2.3 weight percent (wt %) of U235. With gadolinium as a burnable poison, enrichments higher than 3.0 wt% of U235 can be used. Use of higher enrichments typically 3.8 to 4.24 wt% of U235 allow reload cores to be designed for 24 month refueling intervals.</p> <p>A – Incorrect - part (1) Incorrect- Plausible in that Boron Carbide is a poison and is used in the control rods. Part (2) Correct</p> <p>B – Incorrect - part (1) Incorrect see A above part (2) –incorrect- Plausible in that U<sub>238</sub> is a naturally occurring isotope of Uranium.</p> <p>D – Incorrect – part (1) correct part (2) Incorrect see B above</p>			
Technical Reference(s): OPL171.004 Rev 12 and OPL 171.006 Rev 10			
Proposed references to be provided to applicants during examination: none			
Learning Objective (As available): OPL171.004 Rev 12 ILT objective 6			
Question Source:		Bank:	
		Modified Bank:	
		New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X	
		Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(1)	

**QUESTION 65    Rev 2**

Given the following plant conditions:

- CONT RM ISOL RAD MONITOR DNSCL OR INOP, (Panel 9-6B window 10) is in alarm
- 0-RM-90-259A, CREVs Rad Mon is reading 230 cpm above background
- 0-RM-90-259B, CREVs Rad Mon, is reading downscale

Which ONE of the following describes the Control Room Emergency Ventilation (CREV) System response?

- A. BOTH CREV units will automatically start.
- B. The Selected CREV unit will automatically start after the inlet damper is full open.
- C. The Selected CREV unit will automatically start and then the inlet damper will full open
- D. NEITHER CREV unit will automatically start under these conditions.

Answer: B



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	290003 A3.01	
	Importance Rating	3.1	
290003 Ability to monitor automatic operations of the CONTROL ROOM HVAC including: A3.01 Initiation/reconfiguration			
<p>Explanation: <b>CORRECT B</b> – The Control Room Emergency Ventilation (CREV) system automatically starts on a DOWNSCALE signal in Reactor OR Refuel Zone ONLY. For downscale need one from 142 and one from 143. The selected CREV train will AUTO start when the inlet damper is full open</p> <p>A – Incorrect - This is plausible because one downscale in each channel of the Reactor Zone radiation monitoring system will cause a trip of Reactor Zone and a CREV start. In this case however, there is a radiation monitor downscale in Channel <u>A</u> of the <u>Reactor Zone</u> Rad monitoring system and in Channel <u>B</u> of the <u>Control Room</u> radiation monitoring system. Additionally both CREV units will not start on an initiation signal.</p> <p>C – Incorrect - This is plausible because one downscale in each channel of the Reactor Zone radiation monitoring system will cause a CREV initiation but the CREV will start after the inlet damper opens.</p> <p>D – Incorrect - This is plausible because a downscale of one CREV cam will NOT auto start the CREV and if the downscales were aligned differently for the Reactor Zone Monitors CREV would NOT auto start.</p>			
Technical Reference(s): ARP 9-6B Rev 15, 0-OI-31 Rev 143, OI-90 Rev 65, OPL171.067 Rev 18			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.067 V.B.2.e			
Question Source:		Bank: X Modified Bank: New	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis X	
10 CFR Part 55 Content:		55.41 (b)(7)	

**QUESTION 66 Rev 1**

Concerning the Safety Parameter Display System (SPDS) component of the Integrated Computer System (ICS).

May the Operators use it exclusively to provide information and data to make operational judgments, why or why not?

- A. Yes, it is just one way of displaying the qualified instrumentation's data or information.
- B. Yes, it is qualified instrumentation that provides data and information that may be used to make operational judgments.
- C. No, even though it is considered qualified instrumentation; plant instruments are to be checked to back up any information shown by the SPDS before any actual plant manipulations are performed.
- D. No, it is a highly reliable operator's aid. Installed, qualified plant instruments are to be checked to back up any information shown by the SPDS before any actual plant manipulations are performed.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.1.19	
	Importance Rating	3.9	
G2.1.19 Ability to use plant computers to evaluate system or component status.			
<p>Explanation: <b>CORRECT D:</b> The information contained in "Integrated Computer System 0-OI-48" PRECAUTIONS AND LIMITATIONS states: A. The Safety Parameter Display System (SPDS) component of the Integrated Computer System (ICS) is <b>NOT</b> qualified instrumentation, and therefore cannot be used as the sole guide in operating the plant. It is a highly reliable operator's aid. Installed, qualified plant instruments are to be checked to back up any information shown by the SPDS before any actual plant manipulations are performed.</p> <p>A. Incorrect – Since the displays are using data and info from qualified instruments, the "qualification" has not been performed on SPDS. Even though some info and data is used, such as Thermal Heat Balance info and LPRM Calibration data to control reactivity and make adjustment to reactor power.</p> <p>B. Incorrect – Since the displays are using data and info from qualified instruments, the "qualification" has not been performed on SPDS. Even though some info and data is used, such as Thermal Heat Balance info and LPRM Calibration data to control reactivity and make adjustment to reactor power.</p> <p>C. Incorrect – Since the displays are using data and info from qualified instruments, the "qualification" has not been performed on SPDS. Even though some info and data is used, such as Thermal Heat Balance info and LPRM Calibration data to control reactivity and make adjustment to reactor power.</p>			
Technical Reference(s): 0-OI-48 Rev 46			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.099 ILT 3			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content: 55.41 (b)(10)			

**QUESTION 67   Rev 1**

Which ONE of the following completes the statements below in accordance with OPDP-1, Conduct of Operations?

The STA shall be relieved of all non-STA duties and assume the STA advisory role within \_\_ (1) \_\_ minutes following entry into an \_\_ (2) \_\_.

- A. (1) fifteen minutes  
    (2) EOI only
- B. (1) fifteen minutes  
    (2) AOI or EOI
- C. (1) ten minutes  
    (2) EOI only
- D. (1) ten minutes  
    (2) AOI or EOI

Answer: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.1.6	
	Importance Rating	3.8	
G2.1.6 Ability to manage the control room crew during plant transients.			
<p>Explanation: <b>Answer D:</b> The STA function may be fulfilled by manning a separate STA position or by a qualified individual assigned to another shift position. This individual shall be relieved of all non-STA duties and assume the STA advisory role within ten minutes following entry into an Abnormal or Emergency Operating Instruction, on any unit, as required by the instruction.</p> <p>A – Incorrect – First part Incorrect plausible in that 15 minutes is a time limit for actions in the REP. Second part Incorrect – plausible in that some AOIs may not seem to require an advisory role.</p> <p>B – Incorrect – First part Incorrect see A above, second part – Correct.</p> <p>C – Incorrect – First part Correct , second part – Incorrect see A above.</p>			
Technical Reference(s): OPDP-1 Rev 33			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.071 Rev 15 OBJ 16			
Question Source:		Bank: Modified Bank: New:     X	
Question History:		Previous NRC:	
Question Cognitive Level:		Memory or Fundamental Knowledge   X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(10)	

**QUESTION 68 Rev 1**

In accordance with NPG-SPP-07.3.4, Protected Equipment, which ONE of the following completes the statements below, concerning work ON or NEAR protected equipment while at power?

If the Shift Manager is unavailable, access for work on or near protected equipment is granted by the \_\_\_\_ .

- A. Unit Operator
- B. Unit Supervisor
- C. Work Week Manager
- D. Work Group Supervisor

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.2.17	
	Importance Rating	2.6	
G2.2.17 Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission operator.			
<p>Explanation: <b>CORRECT B:</b> Only the SM or designee can grant access for work near protected equipment while online. The person that is designated is the Unit Supervisor whenever the Shift Manager is unavailable.</p> <p>A. Incorrect – Unit Operator are not designated for granting access near protected equipment while online. This is plausible because they often grant access to non-posted areas where work is being conducted.</p> <p>C. Incorrect – The Work Week Manager is plausible, since the Work Week Manager is responsible for the online maintenance conducted within his assigned week.</p> <p>D. Incorrect – The Work Group Supervisor is plausible, since they are required to provide periodic oversight of the activity.</p>			
Technical Reference(s): BFN-ODM-4.7 Rev 4, NPG-SPP-07.3.4 Rev 1			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available):			
Question Source:		Bank: Clinton Bank Modified Bank: New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(10)	

**QUESTION 69 Rev 1**

Unit 1 Plant Startup is in progress in accordance with 1-GOI-100-1A, Unit Startup.

When is control rod withdrawal limited to single notch withdrawal and when may it be discontinued?

- A. When the fourth SRM count rate doubling is reached and when the IRMs are on Range 7.
- B. When the fifth SRM count rate doubling is reached and when the IRMs are on Range 7.
- C. When the fourth SRM count rate doubling is reached and when the IRM/APRM overlap is verified.
- D. When the fifth SRM count rate doubling is reached and when the IRM/APRM overlap is verified.

ANSWER: A



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.2.2	
	Importance Rating	4.6	
Ability to manipulate console controls as required to operate the facility between shutdown and designated power levels.			
<p>Explanation: <b>CORRECT A:</b> In accordance with 1-GOI-100-1A, A review of startup data has revealed that when count rate doubles five times, criticality is imminent. As an added precaution, the fourth count rate doubling has been chosen as a starting point to limit rod withdrawal to single notch movement. In accordance with 1-GOI-100-1A, once required, Control rod withdrawal is limited to single-notch withdrawal until Reactor power is in the heating range (IRM Range 7).</p> <p>B – Incorrect – First part Incorrect plausible in that Calculations have shown that when the initial SRM count rate has doubled 5 times that the reactor is very near criticality. Second part correct.</p> <p>C – Incorrect – First part Correct. Second part Incorrect plausible in that the next 1-GOI-100-1A step referencing the IRMs is to verify IRM/APRM overlap by operator visual observation at approximately 5% power.</p> <p>D – Incorrect – First part Incorrect see B above and second part Incorrect plausible in that the next 1-GOI-100-1A step referencing the IRMs is to verify IRM/APRM overlap by operator visual observation at approximately 5% power.</p>			
Technical Reference(s): 1-GOI-100-1A Rev 40			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.059 V.B.3 and 4			
Question Source:		Bank: BFN NRC 1102 #69 Modified Bank: New:	
Question History:		Previous NRC: BFN NRC 1102 #69	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis:	
10 CFR Part 55 Content:		55.41 (b)(5)	

## QUESTION 70 Rev 1

Concerning a System's Technical Specification completion times, what are the rules for "once per" completion times?

### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Perform SR 3.x.x.x.	<b><u>Once per</u></b> 8 hours
	<u>OR</u> A.2 Place channel in trip.	8 hours

The "**Once per**" completion time...

- A. qualifies for the 25% extension, per SR 3.0.2, to each performance after the initial performance of the action.
- B. qualifies for the 25% extension, per SR 3.0.2, to each performance including the initial performance of the action.
- C. qualifies for the 25% extension, per SR 3.0.2, to only the initial performance; all remaining must be performed within the specified completion times.
- D. does not qualify for the 25% extension, per SR 3.0.2, each performance of the action must be performed within the specified completion time.

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.2.40	
	Importance Rating	3.4	
Ability to apply Technical Specifications for a system.			
<p>Explanation: <b>CORRECT A:</b> In accordance with T.S. EXAMPLES; EXAMPLE 1.3-6 Required Action A.1 or A.2. Required Action A.1 has a "once per" Completion Time, which qualifies for the 25% extension, per SR 3.0.2, to each performance after the initial performance.</p> <p>B. Incorrect - The initial performance of the action is required to be performed within the specified completion time, however subsequent completion times may be extended by 25%.</p> <p>C. Incorrect - The extension of 25% on completion times is granted following the initial performance of the action.</p> <p>D. Incorrect - The extension of 25% on completion times is granted following the initial performance of the action.</p>			
Technical Reference(s): TS Section 1 Examples Amendment 253			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.087 ILT 12			
Question Source:	Bank: Modified Bank: New: X		
Question History:	Previous NRC: None		
Question Cognitive Level:	Memory or Fundamental Knowledge: X Comprehension or Analysis		
10 CFR Part 55 Content:	55.41 (b)(10)		

**QUESTION 71    Rev. 1**

Given the following conditions:

- A Liquid Effluent Discharge is in progress in accordance with 0-SI-4.8.A.1-1, Liquid Effluent Permit.
- Discharge is going to Unit 3 CCW
- RADWASTE EFFL RADIATION MONITOR DOWNSCALE, (3-9-3A, window 23) alarms

Which ONE of the following completes the statement below?

Contact the \_\_ (1) \_\_ operator to \_\_ (2) \_\_ 0-FCV-77-58A/B, RADWASTE LOW/HIGH FLOW RATE DISCHARGE ISOLATION VALVES.

- A. (1) Radwaste  
    (2) verify the automatic closure of
- B. (1) Radwaste  
    (2) manually isolate
- C. (1) Unit 2  
    (2) verify the automatic closure of
- D. (1) Unit 2  
    (2) manually isolate

Answer A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.3.11	
	Importance Rating	3.8	
Ability to control radiation releases.			
<p>Explanation: <b>CORRECT A:</b> Radwaste operator can verify the automatic isolation of the Radwaste Discharge Isolation Valves on a Downscale signal which cause the alarm on all three units.</p> <p>B – Incorrect – First part Correct. Second part Incorrect plausible in that a HI-HI radiation signal will isolate and that the downscale alarm from the monitor would not isolate.</p> <p>C – Incorrect – First part Incorrect plausible in that both Unit 2 and 3 are told to contact the Unit 1 operator and Radwaste. The Unit 1 operator has indications on Panel 1-9-10 which Unit 2 and 3 do not have. Second part Correct.</p> <p>D – Incorrect – First part Incorrect see C above and second part Incorrect see B above.</p>			
Technical Reference(s): ARP-9-3A Rev 42, 0-SI-4.8.A.1-1 Rev 84			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.084 Rev. 8, L.O. B.6, OPL171.033 Rev. 14, ILT L.O. V.B.4.b			
Question Source:		Bank: X Modified Bank: New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: Comprehension or Analysis     X	
10 CFR Part 55 Content:		55.41 (b)(11)	

**QUESTION 72 Rev 2**

All three units are operating at 100% power.

What actions are **required** to be performed by the Unit Operator upon receiving ARM high radiation alarm?

- A. Depress the evacuation siren pushbutton, and monitor other indications **only**.
- B. Announce over PA system for employees to evacuate the area, and monitor other indications **only**.
- C. Depress the evacuation siren pushbutton, notify Radcon to survey the area, and monitor other indications.
- D. Announce over PA system for employees to evacuate the area, notify Radcon to survey the area, and monitor other indications.

Answer: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.3.15	
	Importance Rating	2.9	
G2.3.15 Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			
<p>Explanation: CORRECT D: In all the High Rad Alarms from ARMs for areas in the plant, there are actions for the Unit Operator to take. Those actions are 1. Announce over PA system for employees to evacuate the area, 2. Contact Radcon to survey the area and 3. monitor other indications to determine the cause.</p> <p>A. Incorrect – Depressing the evacuation siren is only appropriate for total site evacuations once a Site Area Emergency is declared. Plausible that since areas need to be evacuated however not the entire site.</p> <p>B. Incorrect – These are not the only actions to perform, Radcon has to be contacted to survey the area and post it accordingly. Plausible that there are only two actions to take for the UO to take, assuming that the Unit Supervisor will contact Radcon.</p> <p>C. Incorrect – Depressing the evacuation siren is only appropriate for total site evacuations once a Site Area Emergency is declared. Plausible that since areas need to be evacuated however not the entire site.</p>			
Technical Reference(s): OPL171.034 Rev 11, ARP-9-3A Rev 42, EPIP 8 Rev 26			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.034 V.B.5			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge X Comprehension or Analysis	
10 CFR Part 55 Content:		55.41 (b)(11)	

### QUESTION 73

Which ONE of the following completes the statements below in accordance with RCI-9.1, Radiation Work Permits?

The Shift Manager has authorized immediate entry to an area in emergency situations, Radiation Protection \_\_ (1) \_\_ be required to escort personnel entering the area.

An RWP must be completed \_\_ (2) \_\_.

- A. (1) will  
(2) prior to entry
- B. (1) will  
(2) when the entry is completed
- C. (1) will NOT  
(2) prior to entry
- D. (1) will NOT  
(2) when the entry is completed

Answer B



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.3.7	
	Importance Rating	3.5	
Ability to comply with radiation work permit requirements during normal or abnormal conditions.			
<p>Explanation: <b>CORRECT B:</b> RP escort is required IAW RCI-9.1 and the RWP will be completed after the entry is completed or when the emergency is over.</p> <p>A – Incorrect – First part Correct. Second part Incorrect plausible in that all entries usually require an RWP prior to entry this is the one time it is completed after entry or after the emergency is over.</p> <p>C – Incorrect – First part Incorrect plausible that an escort is not required if the many entries to various areas of the plant do not require an RP escort, why would we want to expose additional personnel to an area and the conditions. Second part Incorrect see A above.</p> <p>D – Incorrect – First part Incorrect see C above and second part Correct.</p>			
Technical Reference(s): RCI-9.1 Rev 75			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available):			
Question Source:		Bank: X Modified Bank: New:	
Question History:		Previous NRC: None	
Question Cognitive Level:		Memory or Fundamental Knowledge: X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(12)	

**QUESTION 74 Rev 2**

In accordance with the Radiological Emergency Plan (REP), which Emergency Response Facility assumes command and control of the emergency response, once all the required Emergency Response Facilities are activated?

- A. MCR (Main Control Room)
- B. TSC (Technical Support Center)
- C. OSC (Operations Support Center)
- D. CECC (Central Emergency Control Center)

Answer B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G2.4.29	
	Importance Rating	3.1	
Knowledge of emergency plan.			
<p>Explanation: <b>CORRECT B:</b> TSC assumes command and control of the emergency.</p> <p>A – Incorrect – plausible in that the Control Room normally control responses to plant event and until the SM as SED is relieved this is correct.</p> <p>C – Incorrect – plausible in that this is the man power pool to operate or repair plant equipment is an emergency, OSC teams are dispatched and controlled by the OSC, there direction to form and dispatch is the TSC function.</p> <p>D – Incorrect – plausible in that the CECC when activated takes over protective action recommendations from the TSC.</p>			
Technical Reference(s): REP, EPIP-6 Rev 34			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.075 ILT 10			
Question Source:	Bank: Nine Mile 2 2010 NRC #75 Modified Bank: New:		
Question History:	Previous NRC: Nine Mile 2 2010 NRC #75		
Question Cognitive Level:	Memory or Fundamental Knowledge X Comprehension or Analysis :		
10 CFR Part 55 Content:	55.41 (b)(10)		

**QUESTION 75 Rev 2**

Which SSIs are allowed to be run in parallel with the EOIs and if there is a conflict between the SSI and the EOI, which takes precedence?

- A. 0-SSI-1-1 through 0-SSI-24; EOIs
- B. 0-SSI-1-1 through 0-SSI-24; SSIs
- C. 0-SSI-25-1 through 0-SSI-25-3 and 26; EOIs
- D. 0-SSI-25-1 through 0-SSI-25-3 and 26; SSIs

Answer D

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	G 2.4.5	
	Importance Rating	3.7	
Knowledge of organization of the operating procedures network for normal, abnormal, and emergency evolutions.			
<p>Explanation: <b>CORRECT D:</b> For SSIs 0-SSI-1-1 through 0-SSI-24, when entered from the EOIs, will supersede the EOIs. For SSIs 0-SSI-25-1, 0-SSI-25- 2, 0-SSI-25-3, and 0-SSI-26, EOIs will be used concurrently with these SSIs if EOI entry conditions have been met. If there is a conflict between the SSI and the EOI, the SSI will take precedence.</p> <p>A. Incorrect – the wrong set of SSIs were selected, but they are plausible because some of the SSIs can be run in parallel with the EOIs. The EOIs are normally the higher tier document in the Hierarchy of procedures so this is also plausible.</p> <p>B. Incorrect – the wrong set of SSIs were selected, but they are plausible because some of the SSIs can be run in parallel with the EOIs. The SSIs are considered the higher tier document in the Hierarchy of procedures to the EOIs so this part is correct.</p> <p>C. Incorrect – the right set of SSIs were selected so that part is correct. The EOIs are normally the higher tier document in the Hierarchy of procedures so this is also plausible.</p>			
Technical Reference(s): 0-SSI-001 OPL171.031			
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OPL171.031 Rev 14 ILT 6			
Question Source:		Bank: Modified Bank: New: X	
Question History:		Previous NRC:	
Question Cognitive Level:		Memory or Fundamental Knowledge X Comprehension or Analysis :	
10 CFR Part 55 Content:		55.41 (b)(10)	