

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	0000072421	
		Emergency Procedures/Plan - 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.	
	Importance	4	4.6

#### Question # 1

Given:

- The unit was at 50% power.
- The turbine tripped
- Bus 2A is de-energized
- Rod Bottom Lights are extinguished.
- Reactor Trip Breaker indicating lights (green and red) are extinguished.

What is the status of the reactor and what actions are required for this condition?

- The reactor IS NOT tripped.  
Manually trip the reactor.  
If reactor does not trip:  
Dispatch NPO to trip the reactor locally.  
Go To FR-S.1 if power is > 5%.
- The reactor IS tripped.  
Manually backup the reactor trip signal.  
Verify Turbine Trip.  
Verify 480V bus at least one energized.  
Check status of Safety Injection.
- The reactor IS NOT tripped.  
Manually actuate SI.  
If reactor does not trip:  
Manually insert Control Rods.  
Go To FR-S.1.

- D. The reactor IS tripped.  
Manually actuate SI.  
Verify Turbine Trip.  
Verify 480V bus at least one energized.  
Check status of Safety Injection.

Answer: A

Explanation/Justification:

A Correct. The breaker lights extinguished means the breakers have a trip signal but they are not tripped. The rod bottom lights are extinguished because 1 the reactor is not tripped and MCC 36C is not energized.

B. Incorrect. Plausible because decreasing neutron flux is an indication of a trip, but this decrease is due to temperature increase from turbine trip. The remainder of the actions would be true if the reactor was tripped.

C. Incorrect. Plausible for most accidents, tripping the reactor then initiating SI THEN go to E-0 is the flow path. Also, inserting control rods is directed in FR-S.1 and should not be performed before directed.

D. Incorrect. Plausible for most accidents, tripping the reactor then initiating SI THEN go to E-0 is the flow path.

Technical References:	3-E-0
Proposed References to be provided:	None

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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000008A218	
		Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: - Computer indications for RCS temperature and pressure	
	Importance	3	3

## Question # 2

While performing an RCS leakrate, the team observed the following trends on PICS have just started occurring:

- PZR pressure dropping
- PZR level is stable
- Containment sump level normal
- SG pressure normal
- SG level normal
- RCS Tavg normal
- Reactor power constant

Which ONE of the following is occurring?

- A. An RCS vessel leak that is within the capacity of the charging system.
- B. A small PZR steam space leak.
- C. A steam line break that is within the capacity of the SGWLCS.
- D. A SG tube leak.

Answer: B

Explanation/Justification:

Duplicated from question no 4120

A. Incorrect, but it is plausible a candidate may believe that PZR pressure would react more quickly than PZR and sump levels to a vessel leak.

B. Correct answer. A steam space leak will make PZR level tend to trend up or offset the downward trend due to mass loss. Eventually sumps will be affected.

C. Incorrect but plausible if the candidate misunderstands the effect on power and temperature.

D. Incorrect but plausible if the candidate believes SGWLC would mask a tube leak.

Technical References:	2-AOP-LEAK-1 3-AOP-LEAK-1
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Proposed References to be provided:	None
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Learning Objective	I2LP-ILO-RCSPZR 11 I3LP-ILO-AOPLEK 6
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Question Source:	Bank
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Question History:	Not NRC
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000009K327	
		Knowledge of the reasons for the following responses as they apply to the small break LOCA: - Manual depressurization or HPI recirculation for sustained high pressure	
	Importance	3.6	3.8

### Question # 3

Given:

- A LOCA occurred.
- RCS Pressure is 395 psig
- RCS Temperature is 440°F
- When RWST level decreased to 11.5 ft the crew initiated ES-1.3 Transfer to Cold Leg Recirculation.
- The crew was not able to establish minimum recirculation flowrate of 360 gpm.

Which of the following describes the action(s) required for these conditions?

- A. Depressurize RCS using PORV
- B. Establish RHR recirculation cooling
- C. Start/Stop HHSI pump as necessary
- D. Establish HHSI recirculation flow

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible because if it were possible, depressurizing would increase flow. However, existing conditions are saturated thus pressure would not lower significantly.
- B. Incorrect. Plausible because if unable to start recirculation pumps ES-1.3 direct the operator to establish recirc using RHR (Attachment 3). This would not be any more effective as RHR and Recirc pumps have the same operating characteristics.
- C. Incorrect. Plausible because similar actions are taken in ECA-1.3 for sump blockage.
- D. Correct. The procedure directs the operator to Attachment 4, Establishing HHSI Recirculation – Inadequate Low Head Flow.

Technical References: 3-ES-1.3

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPS10 3

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000011A103	
		Ability to operate and/or monitor the following as they apply to a Large Break LOCA: - Securing of RCPs	
	Importance	4	4

#### Question # 4

Given:

- SI actuated due to a LOCA.
- ALL SI Pumps failed to start and CANNOT be started.
- RCS pressure is 35 PSIG.
- CETs are 286 °F
- Containment pressure is 26 psig.
- The "RCP Bearing Coolant Low Flow" alarms have all annunciated
- The "Thermal Barrier CCW Header Low Flow" alarm has annunciated
- All other equipment is running per design.
- The crew is performing actions of E-0, Reactor Trip or Safety Injection.

What will the status of the RCPs be when the team transitions from E-0 to the appropriate EOP? Why?

- All RCPs will be stopped because the RCP trip criteria of the foldout page was met.
- All RCPs will be stopped to prevent mechanical damage to the pumps and motors.
- One RCP will be running to conserve remaining three if it is needed for degraded core cooling conditions.
- One RCP will be stopped to conserve it if it is needed for degraded core cooling conditions.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because the RCPs should be tripped; however, the foldout page criteria is not met without SI pumps operating.

B. Correct. With a Large Break LOCA and No CCW, the RCPs will only operate for < 5 minutes before the bearings overheat and the pumps are damaged. The pumps are secured for this reason.

C. Incorrect. Plausible because functional restoration procedure FR-C.2 secures one RCP to conserve it in the event it is needed later. This is similar logic that is not correct under these conditions.

D. Incorrect. Plausible because functional restoration procedure FR-C.2 secures one RCP to conserve it in the event it is needed later. This is similar logic that is not correct under these conditions.

Technical References:	2-E-0 3-E-0 WOG-Executive
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-EOPE00 15 I3LP-ILO-EOPE00 15
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Question Source:	Bank
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Question History:	Unit 3 NRC 2010
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Question Cognitive Level:	Synthesis Evaluation
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000015A122	
		Ability to operate and/or monitor the following as they apply to the Reactor Coolant Pump Malfunctions: - RCP seal failure/malfunction	
	Importance	4	4.2

#### Question # 5

A reactor trip was initiated when 31 RCP #1 seal leakoff exceeded 6 GPM.

Which one of the following correctly describes required actions relative to valve 261A, 31 RCP Seal Return?

Valve 261A is - - - - -

- A. closed before tripping 31 RCP
- B. closed immediately after tripping 31 RCP
- C. closed after 31 RCP has stopped rotating
- D. closed within 5 minutes after tripping 31 RCP

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the valve is close to ensure sufficient delta P is available for #2 Seal, but it is not closed until after the pump stops rotating.

B. Incorrect. Plausible because closing the valve will help minimize additional damage to #1 Seal; however, it is not closed until the pump stops rotating.

C. Correct.

D. Incorrect. Plausible because the valve is closed after pump stops rotating. Also, the excess seal return could cause backpressure on unaffected seals. The time period of 5 minutes is incorrect.

Technical References: 3-AOP-RCP-001

Proposed References to be provided: None

Learning Objective I3LP-ILO-AOPRCP 2  
I3LP-ILO-AOPRCP 3

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000022K103	
		Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: - Relationship between charging flow and PZR level	
	Importance	3	3.4

#### Question # 6

Which of the following conditions will cause Low Charging Flow alarm to annunciate and why?

- A. Loss of air to HCV-142, Charging Line Flow Control Valve  
HCV-142 fails shut resulting in an actual low charging flow condition.
- B. Level transmitter LT-459 fails high.  
Indicated high Pressurizer level will cause charging pump speed demand to lower to minimum.
- C. Loss of air to CH-AOV-204B, 31 Loop Cold Leg (Normal) Charging Isolation.  
AOV-204B fails closed resulting in an actual low charging flow condition.
- D. Level transmitter LT-460 fails high.  
Indicated high Pressurizer level will cause charging pump speed demand to lower to minimum.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because HCV-142 fails closed on a loss of air signal; however, the low charging flow alarm is driven by charging pump speed demand not actual flow conditions.

B. Incorrect. Plausible because an indicated high pressurizer level will drive the demand signal to minimum resulting in the alarm; however, LT-459 cannot be selected as the controlling channel and failure high will not result in a change in speed demand.

C. Incorrect. Plausible because loss of air causes most valves to fail closed however, 204B fails open, AND the low charging flow alarm is driven by charging pump speed demand not actual flow conditions.

D. Correct. LT-460 can be selected as controlling channel. Failure high will drive actual speed control signal down to minimum resulting in the alarm.

Technical References: 3-ARP-009

Proposed References to be provided: None

Learning Objective I3LP-ILO-CVC001 9

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	0000252222	
		Equipment Control - Knowledge of limiting conditions for operations and safety limits.	
	Importance	4	4.7

#### Question # 7

The following conditions existed at Unit 3 prior to the running RHR pump tripping due to a worker bumping the breaker:

- The plant was in a refueling outage.
- The Reactor Vessel Head was just tensioned.
- The plant was in Mode 5 with RCS level at 68.5 ft. and vented at CETNAs.
- Both loops of RHR were operable and one pump had been in operation for more than the past 8 hours.
- RCS Temperature was 125°F.
- Calculated time to boil was 55 minutes.

The following conditions exist after the pump tripped and was restored:

- The time without an RHR pump running was 20 minutes.
- RCS temperature reached 132°F based on CETs and is stable.
- No changes in RCS level or boron concentration occurred.
- RHR loops remained operable throughout the event.

Which of the following is correct for this event regarding Tech Specs LCO 3.4.8 RCS Loops – MODE 5. Loops Not Filled?

- The LCO was not met because RHR pumps may only be secured when steam generators are available for heat removal.
- The LCO was not met because RHR pumps were not running for >15 minutes.
- The LCO was met since two loops of RHR were operable.
- The LCO was met since the pump was returned to service with the time to boil.

Answer: B

Explanation/Justification:

For this condition, RHR pumps can both be secured for up to 15 minutes per TS 3.4.8.

A. Incorrect but plausible. The first part is correct. The second part is plausible since turning off all pumps would take away all heat removal for this condition.

B. Correct answer.

C. Incorrect but plausible. This could be allowed by TS 3.4.8, but other conditions apply as well that will not be met (i.e. exceeding 15 minutes).

D. Incorrect. There are risk assessment action based on time to boil, so this is plausible.

Technical References: Tech Specs

Proposed References to be provided: None

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Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000038K306	
		Knowledge of the reasons for the following responses as they apply to the SGTR: - Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures	
	Importance	4.2	4.5

#### Question # 8

Given:

- The plant was operating at 100%
- A Steam Generator Tube Rupture occurred on 33 SG,
- E-3, (Steam Generator Tube Rupture) was entered.
- RCS Cooldown and Depressurization is complete.
- The crew is attempting to minimize RCS to Secondary leakage.
- SG 33 narrow range level is 32% and lowering.
- Feed flow has been isolated to SG 33.
- SG 31, 32, and 34 narrow range levels are 40% and slowly lowering.
- PRZR level is 63% and rising.

Which one of the following describes the appropriate operator action?

- A. Turn on PRZR heaters
- B. Depressurize RCS.
- C. Lower Charging flow.
- D. Depressurize RCS and lower Charging flow.

Answer: A

Explanation/Justification:

Duplicated from question no 8686 Was a Unit 2 Open Reference Question.

All distractors are plausible. Depending on plant conditions, all of the actions listed are used to stabilize inventory balance between SG and RCS.

Conditions indicate that tube leakage exists from SG to RCS (SG level decreasing PRZR level increasing). RCS pressure is lower than SG pressure. To restore inventory balance, RCS pressure must be increased.

- A. Correct. This action will increase RCS pressure.
- B. Incorrect. This action will increase leakage from SG to RCS.
- C. Incorrect. This action will increase leakage from SG to RCS.
- D. Incorrect. These actions will increase leakage from SG to RCS.

Technical References: 3-E-3

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPE30 3

Question Source: Modified

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000040A110	
		Ability to operate and/or monitor the following as they apply to the Steam Line Rupture: - AFW System	
	Importance	4.1	4.1

#### Question # 9

Given:

- The plant tripped 25 minutes ago due to an inadvertent Main Steam Line Isolation.
- AFW flow is 200 gpm to each SGs.
- One Safety on each Steam Generator has stuck open.
- Narrow Range level is offscale low in all Steam Generators
- All equipment is operating as designed
- Wide range cold leg temperature is 440°F.
- Hot and Cold leg temperatures are decreasing slowly.

Based on current plant conditions, what action will the CRS direct with AFW flow per ECA-2.1 "Uncontrolled Depressurization Of All Steam Generators" and why?

- Maintain 200 gpm AFW flow to each Steam Generator to minimize thermal shock effects.
- Establish 100 gpm AFW flow to each Steam Generator to minimize thermal shock effects.
- Maintain 200 gpm AFW flow to each Steam Generator to ensure symmetrical cooling of reactor vessel.
- Establish 100 gpm AFW flow to each Steam Generator to ensure symmetrical cooling of reactor vessel.

Answer: B

Explanation/Justification:

Duplicated from question no 18632

A. Incorrect. Plausible because 200 gpm is the initial value established post trip and thermal shock is the correct reason why.

B. Correct. 100 gpm will keep components "wet" preventing thermal shock.

C. Incorrect. Plausible because 200 gpm is the initial value established post trip and symmetrical cooling would reduce reactor vessel stress.

D. Incorrect. Plausible because 100 gpm is correct, but the concern is thermal shock to SG components when AFW is re-established.

Technical References: 3-ECA-2.1 Background

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPE20 3

Question Source: Modified

Question History: NA

Question Cognitive Level: Comprehension

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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000054K101	
		Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): - MFW line break depressurizes the S/G (similar to a steam line break)	
	Importance	4.1	4.3

#### Question # 10

A catastrophic failure of the penetration weld for AFW connection with MFW for 34 SG has occurred.

The operating crew performed the actions of E-0 Reactor Trip or Safety Injection and transitioned to E-2, Faulted Steam Generator Isolation.

Which of the following describes the indications expected for this event?

- A. Main Feedwater Flow indication increased until feedwater isolation occurs.  
After E-2 actions are complete, 34 SG pressure and level will stabilize.
- B. Main Feedwater Flow indication decreased until feedwater isolation occurs.  
After E-2 actions are complete, 34 SG pressure and level will stabilize.
- C. Main Feedwater Flow indication decrease until feedwater isolation occurs.  
After E-2 actions are complete, 34 SG pressure and level will continue to decrease.
- D. Main Feedwater Flow indication increase until feedwater isolation occurs.  
After E-2 actions are complete, 34 SG pressure and level will continue to decrease.

Answer: D

Explanation/Justification:

This question requires knowledge of break location relative to instrumentation, system check valves and remotely operated valves. In addition, once isolated the indications will be similar to a steam break. The location of this break is downstream of the flow indicator thus flow indication will increase. Finally, there are no check valves or remotely operated valve between the break location and the SG thus the SG will completely depressurize.

A. Incorrect.

B. Incorrect.

C. Incorrect.

D. Correct.

Technical References:

Drawing

Proposed References to be provided:

None

Learning Objective

I3LP-ILO-EOPE20 4

Question Source:

New

Question History:

NA

Question Cognitive Level:

Comprehension

10 CRF Part 55 Content:

55.41 (b) 4

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000055A202	
		Ability to determine and interpret the following as they apply to a Station Blackout: - RCS core cooling through natural circulation cooling to S/G cooling	
	Importance	4.4	4.6

#### Question # 11

Consider the following plant conditions:

- Loss of all AC power has occurred
- Natural Circulation has been verified
- The Turbine Driven AFW pump is operating.
- A rapid cooldown has been commenced.

During the cooldown, what are the expected methods of control for the following:

- (1) 31-34 SG Turbine Driven ABFP flow control valves (FCV-405A, B, C & D) and
- (2) 31-34 Atmospheric Steam Dumps (PCV-1134 through 1137)

- A.
  - (1) Manual remote (CCR) control using air.
  - (2) Manual local control using nitrogen
- B.
  - (1) Manual local control using air
  - (2) Manual local control using air
- C.
  - (1) Manual local control using nitrogen
  - (2) Manual remote (CCR) control using air.
- D.
  - (1) Manual remote (CCR) control using air
  - (2) Manual remote (CCR) control using air.

Answer: D

Explanation/Justification:

Duplicated from question no 20479 (Unit 2 Question)

A. Incorrect. Air is available from the Ingersoll Rand Diesel Air Compressor and control from the control room is available. (1) is correct and (2) is not correct.

B. Incorrect: Manual local control of SG FCVs and atmospheric steam dumps is not required. Plausible because nitrogen backup is available for both SG FCVs and Atmospheric steam dumps. Both (1) and (2) are incorrect.

C. Incorrect: Air is available from the Ingersoll Rand Diesel Air Compressor and control from the control room is available. (1) is incorrect and (2) is correct.

D. Correct: Remote control (CCR) of the SG FCVs and Atmospheric is available using air from the Ingersoll Rand Diesel Air Compressor.

Technical References: 3-AOP-AIR-1  
3-ECA-0.0

Proposed References to be provided: None

Learning Objective I3LP-ILO-AFW001 4  
I3LP-ILO-MSS001 4

Question Source: Modified

Question History: Unit 2 NRC 2010

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000056K103	
		Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: - Definition of subcooling: use of steam tables to determine it	
	Importance	3.1	3.4

Question # 12

Given:

- A reactor trip occurred 20 minutes ago due to a Pilot Wire Trip resulting in a Loss of Offsite Power.
- RCS pressure is 1300 psig

Which of the following sets of indication confirm that Natural Circulation Exists?

	Core Exit Thermocouple	SG Pressure	RCS CL Temp
A.	536°F slowly lowering	665 psig (stable)	499°F slowly lowering
B.	549°F slowly lowering	539 psig (stable)	462°F slowly lowering
C.	436°F slowly lowering	870 psig (stable)	422°F slowly lowering
D.	543°F slowly lowering	280 psig (stable)	434°F slowly lowering

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Subcooling is 30°F CL Temp should be approx. 477°F

C. Incorrect. Subcooling is 143°F CL Temp should be approx. 530°F

B. Incorrect. Subcooling is 27°F CL Temp should be approx. 415°F

Technical References:	Steam Tables
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-EOPS00 3
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Question Source:	Bank
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Question History:	DC Cook NRC 2002
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Question Cognitive Level:	Comprehension
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000057A103	
		Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus: - Feedwater pump speed to control pressure and level in S/G	
	Importance	3.6	3.6

Question # 13

Given:

- 32 MBFP is operating in Manual using the Foxboro controller at the Flight Panel.
- 32A Instrument Bus is lost.
- Power will not be restored for several hours

Which of the following describes the effect on 32 MBFP speed control?

- A. Speed will increase until the pump trips on overspeed.
- B. Speed will decrease to minimum.
- C. Pump will go into Track and Hold.
- D. Speed will not be affected in Manual.

Answer: C

Explanation/Justification:

Loss of this bus will cause pump to go into Track and Hold.

A. Incorrect but plausible. It is plausible that the controller could lose power and fail to full speed. These controllers are usually in automatic adding to the plausibility of this misconception.

B. Incorrect but plausible. It is plausible that the controller could lose power and fail to low speed. These controllers are usually in automatic adding to the plausibility of this misconception.

C. Correct answer.

D. Incorrect but plausible. In Manual at the Startup Station, this would be correct. These controllers are usually in automatic adding to the plausibility of this misconception.

Technical References:

Proposed References to be provided:       None

Learning Objective                               I3LP-ILO-ICLOVE 3  
                                                          I3LP-ILO-ICLOVE 8

Question Source:                               New

Question History:                               NA

Question Cognitive Level:                   Comprehension

10 CRF Part 55 Content:                   55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000058K101	
		Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: - Battery charger equipment and instrumentation	
	Importance	2.8	3.1

Question # 14

A loss of DC Power Panel 32 has caused a BATTERY CHARGER TROUBLE alarm on CCR Panel SHF. How is the annunciator made available to alarm on any further battery charger alarm condition?

- A. Pressing the "Alarm Acknowledge" pushbutton on the Battery Charger Panel
- B. Taking the Normal/Bypass Switches on the Battery Charger Panel to BYPASS
- C. Acknowledging the alarm with the CCR "Acknowledge" pushbutton
- D. Opening the affected Battery Charger's output breaker

Answer: B

Explanation/Justification:

Duplicated from question no 1525 no significant modifications to this question.

A. Incorrect. Plausible because this action is correct for other equipment; however, there is no alarm acknowledge pushbutton on the battery charger panel.

B. Correct.

C. Incorrect. Plausible because some alarms have "reflash" capability meaning they will alarm again when a new condition occurs. This is not true for the Battery Charger Trouble alarm.

D. Incorrect. Plausible because opening the output breaker for a faulty piece of equipment will often clear an alarm. This is not true for the Battery Charger Trouble alarm.

Technical References: 3-ARP-011

Proposed References to be provided: None

Learning Objective I3LP-ILO-EDS125 2

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000062A202	
		Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: - The cause of possible SWS loss	
	Importance	2.9	3.6

Question # 15

Given:

- An inadvertent Safety Injection occurred during testing.
- During recovery the BOP notes the following:
  - Diesel Generator Trouble alarm is lit
- The Conventional NPO reports
  - High and High-High Water Temperature alarms are lit
  - Service Water Cooling Low Flow alarm is lit

What is the cause and required actions for these indications?

- A. 1176 and 1176A have failed closed due to loss of air. IA will be restored in E-0, Reactor Trip or Safety Injection.
- B. Service Water Pump Mode switch is in wrong position. Pumps supplying the header will be started in E-0, Reactor Trip or Safety Injection.
- C. 1176 and 1176A have failed closed due to loss of air. IA will be restored in RO-1, BOP Operator Actions During Use of EOPs.
- D. Service Water Pump Mode switch is in wrong position. Pumps supplying the header will be started in RO-1, BOP Operator Actions During Use of EOPs.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because valves 1176 and 1176A are AOVs. While E-0 and RO-1 start equipment to restore normal function, Instrument/Station air is not specifically addressed in either.

B. Incorrect. Plausible because the switch in the wrong position will cause the alarm. Essential Service Water Pumps are not started in E-0.

C. Incorrect. Plausible because valves 1176 and 1176A are AOVs. While E-0 and RO-1 start equipment to restore normal function, Instrument/Station air is not specifically addressed in either.

D. Correct. Incorrect switch position started pumps in the Non-Essential header. Pumps in the essential header will be started in RO-1.

Technical References: 3-RO-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-SW001 4  
I3LP-ILO-EOPE00 3

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	0000652402	
		Emergency Procedures/Plan - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. Note: The issue of setpoints and automatic safety features is not specifically covered in the systems sections.	
	Importance	4.5	4.6

#### Question # 16

Given the following:

- Station Air to Instrument Air is isolated.
- Unit 3 air systems are isolated from Unit 1 and 2 air systems.
- 31 Instrument Air Compressor (IAC) is running in HAND
- 32 IAC is in STANDBY

A leak develops in the instrument air system. As instrument air system pressure lowers, which of the following describes the automatic response and manual actions required by 3-AOP-AIR-1, Air Systems Malfunction?

- At 105 psig 32 IAC will start, and at 75 psig a manual reactor trip is required.
- At 105 psig 32 IAC will start, and at 60 psig a manual reactor trip is required.
- At 95 psig 32 IAC will start, and at 75 psig a manual reactor trip is required.
- At 95 psig 32 IAC will start, and at 60 psig a manual reactor trip is required.

Answer: D

Explanation/Justification:

- A. Incorrect but plausible if candidate cannot remember specific pressures.
- B. Incorrect but plausible if candidate cannot remember specific pressures.
- C. Incorrect but plausible if candidate cannot remember specific pressures.
- D. Correct answer. The standby IAC starts at 95 psig and 3-AOP-AIR-1 calls for reactor trip at 60 psig.

Technical References:	3-AOP-AIR-1 Syst Desc 29.2
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Proposed References to be provided:	None
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Learning Objective	I3LP-ILO-AOPAIR B
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 4
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	00WE11K303	
		Knowledge of the reasons for the following responses as they apply to the Loss of Emergency Coolant Recirculation: - Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	
	Importance	3.8	3.8

#### Question # 17

Given:

- A Loss of Coolant accident has occurred outside containment.
- RWST level has decreased to 1.2 feet
- SG pressures are 950 psig

Why are the SGs depressurized at a maximum rate to 700 psig?

- To ensure further depressurization doesn't cause Pressurized Thermal Shock.
- To establish adequate subcooling to restart an RCP.
- To ensure further depressurization doesn't cause the reactor to restart.
- To establish conditions for controlled injection of the accumulators.

Answer: D

Explanation/Justification:

- a. Incorrect. Some emergency procedures (e.g., E-3) have cooldown limits based on not exceeding PTS conditions. This is not true for this procedure.
- b. Incorrect. Plausible because attempting to start an RCP is an action in ECA-1.1 and a minimum value of subcooling is required; however, it is not the basis for this action.
- c. Incorrect. Plausible because depressurizing the SGs cools the RCS which adds positive reactivity.
- d. Correct.

Technical References: 3-ECA-1.1

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPE10 4

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	00WE052119	
		Conduct of Operations - Ability to use plant computers to evaluate system or component status	
	Importance	3.9	3.8

Question # 18

Given:

- An inadvertent reactor trip occurred during I&C testing.
- The crew is performing Step 4 of E-0, Reactor Trip or Safety Injection.
- No condition requiring SI exists.
- The Critical Safety Function Status summary on PICS indicates RED for Heat Sink.

Which of the following describes a valid condition for this indication and the actions required?

- Any SG NR level less than 9% AND total AFW flow < 365 gpm.  
At Step 5 of E-0, transition to FR-H.1, Response to Loss of Secondary Heat Sink.
- All SG NR levels less than 9% AND total AFW flow < 365 gpm.  
At Step 5 of E-0, transition to FR-H.1, Response to Loss of Secondary Heat Sink.
- Any SG NR level less than 9% AND total AFW flow < 365 gpm.  
Transition to ES-0.1, Reactor Trip Response, and then transition to FR-H.1, Response to Loss of Secondary Heat Sink.
- All SG NR levels less than 9% AND total AFW flow < 365 gpm.  
Transition to ES-0.1, Reactor Trip Response, and then transition to FR-H.1, Response to Loss of Secondary Heat Sink.

Answer: D

Explanation/Justification:

In order to meet red path conditions, ALL SG levels have to be < 9%. If there is no SI required, the flowpath to FR-H.1 is to transition to ES-0.1 where CSFSTs are monitored and immediately recognize that a red path exists. If an SI condition exists, step 5 will check AFW status.

A. Incorrect. Plausible because 9% and 365 gpm are the correct values for level and flow, but ALL levels must be below 9%. Most scenarios have an SI condition, so it is plausible that a candidate would pick step 5 guidance.

B. Incorrect. Plausible since first part is correct. Also, most scenarios have an SI condition, so it is plausible that a candidate would pick step 5 guidance.

C. Incorrect. Plausible because 9% and 365 gpm are the correct values for level and flow, but ALL levels must be below 9%. Second part is correct.

D. Correct

Technical References: OAP-012

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPROU 10

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000005A104	
		Ability to operate and/or monitor the following as they apply to the Inoperable/Stuck Control Rod: - Reactor and turbine power	
	Importance	3.9	3.9

#### Question # 19

##### Initial Conditions:

- A 20% load rejection from 100% has occurred and the crew is stabilizing the plant in accordance with the appropriate AOP.

##### Current Conditions:

- Control Bank "D" Group Counters are at 180 steps.
- H-2, a Control Bank "D" rod, indicates 230 steps on IRPI.
- All other Control Bank "D" rods indicate 180 steps on IRPI.
- I&C reports:
  - Stationary Gripper Fuse NORMAL
  - Lift Coil Fuse NORMAL
  - Movable Gripper Fuse BLOWN

Which ONE (1) of the following describes the current condition of rod H-2 and the appropriate actions in accordance with Technical Specifications and AOP?

- Trippable; Maintain Tavg and Tref within 1.5°F using boration and turbine load
- Untrippable; Initiate shutdown to be in MODE 3 in 6 hours using boration and turbine load.
- Untrippable; Reduce Thermal Power to  $\leq 75\%$  using boration and turbine load within 2 hours
- Trippable; Reduce Thermal Power to  $\leq 50\%$  using boration and turbine load within 30 minutes.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Maintaining Tavg and Tref is a valid action in AOP-ROD -1; however the rod is untrippable. A blown moveable gripper fuse should have resulted in the rod ratcheting in when both rod movement was in progress. The rod is untrippable.

B. Correct. The rod is untrippable i.e., INOPERABLE. TS action is to initiate a shutdown.

C. Incorrect. Plausible because the rod is untrippable and the statement is correct for a misaligned rod; however, shutdown to MODE 3 is required.

D. Incorrect. Plausible because this is an actual action statement in TS that addresses challenges to hot channel factors. A blown moveable gripper fuse should have resulted in the rod ratcheting in when both rod movement was in progress. The rod is untrippable.

Technical References:	2-AOP-ROD-1
	3-AOP-ROD-1
	Tech Specs

Proposed References to be provided:	None
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Learning Objective	I2LP-ILO-ICROD 14
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 2
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000033A208	
		Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: - Intermediate range channel operability	
	Importance	3.3	3.4

#### Question # 20

The plant is operating at 75% power. IR channel N-36 has been removed from service due to a faulty power supply. IR channel N-35 fails high.

I&C reported it will take approximately 12 hours or longer to fix channel N36, and requests that the channel be removed from service.

Which of the following is the correct action for the existing plant conditions?

- A. DO NOT remove N-35 from service. This will result in a reactor trip.
- B. Enter LCO 3.0.3 and be in MODE 3 in 7 hours..
- C. Immediately suspend positive reactivity additions and reduce THERMAL POWER to < P-6 in 2 hours..
- D. Remove Channel N-35 from service. No IR Neutron Flux channels are required above 10% Thermal Power.

Answer: D

Explanation/Justification:

Duplicated from question no 2561

A. Incorrect. Plausible because removal of a channel from service generally trips bistables; however, IR channel trips are blocked above 10% power.

B. Incorrect. Plausible because it may appear that there is no LCO for 2 inoperable IR channels; however, at >10% power no IR channels are required by TS.

C. Incorrect. Plausible because this is the action if power is > P-6 and < P-10.

D. Correct. Plausible because at >10% power no IR channels are required by TS.

Technical References:	3-AOP-NI-1 Tech Specs
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Proposed References to be provided:	None
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Learning Objective	I3LP-ILO-ICEXC 10
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Question Source:	Modified
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000060K201	
		Knowledge of the interrelations between the Accidental Gaseous Radwaste Release and the following: - ARM system, including the normal radiation-level indications and the operability status	
	Importance	2.6	2.9

#### Question # 21

With U3 at 100% power, operators note an increase on R-27 effluent monitor indicating an inadvertent gaseous release. If the leak was at the inlet of the Reactor Coolant Filter, which of the following describes a radiation monitor response that could confirm the source of the leak?

- A. Increase in general area dose rate indication on R-68 on 15' PAB elevation.
- B. Increase in particulate activity on R-68 on 15' PAB elevation.
- C. Increase in general area dose rate indication on R-65 on 73' PAB elevation.
- D. Increase in particulate activity on R-65 on 73' PAB elevation.

Answer: C

Explanation/Justification:

There are radiation monitors throughout the U3 PAB. It is important the candidates understand that these are just area radiation monitors. These are not monitored that are routinely addressed by AOPs and EOPs, so a less than adequately prepared candidate may believe these monitors measure particulate activity. Adding to the plausible confusion of what these radiation monitors measure is the fact that the radiation protection group has portable particulate monitors throughout the PAB. In order to make a valid multiple choice question, this also tests location of plant equipment. There is a filter cell in the 15' PAB. However, the Reactor Coolant Filter is on 73' PAB in a cell that is not often accessed. A less than adequately prepared candidate may not know the location.

A. Incorrect but plausible if the candidate believes the reactor coolant filter is with the other plant filters in the 15' filter cell.

B. Incorrect but plausible if the candidate believes the reactor coolant filter is with the other plant filters in the 15' filter cell, and also believes the radiation monitor is a particulate monitor.

C. Correct answer.

D. Incorrect but plausible if the candidate believes the radiation monitor is a particulate monitor.

Technical References: 3-SOP-RM-010

Proposed References to be provided: None

Learning Objective I3LP-ILO-RMSARM 4

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 11

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	0000672239	
		Equipment Control - Knowledge of less than or equal to one hour technical specification action statements for systems.	
	Importance	3.9	4.5

Question # 22

Given the following:

- The sprinkler system in the AFW pump room is INOPERABLE.
- All smoke detectors in the AFW pump room are verified OPERABLE.

Complete the following statement:

The type of sprinkler system in the AFW pump room is \_\_\_\_\_, and due to this condition a \_\_\_\_\_ fire watch is required by the TRM.

- A. Wet Pipe      Hourly
- B. Wet Pipe      Continuous
- C. Dry Pipe      Hourly
- D. Dry Pipe      Continuous

Answer: A

Explanation/Justification:

Per TRO 3.7.A, the AFW pump room sprinkler system is a wet pipe system. Per Condition A, we have an hour to verify smoke detectors are operable and establish a 1 hour fire watch.

A. Correct answer.

B. Incorrect but plausible. The first part is correct. The second part is plausible since a continuous fire watch is established if the smoke detectors are not operable.

C. Incorrect but plausible. The first part is plausible since the plant has dry pipe in other areas with sensitive equipment. The second part is correct.

D. Incorrect but plausible. The first part is plausible since the plant has dry pipe in other areas with sensitive equipment. The second part is plausible since a continuous fire watch is established if the smoke detectors are not operable.

Technical References:	TRM
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-FPS001 10
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000069K203	
		Knowledge of the interrelations between the Loss of Containment Integrity and the following: - Personnel access hatch and emergency access hatch	
	Importance	2.8	2.9

#### Question # 23

Which one of the following conditions is a loss of containment integrity as defined in Technical Specifications?

- A. The 95' inner airlock door seal is leaking and the outer door is opened for 2 hours to allow access for repairs in MODE 2.
- B. The 80' air lock inner door is found with strong backs installed in MODE 3.
- C. A manual valve is closed to isolate a penetration where an electrician disconnected the auto close feature of a containment isolation valve in MODE 4.
- D. The leakage rate of a containment penetration exceeds the limits of Technical Specifications while in MODE 5.

Answer: A

Explanation/Justification:

A. Correct: 3.6.2 allows access through the locked closed airlock door to perform repairs but only for transit and for "short periods". Leaving the door open for 2 hours is not consistent with the spec.

B. Incorrect: This makes the airlock unusable but does not violate the spec.

C. Incorrect: This is permissible by the TS 3.6.3.A.1.

D. Incorrect: containment integrity is only required in modes 1-4.

Technical References:	Tech Specs
Proposed References to be provided:	None

Learning Objective	I0LP-ILO-ITS001 1
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Question Source:	Bank
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Question History:	Unit 2 NRC 2008
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000076K201	
		Knowledge of the interrelations between the High Reactor Coolant Activity and the following: - Process radiation monitors	
	Importance	2.6	3

Question # 24

The operating team has entered AOP-HIACT-1, High RCS Activity, due to elevated RCS activity as noted by Chemistry. Which of the following is true regarding R-63 (Gross Failed Fuel Detector) readings per AOP-HIACT-1?

- A. If R-63 is in alarm, verify that RCS sample isolation valves has automatically closed.
- B. If R-63 is in alarm, verify that letdown has automatically diverted through the standby mixed bed.
- C. If activity on R-63 is > 50  $\mu\text{Ci/cc}$ , then no samples of the RCS are to be taken.
- D. If activity on R-63 is > 50  $\mu\text{Ci/cc}$ , then consideration should be given to using the Post-Accident Sampling System.

Answer: D

Explanation/Justification:

- A. Incorrect but plausible because there are radiation monitors that automatically isolate valves.
- B. Incorrect but plausible because this action is specified by the procedure. It's just not an automatic action.
- C. Incorrect but plausible because 50  $\mu\text{Ci/cc}$  is a procedure decision level.
- D. Correct answer per the note before step 4.3 of AOP-HIACT-1.

Technical References:	3-AOP-HIACT-1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-AOPACT 3
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Question Source:	Bank
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Question History:	None
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	00WE13K202	
		Knowledge of the interrelations between the Steam Generator Overpressure and the following: - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	
	Importance	3	3.2

#### Question # 25

Given:

- The plant experienced an inadvertent SI.
- 31 SG Pressure is 1130 psig and stable.
- All attempts to dump steam from 31 SG have been ineffective.
- The team is in FR-H.2, Response to Steam Generator Overpressure.
- RCS Hot Leg Temperatures are 560°F and stable.
- All MSIVs are closed

Which of the following will be directed by FR-H.2 to address these conditions?

- A. Feed 31 SG with cold AFW.
- B. Trip 31 RCP.
- C. Cooldown RCS using 32, 33, 34 Atmospherics
- D. Align blowdown from 31 SG to the flash tank

Answer: C

Explanation/Justification:

Duplicated from question no 20825

A. Incorrect. Plausible because feeding with cold water would lower pressure, however the procedure isolates AFW until a steam release path is established.

B. Incorrect. Plausible because it would reduce heat transfer into the affected SG.

C. Correct. The procedure directs a cooldown if  $T_{hot}$  is  $> 520^{\circ}$

D. Incorrect. Plausible because blowdown can aid in cooling, but aligning to the flash tank will not change anything.

Technical References: 3-FR-H.2

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPFRH 4

Question Source: Modified

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	00WE152120	
		Conduct of Operations - Ability to interpret and execute procedure steps.	
	Importance	4.6	4.6

Question # 26

The following conditions exist:

- A large break LOCA has occurred.
- The plant is tripped and ECCS is operating as expected.
- Accumulators have discharged and are isolated.
- The STA reports an ORANGE path on Containment

Which one of the following describes the required actions per FR-Z.2, Response to Containment Flooding and their purpose?

- A. Secure all water sources from outside of containment to prevent damaging vital components
- B. Secure all water sources from outside of containment to prevent overloading concrete containment structures.
- C. Isolate source of flooding in an attempt to prevent damaging vital components
- D. Isolate source of flooding in an attempt to prevent overloading concrete containment structures.

Answer: C

Explanation/Justification:

Duplicated from question no 16922

A. Incorrect. Plausible because procedure does secure the leaking system not all possible sources.

B. Incorrect. Plausible because procedure does secure the leaking system not all possible sources.

C. Correct.

D. Incorrect. Plausible because isolating the source of the leak (Not all water sources) is correct, overloading concrete is not.

Technical References:	2-FR-Z.2 2-FR-Z.2 BG 3-FR-Z.2 3-FR-Z.2 Background
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-EOPFRZ 4
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Question Source:	Modified
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Question History:	Unit 2 NRC 2004
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 9
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	00WE16K202	
		Knowledge of the interrelations between the High Containment Radiation and the following: - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	
	Importance	2.6	3

Question # 27

Given:

- Digital Metal Impact Monitor alarmed
- RCS Activity increased
- During Shutdown a small break LOCA occurred
- Containment radiation spiked at  $3 \times 10^5$  R/hr and is currently  $4 \times 10^4$  R/hr.
- VC Temp spiked at  $192^\circ$  and is currently  $157^\circ$
- The crew is performing ES-1.2, Post LOCA Cooldown and Depressurization.

Which of the following describes the process parameter values used (Normal vs Adverse) to determine if an RCP should be started?

- Use Normal Values; both process parameters are currently below the value for Adverse Containment.
- Use Normal Values: only containment temperature exceeded the setpoint and it is currently below the value for Adverse Containment.
- Use Adverse Values; only containment radiation exceeded and remains above the setpoint.
- Use Adverse Values; both process parameters exceeded the setpoints and are currently below the value for Adverse Containment.

Answer: D

Explanation/Justification:

Duplicated from question no 26560

A. Incorrect. Plausible because both parameters are below Adverse Values, however, if VC Radiation exceeds limit, normal values are not used until an engineering evaluation has been performed.

B. Incorrect. Plausible because VC Temp did exceed the Adverse limit; however, VC Radiation also exceeded the limit.

C. Incorrect. Plausible because VC Rad did exceed the limit and Adverse values should be used, but the value is below the limit.

D. Correct. Both exceeded the limit; both are below the limit; Adverse values are still required due to exceeding Radiation Levels.

Technical References:	WOG-Executive
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-EOPROU 23
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Question Source:	Modified
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Question History:	Unit 2 NRC 2014
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	003000K604	
		Knowledge of the effect of a loss or malfunction of the following will have on the RCPS: - Containment isolation valves affecting RCP operation	
	Importance	2.8	3.1

#### Question # 28

A malfunction caused MOV-222, Seal Return, from RCPs to go closed.

What are the consequences of allowing the RCP's to continue operation?

- A. Seal return flow cycles based on relief valve position.  
Pump operation may continue.
- B. Seal return flow decreases to 0.  
AOP-RCP-1, Reactor Coolant Pump Malfunctions, will direct tripping RCPs if condition last > 5 minutes.
- C. Seal return flow decreases to 0.  
Pump operation may continue.
- D. Seal return flow cycles based on relief valve position.  
AOP-RCP-1, Reactor Coolant Pump Malfunctions, will direct tripping RCPs if condition last > 5 minutes.

Answer: A

Explanation/Justification:

A. Correct. A relief valve to the PRT will maintain seal return flow.

B. Incorrect. Plausible closing MOV-222 isolates seal return from all pumps to the VCT; however a relief valve to the PRT will maintain seal return flow.

C. Incorrect. Plausible closing MOV-222 isolates seal return from all pumps to the VCT; however a relief valve to the PRT will maintain seal return flow. Also continued pump operation with seal injection is true for loss of thermal barrier cooling.

D. Incorrect. Plausible because with seal return cycling AOP-RCP-1 may direct a trip..

Technical References: 3-AOP-RCP-001

Proposed References to be provided: None

Learning Objective I3LP-ILO-RCSRCP 10

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	004000K637	
		Knowledge of the effect of a loss or malfunction on the following CVCS components: - Boron loading of demineralizer resin	
	Importance	2.9	3.4

#### Question # 29

Given:

- The unit is at 100% power 2 months after a refueling outage
- 31 demineralizer has been in service since the outage.
- 32 demineralizer resin was replaced one month after the outage.
- A weld leak was detected on 31 Demineralizer.
- The crew opened 32 Demineralizer inlet valve and closed 31 Demineralizer inlet valve to place 32 Demineralizer in service.
- Letdown and Charging parameters returned to pre-event values.

Which of the following describes the effects of placing 32 Demineralizer in service over the next several hours?

- RCS Temperature will increase until 32 demineralizer temperature is stable at letdown temperature.
- RCS Temperature will increase until 32 demineralizer boron concentration is stable at letdown boron concentration.
- RCS Temperature will decrease until 32 demineralizer temperature is stable at letdown temperature.
- RCS Temperature will decrease until 32 demineralizer boron concentration is stable at letdown boron concentration.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because change in letdown temperature can affect demineralizer outlet boron concentration; however, letdown temperature did not change.

B. Correct. A fresh mixed bed demineralizer will reduce RCS boron concentration until it is saturated.

C. Incorrect. Plausible because temperature will change and could decrease if resin was saturated at a higher boron concentration. Also, letdown temperature can affect demineralizer outlet boron concentration; however, letdown temperature did not change.

D. Incorrect. Plausible because temperature will change and could decrease if resin was saturated at a higher boron concentration.

Technical References: 3-SOP-CVCS-004

Proposed References to be provided: None

Learning Objective I3LP-ILO-CVC001 4

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	004000A404	
		Ability to manually operate and/or monitor in the control room: - Calculation of boron concentration changes	
	Importance	3.2	3.6

Question # 30

The reactor is in hot shutdown with RCS temperature at 550°F. In order to comply with the shutdown margin requirements for a special test, RCS Boron concentration must be increased from the current value of 1800 to 2050 PPM.

PICs computer is out of service.

Calculate the required quantity of boric acid solution to be added assuming a boric acid concentration of 12%.

- A. 780 Gal.
- B. 800Gal.
- C. 835Gal.
- D. 855 Gal.

Answer: C

Explanation/Justification:

Each distractor is plausible if nomograph is improperly implemented

A. Incorrect

B. Incorrect

C. Correct

D. Incorrect

Technical References: 3-GRAPH-CVCS-5

Proposed References to be provided: 3-GRAPH-CVCS-5

Learning Objective I3LP-ILO-POP001 3

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 1

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	005000K306	
		Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: - CSS	
	Importance	3.1	3.2

Question # 31

Given:

- A large break LOCA occurred 3 hours ago.
- The Recirculation system is lined up for core cooling and containment spray.
- Containment pressure is 2 psig and lowering slowly.
- 32 Recirc Pump is running
- 32 RHR heat exchanger is in service

32 Recirc Pump tripped on overcurrent.

Which of the following describes actions for this event?

- A. Start 31 Recirc Pump.  
Spray flow is required to be re-established.
- B. Start 31 Recirc Pump.  
Spray flow is no longer required.
- C. Start 32 RHR Pump.  
Spray flow is required to be re-established
- D. Start 32 RHR Pump.  
Spray flow is no longer required.

Answer: A

Explanation/Justification:

At IPEC Recirculation Pumps are the primary means to provide long term core cooling following a large LOCA. The Recirc Pumps circulate water through the RHR heat exchangers. RHR pumps are a backup means for providing long term cooling.

A. Correct.

B. Incorrect. Plausible because starting 31 Recirc Pump is correct; however, spray flow is required for 4 hours for iodine scrubbing.

C. Incorrect. Plausible because candidate may believe that 32 heat exchanger must be supplied by either 32 Recirc or 32 RHR pump. In addition, spray flow must be re-established.

D. Incorrect. Plausible because candidate may believe that 32 heat exchanger must be supplied by either 32 Recirc or 32 RHR pump. Spray flow is required for 4 hours for iodine scrubbing.

Technical References: 3-ES-1.3

Proposed References to be provided: None

Learning Objective I3LP-ILO-RHR001 11

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	005000A202 Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Pressure transient protection during cold shutdown	
	Importance	3.5	3.7

#### Question # 32

With unit is in cold shutdown on RHR cooling, RCS pressure spiked to 600 psig. MOV-730/731, RHR pumps suction valves are going closed. When can MOV-730/731 be reopened?

- A. As soon as pressure is less than 550 psig. The valves stroke direction can be changed mid stroke.
- B. As soon as pressure is less than 450 psig. The valves stroke direction can be changed mid stroke.
- C. As soon as pressure is less than 550 psig AND the valves have fully stroked closed.
- D. As soon as pressure is less than 450 psig AND the valves have fully stroked closed.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because Valves will close if pressure exceeds 550 but cannot be reopened until pressure decreases below 450. Also valves must travel full stroke before they can be reopened.

B. Incorrect. Plausible because pressure must be below 450 to reopen the valves; however, the valves must go full stroke before they can be opened.

C. Incorrect. Plausible because Valves will close if pressure exceeds 550 but cannot be reopened until pressure decreases below 450. Also valves must travel full stroke before they can be reopened.

D. Correct.

Technical References:	3-AOP-RHR-1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-RHR001 5
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Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	006000A111	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: - Boron concentration	
	Importance	3.1	3.4

Question # 33

During I&C testing an inadvertent SI signal was generated on train A. The crew responded in accordance with E-0, Reactor Trip or Safety Injection, and transitioned to ES-1.1, Safety Injection Termination when directed. During the reactor trip, the ATC reported 2 control rods failed to insert. All other systems responded as designed.

Which of the following is true?

- A. Emergency boration will be required in ES-1.1 for stuck rods only if temperature decreases below 540°F.
- B. Emergency boration will be required in ES-1.1 for one stuck rod to ensure adequate SDM.
- C. Emergency boration will NOT be required in ES-1.1, ECCS flow will ensure adequate SDM.
- D. Emergency boration will NOT be required in ES-1.1, Hot Shutdown Boron concentration will provide adequate SDM.

Answer: B

Explanation/Justification:

KA Justification: For plant conditions that require Safety Injection, emergency boration is NOT evaluated because adequate boron is added via SI flow from RWST. For this condition, SI flow will not occur because pressure will not decrease below 1550 psig. As a result, boron concentration must be increased using emergency boration to ensure adequate shutdown margin with 2 stuck rods.

A. Incorrect. Plausible because emergency boration would be required if one rod was stuck and temperature decreased to  $< 240^{\circ}\text{F}$ . Temperature will not decrease to less than  $540^{\circ}\text{F}$  for an inadvertent SI with all systems functioning as designed.

B. Correct. ES-1.1 checks to see if emergency boration is required to establish adequate SDM.

C. Incorrect. Plausible because for accidents that do not transition to ES-1.1, SDM is established using ECCS flow from the RWST.

D. Incorrect. Plausible because Hot Shutdown Boron concentration provides adequate SDM for one stuck rod.

Technical References:	Syst Desc 10.1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-SIS001 4
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 8
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	0060002225	
		Equipment Control - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	
	Importance	3.2	4.2

Question # 34

Which of the following correctly describes the Technical Specification basis for the minimum RWST level and Boron Concentration?

- A. Sufficient inventory exists in the sump to support continued operation of ECCS and Containment Spray during recirculation phase.  
Sufficient boron exists to ensure reactor remains shutdown following a MSLB or LOCA.
- B. Sufficient inventory ensures switchover occurs before RWST empties to prevent ECCS pump damage.  
Sufficient boron exists to ensure pH that assists in reducing the iodine fission product inventory.
- C. Sufficient inventory exists in the sump to support continued operation of ECCS and Containment Spray during recirculation phase.  
Sufficient boron exists to ensure pH that assists in reducing the iodine fission product inventory.
- D. Sufficient inventory ensures switchover occurs before RWST empties to prevent ECCS pump damage.  
Sufficient boron exists to ensure reactor remains shutdown following a MSLB or LOCA.

Answer: A

Explanation/Justification:

A. Correct. Adequate Level (inventory) must exist to provide NPSH for Recirc or RHR pumps. Also adequate boron exists to ensure the reactor remains subcritical.

B. Incorrect. Plausible because inventory statement is one of the bases for RWST Low Level Alarm. Boron concentration statement is incorrect, but plausible because pH is a consideration addressed using sodium tetraborate baskets in the VC.

C. Incorrect. Level statement is correct; boron statement is incorrect.

D. Incorrect. Level statement is incorrect and boron statement is correct.

Technical References:	Tech Specs
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-SIS001 10
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	007000A102	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: - Maintaining quench tank pressure	
	Importance	2.7	2.9

Question # 35

Given:

- The plant is operating at 100% power
- All control systems are in Automatic
- PCV 473 PRT Nitrogen supply pressure regulator, malfunctions and raises PRT pressure to 50 psig before the crew is able to isolate the nitrogen supply to the PRT

What action is required to reduce PRT pressure, and what are the consequences of not performing this action?

- A. Spray the PRT, to avoid PRT rupture disk deformation.
- B. Vent the PRT, to avoid PRT rupture disk deformation.
- C. Spray the PRT, to avoid inhibiting proper PORV operation.
- D. Vent the PRT, to avoid inhibiting proper PORV operation.

Answer: B

Explanation/Justification:

A. Incorrect Spraying the PRT will be ineffective since the pressure rise is due to an inert gas, not high temperature. Plausible because spraying down a system normally lowers pressure.

B. Correct. Precaution and Limitation 2.7 of SOP 1.6 rev 29

C. Incorrect. Spraying the PRT will be ineffective since the pressure rise is due to an inert gas, not high temperature. Plausible because normally spraying down a system would lower pressure.

D. Incorrect Plausible because venting the PRT is correct

Technical References: 2-SOP-1.6  
3-SOP-RCS-007

Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSPZR 11d  
I3LP-ILO-RCSPZR 2

Question Source: Bank

Question History: Unit 2 NRC 2012

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 3

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	008000A201	
		Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of CCW pump	
	Importance	3.3	3.6

#### Question # 36

Unit 3 is operating at full power, with normal system alignments. One CCW pump tripped resulting in auto start of the 32 CCW pump. The Control Room Crew has entered 3-AOP-CCW-1. Loss of Component Cooling Water, and progressed to the procedure step which asked, "Is CCW pump discharge pressure >100psig?"

What is the significance of the >100 psig verification, and what actions can be taken to restore pressure?

- A. If pressure <100 psig, inadequate CCW flow capability exists for Post LOCA system alignment. Reduce CCW loads to restore pressure.
- B. If pressure < 100 psig, the Reactor Coolant Pumps must be tripped within 5 minutes. Reduce CCW loads to restore pressure.
- C. If pressure is >100 psig, CCW relief valves are likely to be lifting. Bypass automatic temperature control valves to reduce pressure.
- D. If pressure is > 100 psig, CCW heat exchanger blockage is suspected. Bypass automatic temperature control valves to reduce pressure.

Answer: A

Explanation/Justification:

Duplicated from question no 2595

A. Correct.

B. Incorrect. Plausible because if CCW flow is lost to RCPs then they must be tripped within 5 minutes; reducing loads would increase pressure.

C. Incorrect. Plausible because if a high pressure condition existed bypassing automatic temperature control valves would reduce pressure.

D. Incorrect. Plausible because bypassing temperature control valves would reduce pressure.

Technical References:	3-AOP-CCW-1 3-AOP-CCW-1 Background
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-AOPCCW 3
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Question Source:	Modified
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	010000A106	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR PCS controls including: - RCS heatup and cooldown effect on pressure	
	Importance	3.1	3.2

#### Question # 37

A rapid load rejection occurred due to closure of a turbine stop valve. You observe the following:

- pressurizer sprays partially open
- modulating heaters full off
- backup heaters on

Which of the following would cause these indications?

- Controlling pressurizer pressure channel failed high
- Pressurizer level surge from the downpower
- Controlling pressurizer level channel failed low
- Pressurizer program level decrease from the downpower

Answer: B

Explanation/Justification:

KA Justification: A rapid load rejection event results in an RCS heatup. This rapid heatup results in a pressurizer insurge and increase in pressurizer pressure. If the load rejection is large enough the increase in pressure will initiate pressurizer spray to control pressure. Subsequently, the system will experience an outsurge which will result in a pressure decrease. To minimize this pressure reduction, the backup heaters are energized.

- A. Incorrect but plausible. This instrument failure would lead to all of these conditions except sprays would be full open.
- B. Correct answer per the system description. This satisfies the KA because this controller feature is ensure RCS pressure stays within design limits during an expected power maneuver.
- C. Incorrect but plausible. Plausible since these conditions would occur if the level channel failed high.
- D. Incorrect but plausible. Plausible since the only indication that should not be present is that sprays would not be open.

Technical References:	Syst Desc 1.4
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-RCSPZR 4 I3LP-ILO-RCSPZR 3
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Question Source:	Bank
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Question History:	None
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	012000A101	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPS controls including: - Trip setpoint adjustment	
	Importance	2.9	3.4

Question # 38

Given the following Tech Spec Conditions in Mode 1:

1.  $F_Q(Z)$  not within limit
2. QPTR not with limit
3. One or more required MSSVs inoperable

Determine which of the following correctly lists the conditions that could require reducing neutron flux trip setpoints?

- A. 1 AND 2
- B. 1 AND 3
- C. 2 AND 3
- D. 1 AND 2 AND 3

Answer: B

Explanation/Justification:

FQ(Z) not within limit is Condition A of LCO 3.2.1 and requires setpoint adjustment. One or more required MSSVs inoperable is Condition A of LCO 3.7.1 and requires setpoint adjustment. QPTR not with limit is Condition A of LCO 3.2.4 and does NOT require reducing trip setpoints. It is plausible that a candidate would believe QPTR does require adjustment because there is an action to normalize excore detectors.

Technical References: Tech Specs

Proposed References to be provided: None

Learning Objective I3LP-ILO-ICRCT 5

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	013000A402	
		Ability to manually operate and/or monitor in the control room: - Reset of ESFAS channels	
	Importance	4.3	4.4

Question # 39

The following plant conditions exist:

- A steam break occurred outside the VC upstream of 31 MSIV.
- A Safety Injection was manually actuated.
- All systems responded as expected except Reactor Trip Breaker “B” (RTB), which is still closed and cannot be opened.
- Immediately prior to resetting Safety Injection in E-0, Reactor Trip or Safety Injection, the following parameters are noted:
  - Pressurizer pressure is 2050 psig and increasing slowly.
  - Containment pressure is 0.0 psig and stable.
  - 32, 33, 34 Steam generator pressures are all 875 psig and increasing slowly.
  - 31 Steam generator is completely depressurized
  - The BOP resets both trains of SI using the Train “A” and Train “B” Signal Reset pushbuttons.

What is the status of the Safety Injection logic?

	Train A SI signal	Train B SI signal	Train A SI Auto Actuation	Train B SI Auto Actuation
A.	Reset	Not Reset	Not Blocked	Not Blocked
B.	Reset	Reset	Blocked	Blocked
C.	Reset	Not Reset	Blocked	Not Blocked
D.	Not Reset	Not Reset	Not Blocked	Not Blocked

Answer: C

Explanation/Justification:

Duplicated from question no 26335

With NO SI signal still present, SI will reset; however with a reactor trip breaker closed, the Auto SI signals are NOT blocked for that train. For this question, Train A SI signal will reset and Train A Auto SI signals will be blocked. Train B SI signal will momentarily reset, but since Train B Auto SI signal will not be blocked, Train B SI signal will re-actuate. This re-actuation will only occur on Train B.

A. Incorrect. Plausible because Train A SI signal; is correct, Train B SI signal is correct, Train A SI Auto Actuation is NOT CORRECT, and Train B SI Auto Actuation is correct.

B. Incorrect. Plausible because Train A SI signal; is correct, Train B SI signal is NOT CORRECT, Train A SI Auto Actuation is correct, and Train B SI Auto Actuation is NOT CORRECT.

C. Correct

D. Incorrect. Plausible because Train A SI signal; is NOT CORRECT, Train B SI signal is correct, Train A SI Auto Actuation is NOT CORRECT, and Train B SI Auto Actuation is correct.

Technical References:	Drawing
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-ESS001 3
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	022000K402	
		Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: -	
		Correlation of fan speed and flowpath changes with containment pressure	
	Importance	3.1	3.4

Question # 40

Upon receipt of a Safety Injection actuation signal the Fan Cooler Filter Units dampers are aligned to which of the following positions?

- A. Blow-in door open, damper A open, dampers B & D closed, and damper C throttled
- B. Blow-in door closed, damper D closed, and dampers A, B & C open
- C. Blow-in door open, dampers C & D open, dampers A & B closed
- D. Blow-in door open, damper D open, dampers A & B closed, and damper C throttled

Answer: D

Explanation/Justification:

At Indian Point Unit 3 the Fan Cooler Unit (FCU) speed does not change on a safety injection. Dampers on the FCUs change position to reduce the total flow rate through the unit. Some air is diverted through filters. Cooling water is increased to the FCU increasing the heat removal capability of the unit.

Blow-In Door Opens  
Damper D Opens  
Dampers A and B Close  
Damper C fails to a throttled position.

A. Incorrect

B. Incorrect

C. Incorrect

D. has the correct damper alignment.

Technical References:	Syst Desc 10.3
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-VCCARC 2
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Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	026000A401	
		Ability to manually operate and/or monitor in the control room: - CSS controls	
	Importance	4.5	4.3

Question # 41

During I&C testing an operator incorrectly simultaneously depressed both of the manual containment spray actuation pushbuttons. Which one of the following correctly describes the results of this action?

- A. Main Steam Line Isolation, VC Spray actuation, and Phase B actuation
- B. VC Spray Actuation, Phase B actuation, Containment Ventilation Isolation actuation.
- C. SI Actuation, VC Spray actuation, Containment Ventilation Isolation
- D. VC Spray actuation, Phase B actuation, SI Actuation

Answer: B

Explanation/Justification:

- A. Incorrect. Plausible because an Automatic Containment Spray Signal will generate these signals. A manual signal will not result in Steam Line Isolation,
- B. Correct. These are the only signals generated directly from a manual spray signal.
- C. Incorrect. Plausible because an Automatic Containment Spray Signal will all of these signal (plus a Phase B), but a manual signal will not generate an SI Actuation.
- D. Incorrect, Plausible because an Automatic spray signal will generate these signals (plus CVI), but a manual signal will not generate an SI Actuation.

Technical References:	Drawing
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-ESS001 3
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Question Source:	Modified
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	0260002406	
		Emergency Procedures/Plan - Knowledge of EOP mitigation strategies.	
	Importance	3.7	4.7

Question # 42

The plant has experienced a small break LOCA. During the performance of E-1, Loss of Reactor or Secondary Coolant, cold leg recirculation capability could not be verified. The control room team then transitioned to ECA-1.1, Loss of Emergency Coolant Recirculation. Given the following plant conditions:

- Containment pressure is 23 psig and slowly decreasing
- RWST Level is 10.5 feet and slowly decreasing
- 4 CNMT Fan Coolers are running in Emergency Mode
- 2 CNMT Spray Pumps are running

Which of the following actions is required, with respect to the Containment Spray Pumps/Containment Cooling System?

- Secure one Containment Spray Pump, place it in AUTO, and add makeup to the RWST.
- Secure both Containment Spray pumps, and place them in TPO, and throttle SI flow.
- Continue to run both Containment Spray Pumps, add makeup to the RWST, and throttle SI flow.
- Secure one Containment Spray Pump, place it in TPO, and add makeup to the RWST.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because for these conditions one spray pump is secured. It is NOT placed in AUTO. Makeup to the RWST is correct too.

B. Incorrect. Plausible because one of the strategies of ECA-1.1 is to reserve as much inventory for core cooling as possible. Containment Cooling requirements are relaxed in ECA-1.1, but to secure both pumps still requires 5 Fan Cooler Units in operation.

C. Incorrect. Plausible because containment pressure is greater than auto actuation setpoint with less than 5 fan cooler units running.

D. Correct.

Technical References: 3-ECA-1.1

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPC10 3

Question Source: Bank

Question History: NA

Question Cognitive Level: Synthesis Evaluation

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	039000K505	
		Knowledge of the operational implications of the following concepts as they apply to the MRSS: - Bases for RCS cooldown limits	
	Importance	2.7	3.1

#### Question # 43

Given:

- The Unit is operating at 100% power with all systems in automatic
- R-15 is inoperable.
- R-19 is in alarm.
- Chemistry sampling confirms an 80 gpd SG tube leak on 31 SG.
- Reactor was shutdown in accordance with 3-AOP-RSD-1, Rapid Shutdown.
- CRS directed initiation of a 100°F/hr cooldown

Assuming the leak rate remains constant, which of the following describes how the cooldown is accomplished in 3-AOP-SG-1 and basis for this cooldown rate?

- All MSIVs are closed and atmospheric steam dumps are used for cooldown.  
Basis for C/D rate is to maintain Pressurizer inventory on scale to prevent manual SI
- 31 MSIV is closed and high pressure steam dumps are used for cooldown.  
Basis for C/D rate is to maintain margin to brittle failure to the reactor vessel and piping.
- All MSIVs are closed and atmospheric steam dumps are used for cooldown.  
Basis for C/D rate is to maintain margin to brittle failure to the reactor vessel and piping.
- 31 MSIV is closed and high pressure steam dumps are used for cooldown.  
Basis for C/D rate is to maintain Pressurizer inventory on scale to prevent manual SI

Answer: B

Explanation/Justification:

Duplicated from question no 26608

The cooldown in AOP-SG-1 is performed using Attachment 4. The maximum allowed cooldown rate is the Tech Spec value (100°F/hr) and the basis is the TS basis.

A. Incorrect. Plausible because all MSIVs could be closed if the turbine does not trip. Also efforts to prevent SI are plausible; however, the leak is small enough that an SI would not be necessary.

B. Correct. Only the affected MSIV is closed and limits of POP cooldown rate are used.

C. Incorrect. Plausible because all MSIVs could be closed if the turbine does not trip. Also margin to brittle failure is correct.

D. Incorrect. Plausible because only the affected MSIV is closed; however, the leak is small enough that an SI should not be necessary.

Technical References: 3-AOP-SG-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-POP002 3

Question Source: New

Question History: Unit 2 NRC 2016

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	059000K304	
		Knowledge of the effect that a loss or malfunction of the MFW System will have on the following: - RCS	
	Importance	3.6	3.8

Question # 44

Given:

- The plant is operating at 30% power.
- 31 MBFP is in service in Automatic
- 32 MBFP is in standby.
- Preparations are in progress to transfer from Low Flow Bypass Feed Regulating Valves (LFBV) to Main Feed Regulating Valves (MFRV).
- PT-408A Main Boiler Feed Pump (MBFP) Discharge pressure failed low.

Which of the following describes the effect on the plant and what actions are necessary per the abnormal operating procedure?

	RCS Temp	Action
A.	Decrease	Take Manual Control 31 MBFP to control $\Delta P$
B.	Increase	Take Manual Control 31 MBFP to control $\Delta P$
C.	Decrease	Trip Reactor then Trip 31 MBFP
D.	Increase	Trip Reactor then Trip 31 MBFP

Answer: A

Explanation/Justification:

Duplicated from question 26529

A. Correct. Discharge pressure failing low will cause MBFP speed to increase. Since LFBVs are in service, SG level will increase. The increase in level will cause a decrease in RCS temperature. Taking man control of the MBFP is correct action

B. Incorrect. Plausible because if the MBFP slowed down this response would be correct. Taking man control of the MBFP is correct action

C. Incorrect. Plausible because the MBFP speed would increase and SG level would increase;and RCS temp would decrease. Tripping the Reactor would be correct if the failure cause the MBFP to slow down to minimum speed and manual control was not effective.

D. Incorrect. Plausible because if the MBFP slowed down this response would be correct. Tripping the Reactor would be correct if the failure cause the MBFP to slow down to minimum speed and manual control was not effective. .

Technical References:	3-AOP-INST-1
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-AOPINT 32
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Question Source:	Modified
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Question History:	Unit 2 NRC 2014
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 5
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	061000K502	
		Knowledge of the operational implications of the following concepts as they apply to the AFW System: - Decay heat sources and magnitude	
	Importance	3.2	3.6

Question # 45

Unit 3 tripped from 100% power.

15 minutes post trip:

- The team is in ES-0.1, Reactor Trip Response, Step 8
- Both motor driven AFW pumps auto-started following the trip as expected.
- SG levels are not on scale.
- SI is not actuated or required

AFW flow of greater than \_\_\_\_\_(1)\_\_\_\_\_ is required to \_\_\_\_\_(2)\_\_\_\_\_.

- A. (1) 365 gpm  
(2) Support Loss of Feed Analysis
- B. (1) 686 gpm  
(2) Support Loss of Feed Analysis
- C. (1) 365 gpm  
(2) Remove decay heat
- D. (1) 686 gpm  
(2) Remove decay heat

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because 365 is correct; however it is not the correct value to support Loss of Feed Analysis.

B. Incorrect. Plausible because 686 is the correct value to exit E-0 at step 4. Step 1 of ES-0.1 allows throttling AFW to 365 until SG levels > 9%.

C. Correct.

D. Incorrect. Plausible because 686 is the correct value to exit E-0 at step 4. Step 1 of ES-0.1 allows throttling AFW to 365 until SG levels > 9%. Removing decay heat is correct.

Technical References: Syst Desc 21.2

Proposed References to be provided: None

Learning Objective I3LP-ILO-AFW001 5

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	062000K406	
		Knowledge of A.C. Distribution System design feature(s) and/or interlock(s) which provide for the following: - One-line diagram of 6.9kV distribution, including sources of normal and alternative power	
	Importance	2.9	3.3

#### Question # 46

A sudden grid disturbance caused a loss of 138KV power to Units 2 and 3. Both units remained online. 25 minutes later, the following conditions exist:

- The source of the disturbance has been identified and isolated.
- Feeder 95331 is expected to remain out of service for several hours.
- All other equipment is in the expected status for these conditions.
- Unit 3 plans on restoring normal offsite power per applicable procedures.

Which of the following describes power restoration for Unit 3?

- Power can be restored using 138KV power from Feeder 95332 via breakers:
  - BT4-5
  - BT5-6
  - Bus 5 and 6 Normal Feed Breakers
- Power can be restored using 138KV power from Feeder 95332 via breakers:
  - BT4-5
  - BT5-6
  - GT35 and GT36
- Power can be restored using 138KV power from GT 13.8KV bus 3A via breakers:
  - F3-1
  - GT-BT
  - Bus 5 and 6 Normal Feed Breakers
- Power can be restored using 138KV power from GT 13.8KV bus 3A via breakers:
  - F3-1
  - GT-BT
  - GT35 and GT36

Answer: A

Explanation/Justification:

Duplicated from question no 26596  
Give Reference 9321-F-33853

A. Correct.

B. Incorrect. Plausible because GT35 and GT36 can supply buses 5 and 6; however they cannot be supplied from 95332.

C. Incorrect. Plausible because can supply power to buses 5 and 6; however the breaker flow is not correct.

D. Incorrect. Plausible because can supply power to buses 5 and 6; however the breaker flow is not correct.

Technical References:	2-AOP-138KV-1 Tech Specs 9321-F-33853
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Proposed References to be provided:	Drawing 9321-F-33853
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Learning Objective	I2LP-ILO-AOP138 4
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 2
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	062000A216	
		Ability to (a) predict the impacts of the following malfunctions or operations on the A.C. Distribution System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Degraded system voltages	
	Importance	2.5	2.9

#### Question # 47

Given:

An inadvertent SI occurred.

SI was just reset.

Grid voltage just degraded such that 480V busses are 415V and stable.

Which of the following describes the effect of this condition continuing?

- A. In 36 seconds:
  - The normal supply breakers for 480V busses will open and busses are re-energized by EDGs.
  - Containment Fan Cooler Units will have to be manually restarted.
- B. In 2 seconds:
  - The normal supply breakers for 480V busses will open and busses are re-energized by EDGs.
  - Containment Fan Cooler Units will have to be manually restarted.
- C. In 36 seconds:
  - The normal supply breakers for 480V busses will open and busses are re-energized by EDGs.
  - Containment Fan Cooler Units will automatically restart.
- D. In 2 seconds:
  - The normal supply breakers for 480V busses will open and busses are re-energized by EDGs.
  - Containment Fan Cooler Units will automatically restart.

Answer: A

Explanation/Justification:

Degraded grid voltage is set at approximately 88% of nominal. This condition will actuate 1 of 2 timers. If no SI is present and voltage remains low for 36 seconds, the bus normal supply breaker is tripped. If an SI signal is present with degraded voltage for 2 seconds, the bus normal supply breaker is tripped. For this question, the SI signal for the Degraded voltage timer is reset when SI was reset. Thus no automatic start signal exists and equipment must be manually started.

A. Correct.

B. Incorrect. Plausible because 2 second timer is correct if an SI signal existed. Also •  
Containment Fan Cooler Units will need to be started.

C. Incorrect. Plausible because 36 second timer is correct; however, the • Containment  
Fan Cooler Units will have to be started.

D. Incorrect. Plausible because 2 second timer is correct if an SI signal existed. The •  
Containment Fan Cooler Units will have to be started.

Technical References:

Drawing  
Syst Desc 27.4

Proposed References to be provided:

None

Learning Objective

I3LP-ILO-EDS480 6

Question Source:

New

Question History:

NA

Question Cognitive Level:

Comprehension

10 CRF Part 55 Content:

55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	063000K201	
		Knowledge of bus power supplies to the following: - Major DC loads	
	Importance	2.9	3.1

Question # 48

Which one of the following will occur if the main feed breaker trips open on 125VDC Distribution Panel 31 with the unit at 100% power?

- A. No control reaction. The panel shifts automatically to the alternate source.
- B. Two Feedwater Regulating Valves fails CLOSED, resulting in a reactor trip on SG level.
- C. The reactor trips immediately due to the Reactor Trip Breaker UV coil de-energizing.
- D. The reactor trips immediately when the breakers for 32 and 33 RCPs trip OPEN.

Answer: C

Explanation/Justification:

Duplicated from question no 17278

A. Incorrect. Plausible because some electrical distribution systems have automatic transfer switches; however DC Distribution Panel 31 does not have an ABT switch.

B. Incorrect. Plausible because 2 FRVs will fail closed. The reactor will trip due to de-energizing the UV Coil.

C. Correct.

D. Incorrect. Plausible because 32 and 33 RCP breakers lose control power; however, the breakers do not trip.

Technical References:	3-AOP-DC-1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-EDS125 11
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Question Source:	Modified
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	063000A403	
		Ability to manually operate and/or monitor in the control room: - Battery discharge rate	
	Importance	3	3.1

#### Question # 49

Given:

- A grid disturbance has resulted in a unit trip with a loss of 138 and 13.8 kV power
  - All three EDGs failed to start.
  - Power restoration is expected to take 1.5 hours
  - Which of the following identifies justification for procedural actions (if any)?
- A. Station Batteries 31 – 34 are sized to carry expected shutdown loads for 2 hours without terminal voltage falling below 105 V.  
Deep Load Shed per FSG is NOT required.
- B. Station Batteries 31 – 34 are sized to carry expected shutdown loads for 8 hours without terminal voltage falling below 105 V.  
Deep Load Shed per FSG is NOT required.
- C. Station Batteries 31 – 34 are sized to carry expected shutdown loads for 2 hours without terminal voltage falling below 105 V.  
Deep Load Shed per FSG is required.
- D. Station Batteries 31 – 34 are sized to carry expected shutdown loads for 8 hours without terminal voltage falling below 105 V.  
Deep Load Shed per FSG is required.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the batteries are designed to carry expected shutdown loads for 2 hours; however, since power restoration is not expected for greater than one hour, the Deep Load Shed is required.

B. Incorrect. Plausible because batteries are expected to carry REDUCED loads for 8 hours after Deep Load Shed. In addition Deep Load Shed is required.

C. Correct. Plausible because the batteries are designed to carry expected shutdown loads for 2 hours, and since power restoration is not expected for greater than one hour, the Deep Load Shed is required.

D. Plausible because batteries are expected to carry REDUCED loads for 8 hours after Deep Load Shed. In addition Deep Load Shed is required.

Technical References:	0-FSG-004 FSAR Tech Specs
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Proposed References to be provided:	None
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Learning Objective	I3LP-ILO-EOPC00 4
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	064000K402	
		Knowledge of ED/G System design feature(s) and/or interlock(s) which provide for the following: - Trips for ED/G while operating (normal or emergency)	
	Importance	3.9	4.2

Question # 50

Fill in the missing information:

During the Emergency Diesel Generator (EDG) starting sequence, the Overcrank Timer will Shutdown the EDG after \_\_\_\_\_ seconds unless \_\_\_\_\_ .

- A. 8; lube oil pressure is sensed
- B. 8; jacket water pressure is sensed
- C. 15; lube oil pressure is sensed
- D. 15; jacket water pressure is sensed

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because the Overcrank setpoint is 8 psig jacket water pressure in 15 seconds. The EDG will also trip on low lube oil pressure but this is not part of the Overcrank Timer shutdown.

B. Incorrect. Plausible because the Overcrank setpoint is 8 psig jacket water pressure in 15 seconds.

C. Incorrect. Plausible because the Overcrank setpoint is 8 psig jacket water pressure in 15 seconds. The EDG will also trip on low lube oil pressure but this is not part of the Overcrank Timer shutdown.

D. Correct

Technical References: Syst Desc 27.3

Proposed References to be provided: None

Learning Objective I3LP-ILO-EDSEDG 6

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	073000K101	
		Knowledge of the physical connections and/or cause-effect relationships between the PRM System and the following systems: - Those systems served by PRMs	
	Importance	3.6	3.9

Question # 51

Consider the following Unit 3 Process Radiation Monitors:

1. R-15 Air Ejector Gas Monitor
2. R-17 Component Cooling Water Monitor
3. R-56C Sewage Transfer System Liquid Monitor
4. R-61 Condensate Polisher Overboard Monitor

When in the alarm condition, which of the above will cause an automatic action to occur?

- A. 1, 2, and 3
- B. 1, 2, and 4
- C. 1, 3, and 4
- D. 2, 3, and 4

Answer: C

Explanation/Justification:

1. R-15 is a correct selection. It will shift air ejector exhaust to containment and starts the blower.
2. R-17 is not correct. Original plant design had this monitor close RCV-017. This is disabled.
3. R-56C is a correct selection. It will shift sewage waste to the collection tank.
- 4 R-61 is a correct selection. It will terminate the discharge to the river.

A. Incorrect.

B. Incorrect.

C. Correct.

D, Incorrect.

Technical References: 3-SOP-RM-010

Proposed References to be provided: None

Learning Objective I3LP-ILO-RMSPRM 4

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 11

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	076000A302	
		Ability to monitor automatic operation of the SWS, including: - Emergency heat loads	
	Importance	3.7	3.7

#### Question # 52

Unit 3 Essential Service Water is selected to the 4, 5, 6 header. Header pressure is 72 psig and lowering.

Which of the following is a possible component location for this leak?

- A. H2 Dryers
- B. Component Cooling Water Heat Exchangers
- C. Seal Oil Coolers
- D. Iso-Phase Bus Coolers

Answer: C

Explanation/Justification:

- A. Incorrect. H2 Dryers are on the Non-Essential Cooling Header
- B. Incorrect. CCW Heat Exchangers are on the Non-Essential Cooling Header
- C. Correct.
- D. Incorrect. Iso-Phase Bus Coolers are on the Non-Essential Cooling Header.

Technical References:	Syst Desc 24
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-SW001 1
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	078000K201	
		Knowledge of bus power supplies to the following: - Instrument air compressor	
	Importance	2.7	2.9

Question # 53

Given:

- An area wide blackout has occurred.
- Bus 2A normal feed breaker tripped on overcurrent.
- Buses 5A and 6A are energized from their EDGs.
- MCCs 37 and 39 have been aligned and reset per SOP-EL-15.
- In response to the event, the cross connect with Unit 2 air systems was closed.
- All other systems functioned as designed.

Which of the following identifies the air compressors that should be running?

	31 IA	32 IA	33 IA
A.	Yes	No	No
B.	Yes	Yes	No
C.	No	Yes	Yes
D.	No	No	Yes

Answer: A

Explanation/Justification:

Power Supplies for the air compressors are:

31 IA MCC-39 from bus 5A (Energized for question and compressor would have auto started)

32 IA MCC-34 from bus 2A (De-energized for question)

33 IA MCC 33 from bus 2A (De-energized for question)

Level of difficulty is greater than 1. Candidate must know power supplies and that air compressors are aligned to restart when power is restored from EDG (MCCs Reset).

A. Correct

B. Incorrect

C. Incorrect

D. Incorrect

Technical References: 3-SOP-EL-015

Proposed References to be provided: None

Learning Objective I3LP-ILO-SA001 3  
I3LP-ILO-IA001 3

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	103000A203	
		Ability to (a) predict the impacts of the following malfunctions or operations on the Containment System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Phase A and B isolation	
	Importance	3.5	3.8

Question # 54

3-PT-Q027, CNMT Isolation Valves PCV-1234, 1235, 1236, and 1237 Stroke Test, was just performed with the following results for PCV-1234 and PCV-1235:

Valve	SR 3.6.3.5 Requirement	IST Program Requirement	Actual Result
PCV-1234	$\leq 42$ sec	$1 \leq \text{sec} \leq 3$	2 sec
PCV-1235	$\leq 42$ sec	$1 \leq \text{sec} \leq 3$	4 sec

Based on these results, what is a correct action to be taken in accordance with 3-PT-Q021?

- A. PCV-1235 SHALL be declared inoperable. No further action required since PCV-1234 is operable.
- B. PCV-1235 SHALL be declared inoperable. Deactivate either PCV-1214 or PCV-1234.
- C. PCV-1235 may remain operable. Perform additional strokes of PCV-1235 per an attachment in 3-PT-Q027.
- D. PCV-1235 may remain operable for up to 96 hours. DO NOT retest PCV-1235 until evaluated by IST Program Engineer.

Answer: C

Explanation/Justification:

The valve could be declared inoperable for failing the IST program, however this is not required. 3-PT-Q027 (and other valve tests) were revised in 2015 to specify that the valve is immediately retested or declared inoperable. The likely choice and only completely correct response is to retest the valve. These valves are Phase A CIVs.

A. Incorrect but plausible. It is plausible that the valve would be inoperable. Since PCV-1235 is operable that no additional action would be required.

B. Incorrect but plausible. It is plausible that the valve would be inoperable. It is plausible that action would be needed to keep the line isolated even with another failure.

C. Correct answer.

D. Incorrect but plausible. The 96 hour value is in the acceptance criteria for the valve remaining operable if the subsequent IST test fails. It is plausible that the retest would have to wait since we do not retest a valve that fails the TS requirements.

Technical References: 3-PT-Q027

Proposed References to be provided: None

Learning Objective I3LP-ILO-MFW002 5  
I3LP-ILO-MFW002 9

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	103000A301	
		Ability to monitor automatic operation of the Containment System, including: - Containment isolation	
	Importance	3.9	4.2

Question # 55

Given:

- An event occurred
- Only Train A of Safety Injection actuated.

Which of the following describes the effect this will have on Phase A and Containment Ventilation Isolation>?

- Both Train A and B of Phase A will actuate.  
Only Train A of Containment Ventilation Isolation will actuate.
- Only Train A of Phase A will actuate.  
Only Train A of Containment Ventilation Isolation will actuate.
- Both Train A and B of Phase A will actuate.  
Both Train A and B of Containment Ventilation Isolation will actuate.
- Only Train A of Phase A will actuate.  
Both Train A and B of Containment Ventilation Isolation will actuate.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because MANUAL actuation of either train of Phase A will actuate both trains of Phase A. It is true that only Train A of Phase A will actuate.

B. Correct.

C. Incorrect. Plausible because MANUAL actuation of either train of Phase A will actuate both trains of Phase A and both trains of CVI.

D. Incorrect. Plausible because only Train A of phase A will actuate; however both trains of CVI will not actuate.

Technical References:	Drawing
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-ESS001 3
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	001000K602	
		Knowledge of the effect of a loss or malfunction on the following CRDS components: - Purpose and operation of sensors feeding into the CRDS	
	Importance	2.8	3.3

Question # 56

With the rod control system in automatic at 100% power, which ONE of the following describes the Control Rod system response for the given instrument failures? Consider each instrument failure separately and as if it occurred instantaneously

	<u>One Loop Tcold fails High</u>	<u>NIS N41 fails High</u>
A.	rods move in	no rod movement
B.	no rod movement	rods move in
C.	rods move in	rods move in
D.	no rod movement	no rod movement

Answer: C

Explanation/Justification:

An interlock exists that prevents rod withdrawal for temperature failures low. Similarly, a rapid failure low on an NIS channel will cause a dropped rod rod stop (no rod motion).

A. Incorrect. Plausible because rods do move in for Tcold failure but the rods also move in for a NIS failure (rod stop occurs on a rapid failure low).

B. Incorrect. Plausible because no rod motion is correct for a failure LOW and the rods do move in for an NIS failure High.

C. Correct.

D. Incorrect. Plausible because would not move for a Tcold failure LOW or and NIS rapid failure LOW

Technical References: 3-AOP-INST-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-ICROD 10  
I3LP-ILO-ICROD 15  
I3LP-ILO-ICROD 8  
I3LP-ILO-ICROD 9

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	002000K101	
		Knowledge of the physical connections and/or cause-effect relationships between the RCS and the following systems: - RWST	
	Importance	3.7	3.9

Question # 57

An INTERLOCK between the Residual Heat Removal Pump Normal Loop Suction Valves 730 & 731, and valves 888A & 888B Low Head to High Head SI Recirc Isolation, prevents?

- A. Pumping the Reactor Coolant System to the Refueling Water Storage Tank.
- B. Pumping the RECIRC Sump to the Refueling Water Storage Tank.
- C. Draining the Reactor Coolant System to the VC Sump.
- D. Draining the Refueling Water Storage Tank to the VC Sump.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Plausible because pumping the Recirc Sump to the RWST is not desired; however no interlock exists to prevent this.

C. Incorrect. Plausible because an interlock exists between 730/731 and 885A/B to prevent this.

D. Incorrect. Plausible because draining the RWST to the VC Sump is not desired; however, no interlock exists to prevent this.

Technical References: Syst Desc 4.2

Proposed References to be provided: None

Learning Objective I3LP-ILO-RHR001 6

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	011000K101	
		Knowledge of the physical connections and/or cause-effect relationships between the PZR LCS and the following systems: - CVCS	
	Importance	3.6	3.9

#### Question # 58

Given:

- The plant is at 100% power
- All control systems are in automatic.
- Pressurizer Level Defeat switch (L 460A) is in Defeat 3
- One charging pump is running in automatic
- Pressurizer level channel LT-459 (Channel 1) failed low

Which ONE of the following is the expected plant response in the first two minutes of the event?

- All Pressurizer heaters deenergize. Letdown Isolation valve (LCV-459) closes.
- All Pressurizer heaters deenergize. Letdown Isolation valve (LCV-460) closes.
- Charging pump speed increases. Letdown Isolation valve (LCV-459) closes.
- Charging pump speed increases. Letdown Isolation valve (LCV-460) closes.

Answer: B

Explanation/Justification:

In Defeat 3 Channel 1 (LT-459) is in alarm and Channel 2 (LT-460) is in control. LCV-459 is controlled from the control channel. Pressurizer heaters will deenergize on a low level on either control or alarm channels.

- A. Incorrect. Plausible because pressurizer heaters will deenergize, but LCV-459 will not close
- B. Correct.
- C. Charging pump speed is controlled by LT 460 – so charging pump speed will decrease due to actual level increasing. Also LCV 460 will close.
- D. Charging pump speed is controlled by LT 460 – so charging pump speed will decrease due to actual level increasing. Also LCV 460 will close.

Technical References:	3-AOP-INST-1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-ICPZLV 11
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Question Source:	Modified
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	017000K502	
		Knowledge of the operational implications of the following concepts as they apply to the ITM System: - Saturation and subcooling of water	
	Importance	3.7	4

Question # 59

Given:

- The control room operators are responding to a Steam Generator Tube Rupture with a loss of reactor coolant using ECA-3.1, SGTR With a LOCA Subcooled Recovery Desired.
- While checking if one Safety Injection pump can be stopped, the following conditions are found to exist:
  - Containment temperature is 175°F
  - Three SI pumps running
  - One RCP running
  - RCS Pressure is 565 psig
  - CETs indicate 415°F
  - Two charging pumps are running
  - PZR level is 52 %
  - No RHR pumps are running
  - RCS hot leg temperatures indicate 400°F

The control room operators should:

- A. Stop one SI pump.
- B. Stop one Charging pump.
- C. Start one RHR pump.
- D. Stop the running RCP.

Answer: A

Explanation/Justification:

- A. Correct. Adequate subcooling exists to secure the first SI pump per ECA-3.1.
- B. Incorrect. Plausible because Pressurizer Level will need to be controlled, and securing a charging pump will aid in stopping pressurizer level rise.
- C. Incorrect. Plausible because starting an RHR pump is performed if inadequate subcooling exists to secure an SI pump.
- D. Incorrect. Plausible because subcooling is the RCP trip criteria for small break LOCA conditions; however, RCP trip criteria no longer apply at this time in the procedure.

Technical References: 3-ECA-3.1

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPC30 3

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	027000A201	
		Ability to (a) predict the impacts of the following malfunctions or operations on the CIRS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - High temperature in the filter system	
	Importance	3	3.3

#### Question # 60

Given:

- A Reactor Trip and Safety Injection occurred from 100% power due to a large break LOCA
- During the performance of E-1, Loss of Reactor or Secondary Coolant, annunciator FAN 31 CARBON FILTER HIGH TEMP illuminates

Which of the following describe the consequences of and actions for the 31 Fan Cooler Unit (FCU) high temperature alarm?

- Charcoal filter housing deformation/restricted flow.  
Cool/Extinguish using filter dousing from High Head SI.
- Charcoal filter housing deformation/restricted flow.  
Cool/Extinguish using filter dousing from Containment Spray.
- Fire in the charcoal filter re-releasing iodine to atmosphere.  
Cool/Extinguish using filter dousing from High Head SI.
- Fire in the charcoal filter re-releasing iodine to atmosphere.  
Cool/Extinguish using filter dousing from Containment Spray.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because flow through the FCUs is important during accident conditions; however if a fire occurs the FCU is secured. Also filter dousing comes from Containment Spray not HHSI.

B. Incorrect. . Plausible because flow through the FCUs is important during accident conditions; however if a fire occurs the FCU is secured. Also filter dousing comes from Containment Spray.

C. Incorrect. Plausible because a fire re-releasing of iodine is true; however, dousing water is from CS not HHSI.

D. Correct.

Technical References: 3-ARP-015

Proposed References to be provided: None

Learning Objective I3LP-ILO-CS001 1

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	033000A202	
		Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of SFPCS	
	Importance	2.7	3

#### Question # 61

Given:

- The unit is at 100% power
- SPENT FUEL PIT HIGH TEMP, just actuated
- The NPO reports the thermal overload on 31 SFP Cooling Pump is tripped
- 32 SFP Cooling Pump is disassembled for maintenance

Which one of the following describes the general process for cooling the fuel assemblies in the Spent Fuel Pit (SFP)?

- Initiate bleed and feed by alternately draining from the SFP and then adding from Primary Water.
- Establish natural convection flow by maintaining the valves fully open on 31 SFP Cooling Pump and maximize CCW flow through the heat exchanger
- Maximize FSB ventilation flow, allow the SFP to heatup and makeup as necessary from Primary Water
- Manually align a recirculation flowpath from the SFP via the Refueling Water Purification Pump to the RWST and back to the SFP

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because if this was possible, it would work; however, there are no drains on the SPF.

B. Incorrect. Plausible because this would work if configured differently. The suction for the pump is at approximately 88' elevation and the HX is at 55'.

C. Correct.

D. Incorrect. Plausible because RWST purification loop uses the Spent Fuel Pit demineralizer and could makeup to the SFP; however, water cannot be removed from the SFP using the RWST Purification Pump.

Technical References: 3-AOP-SF-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-SFP001 8

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	034000K401	
		Knowledge of Fuel Handling System design feature(s) and/or interlock(s) which provide for the following: - Fuel protection from binding and dropping	
	Importance	2.6	3.4

Question # 62

While withdrawing a fuel assembly from the core, an electrical short causes a disengage signal to be sent to the gripper:

- A. The gripper will not disengage unless there is also a loss of air.
- B. The gripper will disengage if the hoist is in the core circle or upender/RCCA change zones.
- C. The gripper will not disengage as long as the fuel assembly weight is bearing on the gripper latch mechanism.
- D. The gripper will disengage if the Interlock Override keyswitch is in the bypass position.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the gripper is engaged/disengaged using air applied to a piston; however, the gripper fails as is on a loss of air.

B. Incorrect. Plausible because this describes a gripper hoist down interlock not a gripper disengage interlock.

C. Correct.

D. Incorrect. Plausible because the Interlock Override keyswitch bypass all gripper interlocks except the mechanical interlock.

Technical References: Syst Desc 17

Proposed References to be provided: None

Learning Objective I2LP-ILO-FHD001 9

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	041000A402	
		Ability to manually operate and/or monitor in the control room: - Cooldown valves	
	Importance	2.7	2.9

Question # 63

Given:

- A unit trip has occurred.
- The ATC has placed PC-404, Condenser Steam Dump controller in manual.

Which of the following describes the operation of the Steam Dumps system for these conditions?

- The Turbine Trip signal places Steam Dump in Pressure Mode and the valves will respond to signals from the PC-404.
- The Steam Dump Valves will immediately open/close based on existing signal from the PC-404.
- The Loss of Load interlock must be reset for the valves to respond to signals from the PC-404.
- The mode selector switch must be placed in Pressure Control for the valves to respond to signals from the PC-404.

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible because a turbine trip signal changes operation from Tavg – Tref deviation to Tavg – No Load Tavg (547°); however, this does not cause the mode to shift to Pressure Control
- B. Incorrect. Plausible because this is what would happen for most controllers; however, PC-404 is not in the control circuit unless mode selector switch is in pressure control.
- C. Incorrect. Plausible because procedurally we select reset prior to placing the switch in pressure mode (not physically required) and taking mode switch to pressure control is required.
- D. Correct.

Technical References:	Drawing
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-SDS001 3
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	072000A101	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ARM system controls including: - Radiation levels	
	Importance	3.4	3.6

Question # 64

Unit 2 is experiencing a SGTR with significant failed fuel. The wind is from the North.

Which of the following is true for Control Room Radiation Monitors?

- R-1 Control Room Area Radiation Monitor
  - R-33 Control Room Gas Process Radiation Monitor
- 
- A. R-1 in Alarm – Automatically switches control room ventilation to 10% incident mode.  
R-33 in Alarm – Automatically switches control room ventilation to 10% Incident Mode.
- B. R-1 in Alarm – Manually switch control room ventilation to 10% incident mode.  
R-33 in Alarm – Automatically switches control room ventilation to 10% Incident Mode.
- C. R-1 in Alarm – Automatically switches control room ventilation to 10% incident mode.  
R-33 in alarm – Manually switch control room ventilation to 10% Incident Mode.
- D. R-1 in Alarm – Manually switch control room ventilation to 10% incident mode.  
R-33 in alarm – Manually switch control room ventilation to 10% Incident Mode.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because R-1 will auto transfer ventilation to 10% incident mode; however R-33 will not.

B. Incorrect. Plausible because in general automatic actions are associated with process radiation monitors not area radiation monitors. Control room radiation monitors are reversed. The Area radiation monitor (R-1) causes the auto action, and the process radiation monitor (R-33) does not.

C. Correct.

D. Incorrect. Plausible because one of the radiation monitor requires Manual action to swap ventilation to 10% incident mode.

Technical References:	3-SOP-RM-010
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-RMSARM 4
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 5
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	075000A203 Ability to (a) predict the impacts of the following malfunctions or operations on the Circulating Water System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Safety features and relationship between condenser vacuum, turbine trip, and steam dump	
	Importance	2.5	2.7

Question # 65

Given:

- The unit is operating a 100% power.
- Hudson River Water temperature is 86°
- A storm has resulted in debris in the Hudson River
- Fouling of the traveling water screens is increasing.
- Condenser Vacuum is 24 inches and lowering slowly.
- All Circulating Water Pumps are operating

Which of the following states the impact of these conditions?

- Both High Pressure and Low Pressure steam dumps will fail to operate if required.
- Low Pressure Steam Dumps will fail to operate; High Pressure Steam Dumps will operate in Steam Pressure Mode only
- Low Pressure Steam Dumps will operate; High Pressure Steam Dumps will fail to operate if required.
- Low Pressure Steam Dumps will operate; High Pressure Steam Dumps will not "trip open" they will modulate open only

Answer: C

Explanation/Justification:

This question meets this KA because the Hudson River/Circulating water system is the “heat sink” for the main turbine. Inadequate heat removal in the main condenser will result in decreased vacuum. The HP dumps are interlocked with condenser vacuum > 25”. There is no vacuum interlock for the LP dumps.

A. Incorrect. Plausible because the HP dumps will not operate with vacuum less than 25”. There is no interlock between LP dumps and vacuum.

B. Incorrect. Plausible because condenser vacuum is required for HP dumps though not for LP dumps.

C. Correct.

D. Incorrect. Plausible because LP dumps will operate and HP dumps will not function at all.

Technical References:	Syst Desc 18
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-SDSHP 6 I2LP-ILO-SDSLP 6 I3LP-ILO-AFW001 2
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Question Source:	Bank
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Question History:	Unit 2 NRC 2016
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012126	
		Conduct of Operations - Knowledge of non-nuclear safety procedures (e.g. rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen.	
	Importance	3.4	3.6

Question # 66

Which of the following correctly identifies the proper sequence of boundaries, established to provide protection for an individual from shock or flash, starting from any point on an exposed energized electrical conductor?

- A. Flash Protection Boundary, Restricted Approach Boundary, Limited Approach Boundary
- B. Restricted Approach Boundary, Limited Approach Boundary, Flash Protection Boundary
- C. Limited Approach Boundary, Flash Protection Boundary, Restricted Approach Boundary.
- D. Restricted Approach Boundary, Flash Protection Boundary, Limited Approach Boundary.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because the boundary names are correct. Candidate should know the proper sequence.

B. Correct.

C. Incorrect. Plausible because the boundary names are correct. Candidate should know the proper sequence.

D. Incorrect. Plausible because the boundary names are correct. Candidate should know the proper sequence.

Technical References: EN-IS-123

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Unit 2 NRC 2010

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012144	
		Conduct of Operations - Knowledge of RO duties in the CR during fuel handling, such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the CR in support of fueling operations, and supporting instrumentation.	
	Importance	3.9	3.8

Question # 67

Given:

- RCS Temperature is 112°
- RCS is at reduced inventory to reinstall the Reactor Head.
- An RHR suction line leak has resulted in a loss of both RHR pumps

The control room will alert personnel in Containment by actuating the Containment Evacuation Alarm from \_\_\_\_\_ and containment closure is required within \_\_\_\_\_ minutes.

- Radiation Monitor/Bantam 11 Cabinet; 30 minutes
- RO desk; 30 minutes
- Radiation Monitor/Bantam 11 Cabinet; 60 minutes
- RO Desk; 60 minutes

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because the Containment Evacuation Alarm is automatically sounded by R-11 and R-12. 30 minutes is the correct time.

B. Correct.

C. Incorrect. Plausible because the Containment Evacuation Alarm is automatically sounded by R-11 and R-12. 60 minutes is plausible when starting from low temperature.

D. Incorrect. Plausible because RO Desk is correct and 60 minutes is plausible when starting from low temperature.

Technical References: 3-AOP-RHR-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-AOPRHR 3

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012206	
		Equipment Control - Knowledge of the process for making changes to procedures.	
	Importance	3	3.6

Question # 68

In accordance with IP-SMM-AD-102, "IPEC Implementing Procedure Preparation, Review and Approval", which of the following would prevent changing a surveillance procedure using a temporary procedure change?

- A. Editorial change to correct attachment numbers.
- B. Changes are necessary due to a temporary plant condition.
- C. A change to less restrictive acceptance criteria.
- D. The procedure will be exited prior to completion.

Answer: C

Explanation/Justification:

There are 3 types of Temporary Procedure Changes, Advance, Conditional and Editorial. In addition, knowledge of "intent change" is necessary to answer this question.

- A. Incorrect. Plausible because the change will become permanent and not just remain "temporary".
- B. Incorrect. Plausible because an Advance Change TPC addresses conditions that will be made permanent. This specific condition is addressed by a Conditional TPC and is allowed.
- C. Correct. This condition is specifically identified as an Intent Change not allowed by the administrative procedure.
- D. Incorrect. Plausible because the necessity for a TPC may be questioned if the procedure will be exited before the actions of the TPC are completed.

Technical References:	IP-SMM-AD-102
Proposed References to be provided:	None

Learning Objective	I0WKB-ILO-ADM00 2.2.6
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Question Source:	Bank
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Question History:	Unit 2 NRC 2014
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group# K/A#	1940012218 Equipment Control - Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	
	Importance	2.6	3.9

Question # 69

During outage preparation, a planned maintenance activity will result in an ORANGE Key Safety Function status.

Which of the following complete the statements below?

Daily Risk Assessments are initiated once \_\_\_\_\_ (1) \_\_\_\_\_ is reached.

A Risk Management Contingency Plans is \_\_\_\_\_ (2) \_\_\_\_\_ for an ORANGE status condition.

- A. (1) MODE 3  
(2) NOT required
- B. (1) MODE 3  
(2) required
- C. (1) MODE 4  
(2) required
- D. (1) MODE 4  
(2) NOT required

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because candidate may believe the assessments are required when Reactor is subcritical and cooldown is initiated. Candidate may also believe Contingency Plan is required for any condition greater than YELLOW.

B. Incorrect. Plausible because candidate may believe the assessments are required when Reactor is subcritical and cooldown is initiated. Also Contingency Plan is required.

C. Correct.

D. Incorrect. Plausible because assessments are required in MODES 4, 5, and 6. Candidate may also believe. Candidate may also believe Contingency Plan is required for any condition greater than YELLOW.

Technical References:	EN-OU-108 IP-SMM-OU-104
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Proposed References to be provided:	None
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Learning Objective

Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012243	
		Equipment Control - Knowledge of the process used to track inoperable alarms.	
	Importance	3	3.3

Question # 70

An Annunciator has been declared a nuisance, what are the requirements to allow the alarm to be removed from service and any actions required?

- ARP actions taken
  - Logged in the Unit log
  - OUT OF SERVICE tag hung on alarm,
  - SM approval, AND
- A. Start Special Log, CR written if going to exceed 24 hours
- B. Start Special Log, CR written if going to exceed 48 hours
- C. Noted on CRS turnover sheet if not returned to service prior to turnover, CR written if going to exceed 24 hours
- D. Noted on CRS turnover sheet if not returned to service prior to turnover, CR written if going to exceed 48 hours

Answer: C

Explanation/Justification:

- A. Incorrect. Plausible because a special log could be used to track. Second part is correct.
- B. Incorrect. First part is correct. Plausible because 48 hours could be a time for the CR.
- C. Correct.
- D. Incorrect. Plausible because every condition is correct except 48 hours.

Technical References: OAP-115  
Proposed References to be provided: None

Learning Objective IOWKB-ILO-ADM00 2.2.43

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012312	
		Radiological Controls - Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	
	Importance	3.2	3.7

Question # 71

You are about to sign on to an RWP to operate a valve in the Reactor Coolant Filter Cell and notice there is no requirement to wear a respirator. You recall from your tour this morning that the cell is posted as a High Airborne Activity Area. You ask the HP tech about this and are told it is consistent with ALARA to NOT wear a respirator.

Why would NOT wearing a respirator in a High Airborne Activity Area be consistent with ALARA?

- A. The respirator is only effective on particulates so there will be NO difference in TEDE.
- B. The respirator will limit your vision and may be a safety hazard in "tight" spaces.
- C. Wearing a respirator may increase your stay time and actually increase TEDE.
- D. The Airborne Activity is short lived and the respirator will have NO impact on ALARA

Answer: C

Explanation/Justification:

This question was previously used on Oyster Creek Unit 1 ILO exam. The only modification is that the job location was changed to the RCS Filter Cell. The question meets the KA since it tests the principle of TEDE/ALARA vs. absolute minimizing internal exposure. The distracters are plausible if the candidate knowledge radioactivity and radiological controls is weak.

A. Incorrect

B. Incorrect

C. Correct

D. Incorrect

Technical References:

Proposed References to be provided: None

Learning Objective I0WKB-ILO-ADM00 1

Question Source: Bank

Question History: 2014

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 12

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012313	
		Radiological Controls - Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	
	Importance	3.4	3.8

#### Question # 72

Unit 3 is at 1% Reactor power coming out of a refueling outage.

Personnel are in containment making adjustments to 33 RCP vibration probes.

The CRS and SM decide they want to raise power to 2% in preparation for power ascension later that day.

Based on OAP-007, Containment Entry and Egress, what is required regarding this power ascension?

- A. Personnel working on the RCP vibration probes will have to move to the outer crane wall. When the power increase is complete the workers can return to the RCP.
- B. Power can be raised. Since the plant will remain in a mode below Mode 1 dose rate changes will be minimal, so the power ascension does not require additional action per OAP-007.
- C. Power can be raised. However, since there are personnel in the inner crane wall, OAP-007 requires the SM to specifically approve the power ascension.
- D. The RP Supervisor and entry party must be notified prior to any planned change in power level. The RP Supervisor will then decide if workers need to exit or move to ALARA area prior to raising power if necessary.

Answer: D

Explanation/Justification:

Duplicated from question no 24950

This situation actually occurred at IP3, which led to the procedural requirement.

A. Incorrect but plausible. It is not unreasonable that OAP-007 would have required removing personnel prior to power ascension, not just moving to outer crane wall.

B. Incorrect but plausible. It would be reasonable to assume that this power change would have minimal effect on dose rates, but this is not true.

C. Incorrect but plausible. The SM is often allowed to authorize items that require slightly greater levels of control and decision making. Based on B above discussion, it is reasonable that a candidate may assume this change will have minimal effect.

D. Correct based OAP-007 step 2.22

Technical References: OAP-007

Proposed References to be provided: None

Learning Objective I0LP-ILO-ADM01 4

Question Source: Modified

Question History: Unit 2 NRC 2010

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012414	
		Emergency Procedures/Plan - Knowledge of general guidelines for EOP usage.	
	Importance	3.8	4.5

### Question # 73

The STA has advised the SRO that an ORANGE path exists for CORE COOLING and no other higher ORANGE or RED paths exist.

While depressurizing the SGs to 175 psig IAW the procedure for ORANGE path on CORE COOLING, the STA reports that you are now in a RED path on the INTEGRITY CSF.

Which of the following describe the appropriate action to be taken?

- A. Complete the depressurization of all SGs to 175 psig, then transition to FR-P.1, Response to Imminent Pressurized Thermal Shock.
- B. Transition to FR-P.1, "RESPONSE TO IMMIENT PRESSURIZED THERMAL SHOCK".
- C. Complete FR-C.2, "RESPONSE TO DEGRADED CORE COOLING", then transition to FR-P.1, "RESPONSE TO IMMIENT PRESSURIZED THEMAL SHOCK".
- D. Continue with FR-C.2, Response to Degraded Core Cooling, and concurrently perform FR-P.1, Response to Imminent Pressurized Thermal Shock, that doesn't conflict with FR-C.2

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because a CAUTION directs the operators to “complete the procedure”. The candidates may believe they should complete the STEP then transition.

B. Incorrect. Plausible because in general when an ORANGE path procedure is in progress and a RED path condition occurs, the ORANGE procedure is suspended and the RED is implemented unless the procedure specifically states otherwise.

C. Correct. The CAUTION prior to the SG depressurization step specifically states to complete FR-C.2 before a transition to FR-P.1.

D. Incorrect. Plausible because some procedures (i.e., AOPs) can be performed concurrently with EOPs as long as the actions do not conflict with the EOP in progress.

Technical References: 3-FR-C.2

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFC2 4  
I2LP-ILO-EOPROU 21

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012435	
		Emergency Procedures/Plan - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	
	Importance	3.8	4

#### Question # 74

Which of the following describes the function and operation of the Charging Pump Alternate Feed Disconnect Switch (Bulldog Switch)?

- A. Disconnects 31 Charging Pump from Normal Power supply  
OFF to start 32 Charging Pump
- B. Disconnects 31 Charging Pump from Emergency Power supply  
OFF to start 32 Charging Pump
- C. Disconnects 32 Charging Pump from Normal Power supply  
ON to start 31 Charging Pump
- D. Disconnects 32 Charging Pump from Emergency Power supply  
ON to start 31 Charging Pump

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because the charging pump must be disconnected from the normal power supply; however this is accomplished using the Alternate Feed Transfer Switch. OFF is the correct position for the Bulldog Switch to start 32 charging pump.

B. Correct. The switch ensures 31 Charging Pump is disconnected from MCC-312A when operating 32 Charging Pump.

C. Incorrect. Plausible because the charging pump must be disconnected from the normal power supply; however this is accomplished using the Alternate Feed Transfer Switch. ON is the correct position to start 31 charging pump.

D. Incorrect. Plausible because 32 charging pump must be disconnected from the normal power supply; however this is accomplished using the Alternate Feed Transfer Switch. ON is the correct position to start 31 charging pump.

Technical References: 3-AOP-SSD-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-EDSAPR 4

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012442	
		Emergency Procedures/Plan - Knowledge of emergency response facilities.	
	Importance	2.6	3.8

#### Question # 75

Given:

- An emergency event is in progress
- A Site Area Emergency has been declared.
- Emergency Response Facilities have been declared Operational

Which of the following identified the location that you would direct the OFF-SHIFT NPOs to report?

- A. Control Room
- B. Operations Support Center
- C. Technical Support Center
- D. Site Assembly Area for evacuation

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because NPOs report to the Control Room and are dispatched from the control room for events SAE or GE.

B. Correct.

C. Incorrect. Plausible because the OSC and TSC at IPEC are in the same general area. Candidate must know the function of each facility to direct the NPOs to the correct location.

D. Incorrect. Plausible because Site Assembly area is non-essential personnel. This does not include qualified NPOs.

Technical References: IP-EP-210

Proposed References to be provided: None

Learning Objective IO LP-ILO-ERT001 1

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	0000262446 Emergency Procedures/Plan - Ability to verify that the alarms are consistent with the plant conditions.	
	Importance	4.2	4.2

Question # 76

The following conditions occurred at 100% power normal plant operations:

- T-0, the "RCP THERM BARRIER LOW  $\Delta P$ " alarm came in.
- T+1 minute, the "THERMAL BARRIER CCW HEADER LOW FLOW" alarm came in.
- T+2 minutes, the "RCP THERM BARRIER LOW  $\Delta P$ " alarm cleared.

Which of the following describes the event in progress and the correct procedure to address this event?

- A thermal barrier failure has occurred. AOP-LICCW-1, Leakage into CCW System, will direct opening AC-FCV-625 ONLY AFTER determining which thermal barrier has failed.
- A thermal barrier failure has occurred. AOP-LICCW-1, Leakage into CCW System, will direct opening AC-FCV-625 to determine which thermal barrier has failed.
- A spurious closure of AC-FCV-625 has occurred. ARP-10, Auxiliary Coolant System, will direct opening AC-FCV-625 ONLY AFTER checking FIC-625.
- A spurious closure of AC-FCV-625 has occurred. ARP-10, Auxiliary Coolant System, will direct opening AC-FCV-625 if it is determined that a thermal barrier was not leaking.

Answer: B

Explanation/Justification:

This question tests which alarm sequence would prompt/confirm a proper diagnoses of a loss of CCW cooling to RCP thermal barriers due to a leak. On a thermal barrier failure, seal injection directed into the RCS will flow into the lower pressure CCW system through the break. This will cause the RCP THERM BARRIER LOW  $\Delta P$  alarm. CCW return flow from the failed thermal barrier will increase until the trip setpoint for 625 auto-closure is reached. At this point, 625 will close causing thermal barrier return flow to decrease and bring up the THERMAL BARRIER CCW HEADER LOW FLOW alarm. Since seal injection water can no longer flow into CCW, it will return to normal flow into the RCS and the RCP THERM BARRIER LOW  $\Delta P$  alarm will clear. The procedure that addresses a thermal barrier failure is AOP-LICCW-1 which will direct opening 625 to determine which thermal barrier has failed.

A. Incorrect since the AOP will direct opening 625 to see which thermal barrier has failed. It is plausible that the procedure would not take steps that will actually re-initiate the leak.

B. Correct answer.

C. Incorrect. It is plausible that a spurious 625 closing would cause a perturbation that may bring up the RCP THERM BARRIER LOW  $\Delta P$  alarm. It is also possible that a student would have a misconception about what system  $\Delta P$  goes to this alarm. The second part of the response is also incorrect, but it is plausible that the ARP would not open the valve until flow was checked.

D Incorrect. It is plausible that a spurious 625 closing would cause a perturbation that may bring up the RCP THERM BARRIER LOW  $\Delta P$  alarm. It is also possible that a student would have a misconception about what system  $\Delta P$  goes to this alarm. The second part of the response is actually a correct statement based on the ARP.

Technical References:	3-AOP-LICCW-1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-AOPLIC 1
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Analysis Synthesis Evaluation
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	000027A211 Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: - RCS pressure	
	Importance	4	4.1

#### Question # 77

Given:

- IP3 is at 100% power.
- RC-PCV-455A (34 RCP Spray Valve) fails open slowly.
- PZR Pressure is lowering quickly but above reactor trip setpoint.
- The valve cannot be closed from the control room by any means.

In addition to tripping the reactor, what actions will be required and what procedure provides this guidance?

- A. Trip 34 RCP in accordance with AOP-INST-1, Instrument or Controller Failure.
- B. Trip 33 and 34 RCPs in accordance with AOP-INST-1, Instrument or Controller Failure.
- C. Trip 34 RCP in accordance with ARP-003, Reactor Coolant System.
- D. Trip 33 and 34 RCPs in accordance with ARP-003, Reactor Coolant System.

Answer: D

Explanation/Justification:

The guidance for a stuck open spray valve is located the ARP not the AOP. The ARP specifies tripping both 33 and 34 RCPs for either spray valve being open.

A. Incorrect but plausible. It is plausible that only the pump in the loop with the stuck valve would be tripped. It is plausible that since a bad controller is a likely cause of the event that AOP-INST-1 provides the guidance.

B. Incorrect but plausible. The first part is correct. It is plausible that since a bad controller is a likely cause of the event that AOP-INST-1 provides the guidance.

C. Incorrect but plausible. It is plausible that only the pump in the loop with the stuck valve would be tripped. The second part is correct.

D. Correct answer.

Technical References: 3-ARP-003

Proposed References to be provided: None

Learning Objective I3LP-ILO-ICPZPC 9

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	000029A202	
		Ability to determine and interpret the following as they apply to a ATWS: - Reactor trip alarm	
	Importance	4.2	4.4

#### Question # 78

The following events occurred over the past two minutes:

- The plant was at 100% power when a large grid disturbance occurred.
- The turbine experienced large load swings as a result.
- The ATC was directed to trip the reactor.
- The team is not sure if the turbine had tripped before the reactor was tripped.
- The team is certain that the reactor was tripped manually and prior to Breakers 1 and 3 opening.
- The blinking annunciator on Panel FDF (Reactor First Outs) is "TURBINE TRIP".

Which of the following indicates whether or not an Anticipate Transient without a Scram (ATWS) occurred and what (if any) E-Plan declarations are required?

- A. There was no ATWS. The "TURBINE TRIP" annunciator is blinking because this was the first automatic reactor trip signal. It came in after the turbine tripped due to the manual reactor trip. There is no E-Plan declaration required.
- B. There was no ATWS. The turbine tripped before the manual trip. However, the manual trip was initiated prior to the generator trip which would have tripped the reactor. There is no E-Plan declaration required.
- C. An ATWS did occur. The "TURBINE TRIP" annunciator is blinking because this was the first signal to reactor protection. A SITE AREA EMERGENCY is declared for this event.
- D. An ATWS did occur. The "TURBINE TRIP" annunciator is blinking because this was the first signal to reactor protection. An ALERT is declared for this event.

Answer: D

Explanation/Justification:

The blinking annunciator on the “first out” panel indicates the first signal (auto or manual) to come in. In this case, it means that the turbine tripped before any other signal and should have caused the reactor to trip. The stem indicates that the reactor tripped from the manual push button. If the operator had pressed the button before the turbine tripped, the blinking alarm would be “MANUAL TRIP”. Therefore a turbine trip w/o reactor trip occurred which is an ATWS. Per EAL SA2.1, this is an ALERT.

A. Incorrect but plausible since there could be a misunderstanding about what the annunciator blinking means.

B. Incorrect but plausible since there could be a misunderstanding about what signal actually trips the reactor on a turbine/generator trip.

C. Incorrect but plausible since for a ATWS where the reactor cannot be tripped at the normal controls, it would be a SAE.

D. Correct answer.

Technical References:	IP-EP-120
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-ICRXP 9
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	0000572420	
		Emergency Procedures/Plan - Knowledge of operational implications of EOP warnings, cautions, and notes.	
	Importance	3.8	4.3

#### Question # 79

A loss of all AC power occurred 15 minutes ago. The Appendix R Diesel is expected to be available to power 480V busses in 30 minutes. The BOP notes that 31 DC Voltage has dropped from 131V prior to the event to 126V. The team is concerned about a loss of vital AC instrument bus power due to depleting station batteries. Which of the following describes how this condition will be addressed by ECA-0.0, Loss of All AC Power?

- A. Since an ELAP (Extended Loss of AC Power) will NOT be declared, no actions will be directed by ECA-0.0 to shed loads.
- B. ECA-0.0 will direct shedding loads using AOP-DC-1, Loss of 125V DC Panel, and AOP-IB-1, Loss of Power to an Instrument Bus.
- C. ECA-0.0 will direct shedding loads using SOP-EL-002, Instrument Bus and Plant Computer Static Inverter Operation, and SOP-EL-003, Battery Charger and 125 Volt DC System Operations.
- D. ECA-0.0 will direct initiation of FSG-004, ELAP DC Bus Load Shed/Management, and FSG-007, Loss of Vital Instrumentation or Control Power.

Answer: B

Explanation/Justification:

For this event an ELAP is not declared since power is expected to be restored within 1 hour. ECA-0.0 will direct use of the AOPs for load shed. There is an option on the foldout page to use the FSGs. However, the candidate has to recall that the note warns against using these actions when not in an ELAP. There is an allowance for SM discretion; however the voltage thresholds in the FSG are much lower than stated in the stem of the question. The simulator shows a 1V drop in DC voltage when the battery charger loses power, so the 5V drop listed in the stem is not unreasonable. This voltage drop makes gives more plausibility to use of FSGs as a distractor. The question tests knowledge of a note in the EOP regarding steps to preclude a loss of vital AC instrument power, so the KA is addressed.

A. Incorrect but plausible since the batteries are designed for 2 hours in these conditions and power will be restored within 60 minutes.

B. Correct answer.

C. Incorrect but plausible since numerous EOPs actions are carried out by SOPs (e.g. MCC reset).

D. Incorrect but plausible if a candidate does not remember the ELAP time requirement or forgets that the note on the foldout precludes use of FSGs for these conditions.

Technical References: 3-ECA-0.0

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPC00 3

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	000077AA201	
		Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: - Operating point on the generator capability curve	
	Importance	3.5	3.6

Question # 80

Unit 3 is initially at 100% when Unit 2 trips. During the subsequent electric grid disturbance, one Stop Valve fails closed at Unit 3. The following are the conditions when parameters stabilize after the transient:

- MTG Hydrogen Pressure 75 psig
- Current Reactor Power 89%
- Current Turbine Power 900 MWe
- Current MVARs 400 Lead

Which of the following describes the actions that will be required based on these events and conditions? (GRAPH EL-1 provided)

- As per AOP-LOAD-1, Excessive Load Increase or Decrease, Power must be reduced to <75%. Voltage will have to be raised at the lower power level to meet GRAPH EL-1 requirements.
- As per AOP-LOAD-1, Excessive Load Increase or Decrease, Power must be reduced to <75%. Voltage should meet GRAPH EL-1 requirements at the lower power without any adjustment.
- Since power is less than 90% a load reduction is NOT required by AOP-LOAD-1, Excessive Load Increase or Decrease. Voltage must be raised to meet GRAPH EL-1 requirements.
- Since power is less than 90% a load reduction is NOT required by AOP-LOAD-1, Excessive Load Increase or Decrease. Voltage currently meets GRAPH EL-1 requirements.

Answer: A

Explanation/Justification:

Provide Graph EL-1

Answering the question requires proper use of the graph. Additionally the candidate has to assess current abnormal conditions and determine that AOP-LOAD-1 applies and that a load reduction is required. This guidance is fairly deep in the AOP.

With pressure at 75 psig, 400 Leading MVARs would be allowed at the new power level. However, the candidate has to recognize that the minimum excitation requirement needs to be met, so voltage will need to be raised.

A. Correct answer.

B. Incorrect but plausible if the candidate does not read/interpret the graph correctly (e.g. does know that the minimum excitation requirement applies).

C. Incorrect but plausible if the candidate does not remember that power reduction to <75% is required by AOP-LOAD-1.

D. Incorrect but plausible if the candidate does not remember that power reduction to <75% is required by AOP-LOAD-1, and if the candidate does not read/interpret the graph correctly (e.g. reads Lagging VARs vs. Leading).

Technical References: 3-AOP-LOAD-1

Proposed References to be provided: Graph EL-1

Learning Objective I3LP-ILO-EDS22K 7  
I3LP-ILO-AOPL0D 3

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	00WE042408 Emergency Procedures/Plan - Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	
	Importance	3.8	4.5

Question # 81

The team is in procedure ECA-1.2, LOCA Outside Containment, at a step to close valves 856H and 856J to isolate a safety injection header. Offsite power was lost during the initial transient and 32 EDG did not automatically load causing 856H to not have power. Which of the following describes the appropriate procedure coordination for this situation?

- A. Steps in the abnormal operating procedure to restore power cannot be implemented until SI is terminated. The valve will have to be locally isolated.
- B. Steps in the abnormal operating procedure to restore power cannot be implemented while performing ECA and FRP procedures. The valve will have to be locally isolated.
- C. The abnormal operating procedure may be implemented at this time to restore power. However, it is not necessary since the line will be isolated by 856J.
- D. The abnormal operating procedure may be implemented at this time to restore power. Taking these steps could make remote operation of the valve possible.

Answer: D

Explanation/Justification:

OAP-015, AOP Users Guide, allows for AOP steps to be implemented after the first 4 steps of E-0 as long as they do not detract from performance of the EOP. Step 3 of E-0 would have actually directed the team to make attempts to restore power to the 480V bus in parallel with EOPs. 856J and H are in parallel paths of the non-BIT SI header, so both need to be closed. These valves are in containment. The LOCA is outside containment, so it is possible to locally operate the valve. However, in this situation, it would be much better to re-energize the bus and avoid a containment entry if possible.

A. Incorrect but plausible. It is plausible that a candidate would either not have the OAP guidance memorized, or think that because SI is still in service that there could be detrimental effects of taking the AOP actions at this time.

B. Incorrect but plausible. It is plausible that a candidate does not have the OAP guidance memorized. There are some restrictions on performing these steps in parallel. It is reasonable that there could be a restriction during ECAs and FRPs.

C. Incorrect but plausible if the candidate does not perfectly recall the valve arrangements. This is the only distractor that can be eliminated by system knowledge.

D. Correct answer.

Technical References:	OAP-015
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-AOPROU T
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	0000032107	
		Conduct of Operations - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	
	Importance	4.4	4.7

Question # 82

Given:

- A single rod dropped into the core 3 hours ago.
- Power was reduced to < 70% power due to QPTR concerns.
- The team is AOP-ROD-1, Rod Control and Indication System Malfunctions preparing to recover the rod.

Which of the following is correct regarding the rate of rod withdrawal?

- Power must be reduced to <50% within the next hour to allow the rod to be withdrawn at normal speed.
- Since more than 2 hours have elapsed AND power is  $\geq 50\%$ , rod withdrawal rate is limited to 3 steps/hour.
- The rod can be withdrawn at normal speed for these conditions.
- If the team waits an additional hour the rod can be withdrawn at normal speed.

Answer: C

Explanation/Justification:

Duplicated from question no 26838

Per a caution before Step 4.54 of AOP-ROD-1, "If rod was dropped < 4 hours ago or power is reduced to < 50%, then rod can be withdrawn at normal speed. Otherwise, rod withdrawal rate is limited to 3 steps/hour."

Question tests at SRO level since this is a step in selecting the procedure section to mitigate the event.

A. Incorrect but plausible since the candidate could easily think you need to meet both requirements.

B. Incorrect but plausible if the candidate confuses 4 hours vs. 2 hours.

C. Correct answer.

D. Incorrect. Plausible if the candidate confuses the purposes of the time restrictions.

Technical References: 2-AOP-ROD-1

3-AOP-ROD-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPROD 6

I3LP-ILO-AOPROD 6

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	000051A202	
		Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: - Conditions requiring reactor and/or turbine trip	
	Importance	3.9	4.1

Question # 83

A plant shutdown is in progress in accordance with POP-3.1, Plant Shutdown from 45% Power, with turbine power at 250 MWe when fouling of the traveling water screens occurs. Service water is not affected, but Main Condenser vacuum lowers and stabilizes at 23.5 inHg. Which of the following is required by the procedures in place for this event?

- A. Since a shutdown is in progress and turbine trip conditions are met per AOP-VAC-1, Loss of Condenser Vacuum, POP-3.1, Plant Shutdown from 45% Power, will require a Reactor Trip.
- B. Turbine trip conditions are met per AOP-VAC-1, Loss of Condenser Vacuum. Trip the Turbine and go to AOP-TURB-1, Main Turbine Trip without a Reactor Trip.
- C. Turbine trip conditions are met per AOP-VAC-1, Loss of Condenser Vacuum. Trip the Turbine and remain in AOP-VAC-1 to stabilize the plant and then return to POP-3.1, Plant Shutdown from 45% Power.
- D. Turbine trip conditions are NOT met per AOP-VAC-1, Loss of Condenser Vacuum. Normal shutdown may continue per POP-3.1, Plant Shutdown from 45% Power.

Answer: B

Explanation/Justification:

At this power level, the required vacuum is 24.5 inHg. 23.5 is less than this value, but greater than the value required at 100% power. This turbine power level listed before the loss of vacuum occurs would correspond with a reactor power level below P-8. However, the candidate may have some confusion as to the setpoint and the fact that this power listed is prior to the loss of vacuum.

Since a turbine trip is required and power is <P-8 setpoint, the correct action is to trip the turbine and enter AOP-TURB-1.

A. Incorrect but plausible. This is very likely what a full team/management may determine is the best course of action. A team may even brief that if a turbine trip occurs during a shutdown then manually trip the reactor. However, an SRO should know that the procedures do not specify this.

B. Correct answer.

C. Incorrect but plausible. It is plausible that AOP-VAC-1 could contain the steps necessary for stabilizing the plant in these conditions as there are not many actions needed. However, an SRO should know the procedure hierarchy.

D. Incorrect but plausible if the candidate has some confusion or misremembers the vacuum levels requiring a turbine trip.

Technical References: 3-AOP-VAC-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-AOPVAC 2

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	00WE022244 Equipment Control - 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.	
	Importance	4.2	4.4

Question # 84

The following conditions exist at IP3:

- Plant was in Mode 3.
- An inadvertent SI occurred due to testing.
- The team is in ES-1.1, SI Termination.
- The BOP just pressed both SI reset pushbuttons.
- The SI ACTUATED light remains ON.

Which of the following describes the status of the SI system based on this indication and what actions specified in ES-1.1 should be taken to put the SI system in the proper condition?

- This is expected since the Reactor Trip Breakers were open at the onset of the event. ES-1.1 directs placing the SI block key switches to DEFEAT and then re-pressing the SI reset pushbuttons.
- This is expected since the Reactor Trip Breakers were open at the onset of the event. ES-1.1 directs placing the SI block key switches to DEFEAT and then pressing SI relay pin resets.
- This is NOT expected for the current conditions. ES-1.1 directs placing the SI block key switches to DEFEAT and then re-pressing the SI reset pushbuttons.
- This is NOT expected for the current conditions. ES-1.1 directs placing the SI block key switches to DEFEAT and then pressing SI relay pin resets.

Answer: D

Explanation/Justification:

SI should reset normally in this condition causing the SI ACTUATED light to extinguish. Either method listed in the second part of the choices would actually work. However, ES-1.1 only specifies pressing the relay pin resets. Therefore this question cannot be answered based solely on system knowledge, but the choices are plausible. The reactor trip breakers are part of the circuit that allows re-enabling automatic SI during recovery from an SI. For this reason, A and B are plausible.

A. Incorrect but plausible.

B. Incorrect but plausible.

C. Incorrect but plausible.

D. Correct answer.

Technical References: 3-ES-1.1

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPS10 3

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	00WE03A201 Ability to determine and interpret the following as they apply to the LOCA Cooldown and Depressurization: - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	
	Importance	3.4	4.2

Question # 85

IP3 had a SBLOCA. The team is performing a Post LOCA cooldown and depressurization at a step to check if RHR can be placed in service. RCS hot leg temperatures are 350°F and RCS pressure is 390 PSIG. Based on these conditions the team should...?

- A. place RHR in service using SOP-RHR-001 and remain in the current EOP.
- B. remain in the current EOP and place RHR in service using an attachment.
- C. place RHR in service using SOP-RHR-001 and transition to ES-1.1, SI Termination.
- D. transition to POP-3.3, Plant Cooldown – Hot to Cold Shutdown, which will place RHR in service.

Answer: A

Explanation/Justification:

The KA is for determining the proper procedure to pick for a situation occurring during a post-LOCA cooldown and depressurization, so the question tests what the procedure flowpath will be when RHR can be placed in service. All of the choices are plausible since a facility could have chosen that administrative path. However, the candidate should know the path at the facility they are getting licensed on. Per ES-1.2, RHR will be placed in service per the SOP. ES-1.2 will not be exited until RCS temperature is <200°F.

A. Correct answer

B. Incorrect but plausible

C. Incorrect but plausible

D. Incorrect but plausible

Technical References: 3-ES-1.2

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPS10 3

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	0030002132	
		Conduct of Operations - Ability to explain and apply all system limits and precautions.	
	Importance	3.8	4

#### Question # 86

The following conditions exist at IP3:

- The plant was operating for 100 days at 100% power.
- The Station Auxiliary Transformer experienced a fault and the appropriate procedures were completed including restoring power to 480V busses from 13.8KV power via feeder 13W93.
- It is estimated that it will take two weeks to replace the Station Auxiliary Transformer.
- Three hours after the initial event, the plant was performing a shutdown when operators tripped the reactor due to a malfunctioning feed regulating valve.

Which of the following describes how RCPs will be operated to stabilize the plant following the trip?

- All RCPs will initially remain in service. When ES-0.1 (Reactor Trip Response) is exited, the POPs will direct securing all but 34 RCP.
- All RCPs will initially remain in service. ES-0.1 (Reactor Trip Response) will direct securing all but 34 RCP.
- Following the trip, all RCPs will lose power. ES-0.1 (Reactor Trip Response) provides guidance to restore power and start 34 RCP on 13.8KV power.
- Following the trip, all RCPs will lose power. Starting RCPs is prohibited on 13.8KV power. Cooldown will be performed using ES-0.2 (Natural Circulation Cooldown).

Answer: D

Explanation/Justification:

When the Station Aux Transformer faulted, AOP-138KV-1 would have restored power with 13.8KV power. The procedure places the fast transfer breakers in pullout to prevent overloading the power supply. When the reactor trips, the 6.9KV busses that power RCPs will de-energize. It is physically possible to power RCPs via 13.8KV power and has been done in the past. U3 put a restriction on starting RCPs on 13.8KV via GT-2F (13W93) power around 2005. U2 can still start RCPs on 13.8KV power. This is a procedural limitation vs. specifically system knowledge. Therefore it is at the SRO level.

A. Incorrect but plausible if the candidate does not recall steps taken in the AOP.

B. Incorrect but plausible if the candidate does not recall steps taken in the AOP.

C. Incorrect but plausible if the candidate does not know the limitation on use of 13.8KV power.

D. Correct answer.

Technical References: 3-SOP-RC-001

Proposed References to be provided: None

Learning Objective I3LP-ILO-RCSRCP 8

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	0080002450 Emergency Procedures/Plan - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	
	Importance	4.2	4

Question # 87

IP3 is performing a plant cooldown for a reactor head o-ring outage with the following conditions:

- RHR was placed in service 15 minutes ago.
- "COMPONENT COOLING PUMP INLET LOOP 1 HIGH TEMP" alarm just annunciated with a temperature of 155°F.
- RCS Temperature is 340°F and lowering.
- SWN-35-1 and SWN-35-2 are both open to 23°.
- All three CCW pumps are in service.

Which of the following describes ARP guidance as to whether this alarm should have come in and what actions are allowed regarding increased service water flow?

- The alarm is expected since the setpoint was reached. Opening restrictions for SWN-35-1/2 APPLY since RCS Temperature is >200°F.
- The alarm is expected since the setpoint was reached. Opening restrictions for SWN-35-1/2 DO NOT APPLY while cooling down at this temperature.
- The setpoint should have been increased 155°F to 175°F when placing RHR in service. If desired to lower temperature, opening restrictions for SWN-35-1/2 APPLY since RCS Temperature is >200°F.
- The setpoint should have been increased 155°F to 175°F when placing RHR in service. If desired to lower temperature, opening restrictions for SWN-35-1/2 DO NOT APPLY while cooling down at this temperature.

Answer: B

Explanation/Justification:

Per ARP-010, the valves normally have restrictions of 27 and 27.5°. However, the valves may be opened beyond this during a cooldown with RCS temperature 350°F. It is plausible that this would not be allowed until Mode 5 when CCW operability does not apply and safeguards are locked out. The normal log limit for CCW header temperature is raised 20°F for 2 hrs when placing RHR in service. This makes C and D plausible choices.

Answering the question requires an assessment of plant conditions and then a selection of the section of the ARP to mitigate the event.

A. Incorrect but plausible.

B. Correct.

C. Incorrect but plausible.

D. Incorrect but plausible.

Technical References: 3-ARP-010

Proposed References to be provided: None

Learning Objective I3LP-ILO-RHR001 9

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	022000A204	
		Ability to (a) predict the impacts of the following malfunctions or operations on the CCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of service water	
	Importance	2.9	3.2

#### Question # 88

Given:

- 31 FCU had a small service water leak.
- The preferred procedural steps to isolate 31 FCU SW were taken per AOP-SW-001, Service Water Malfunction.
- 32 EDG is out of service for maintenance.
- IP3 is at 100% power with all other equipment in a normal alignment.

If a safety injection occurred coincident with a loss of offsite power, which of the following is correct regarding the status of containment cooling and satisfying the safety function?

- 2 FCUs will be operating. The safety function will NOT be satisfied.
- 2 FCUs will be operating. The safety function will be satisfied.
- 3 FCUs will be operating. The safety function will NOT be satisfied.
- 3 FCUs will be operating. The safety function will be satisfied.

Answer: D

Explanation/Justification:

AOP-SW-1 has a note saying that a valve (SWN-40-2) can be used for isolation that would require securing up to 3 FCU (31, 32,35) to isolate 31. However, the note implies this is not a good option, and the actual procedure steps isolate just 31 FCU.

32 EDG being OOS means that on 31 Spray Pump will be available when the SI/LOOP occurs. This means there will be 1 CSP/3 FCUs in service which satisfies the safety function.

A. Incorrect but plausible. If the option of closing SWN-40-2 was used this would be true. However, the preferred isolation method would be to close the individual valves for 31 FCU. The second part would be correct if this option had been taken since only 1 CS/2 FCUs would be available.

B. Incorrect but plausible. If the option of closing SWN-40-2 was used this would be true. However, the preferred isolation method would be to close the individual valves for 31 FCU. The second part is plausible but not true for the listed configuration.

C. Incorrect but plausible. The first part is correct.

D. Correct

Technical References:	3-AOP-SW-1 FSAR Tech Specs
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Proposed References to be provided:	None
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Learning Objective	I3LP-ILO-AOPSW1 2
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	0730002123 Conduct of Operations - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	
	Importance	4.3	4.4

Question # 89

U3 is in Mode 5 and preparing to drain SGs. R-19, SGBD Radiation Monitor is out of service. All SGs are being sampled for activity prior to the drain down.

Which of the following describes expectations and additional actions for this activity per OAP-35, Technical Specifications and Technical Requirements Manual – License Adherence and Use?

- A. R-19 is not used in Mode 5 or 6 due insufficient sample flow. Direct Chemistry to obtain grab samples during the drain down at least every 12 hours.
- B. R-19 is not used in Mode 5 or 6 due insufficient sample flow. Direct Health Physics to monitor the selected R-19 location during the drain down.
- C. R-19 is normally available for this evolution. Direct Chemistry to obtain grab samples during the drain down at least every 12 hours.
- D. R-19 is normally available for this evolution. Direct Health Physics to monitor the selected R-19 location during the drain down.

Answer: A

Explanation/Justification:

Question is at SRO level since it cannot be answered solely by system knowledge. The second part of the choices requires a knowledge of the requirements in the OAP.

A. Correct answer per OAP-35.

B. Incorrect but plausible since the actions described are the actual steps taken if R-15 (Air Ejectors) is out of service.

C. Incorrect but plausible. It is plausible that we could have adequate sample flow for the monitor due to gravity flow to R-19 and also R-19 has a pump. The second part of the response is correct.

D. Incorrect but plausible. It is plausible that we could have adequate sample flow for the monitor due to gravity flow to R-19 and also R-19 has a pump. The actions described are the actual steps taken if R-15 (Air Ejectors) is out of service.

Technical References: OAP-035

Proposed References to be provided: None

Learning Objective I3LP-ILO-RMSPRM 10

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	078000A201 Ability to (a) predict the impacts of the following malfunctions or operations on the IAS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Air dryer and filter malfunctions	
	Importance	2.4	2.9

#### Question # 90

The in service Instrument Air Dryer has become blocked causing a reduction in instrument air pressure. 33 Charging Pump is in service. What effect will this have on charging pump speed, and what procedure will provide guidance for addressing the issue?

- A. 33 Charging Pump speed will fail low. AOP-AIR-1, Air Systems Malfunction, will provide guidance for operating the pump with a loss of air.
- B. 33 Charging Pump speed will fail low. AOP-CVCS-1, Chemical and Volume Control Malfunction, will provide guidance for operating the pump with a loss of air.
- C. 33 Charging Pump speed will fail high. AOP-AIR-1, Air Systems Malfunction, will provide guidance for operating the pump with a loss of air.
- D. 33 Charging Pump speed will fail high. AOP-CVCS-1, Chemical and Volume Control Malfunction, will provide guidance for operating the pump with a loss of air.

Answer: C

Explanation/Justification:

33 Charging Pump fails high on a loss of air. The guidance for operating the charging pump on a loss of air is in AOP-AIR-1. The question is at the SRO level, since either procedure could contain the guidance. Answering the question requires knowing more than just intent of the procedures.

A. Incorrect but plausible. The second part of the answer is correct. The first part is incorrect, but used to be correct making this plausible.

B. Incorrect but plausible. The first part is incorrect, but used to be correct making this plausible. The second part is incorrect but plausible since the guidance could be in AOP-CVCS-1. For example, when AOP-CCW-1 requires letdown to be isolated for a CCW leak, AOP-CVCS-1 is used to put Excess Letdown in service even though the initiating event was not a loss of letdown.

C. Correct answer.

D. Incorrect but plausible. The first part of the answer is correct. The second part is incorrect but plausible since the guidance could be in AOP-CVCS-1. For example, when AOP-CCW-1 requires letdown to be isolated for a CCW leak, AOP-CVCS-1 is used to put Excess Letdown in service even though the initiating event was not a loss of letdown.

Technical References:	3-AOP-AIR-1
Proposed References to be provided:	None

Learning Objective	I3LP-ILO-AOPAIR 2
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		2
	K/A#	015000A204 Ability to (a) predict the impacts of the following malfunctions or operations on the NIS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Effects on axial flux density of control rod alignment and sequencing, xenon production and decay, and boron vs. control rod reactivity changes	
	Importance	3.3	3.8

#### Question # 91

The plant was operating with RTP of 48% steady state for two days when rod C-3 drops into the core. It is estimated that it will take approximately 30 hours to make repairs at the power cabinet and recover the rod.

Which of the following describes the effect this will have on indicated reactor power and PRNI adjustments?

- A. At this power level, it is not expected that PRNIs will be affected sufficiently by this event.
- B. Initially there will be a slight drop in all PRNIs, but indication will quickly return to approximately pre-event values
- C. At this power level, PRNIs will be significantly affected, however adjustments are not made with RTP <50%.
- D. At this power level, PRNIs will be significantly affected and adjustment will be required if AVERAGE indicated reactor power is below or >2% above calculated reactor thermal power.

Answer: D

Explanation/Justification:

This question tests the following concepts and procedure/TS knowledge. The candidate has to understand that even at this low power condition, a dropped rod is going to cause a significant tilt condition to occur. It is not reasonable to expect the candidates to have the reactor coordinates memorized, however prepared candidates know that H-8 is the center meaning C-3 is toward a corner. On the simulator, this malfunction reduced 43 PRNI about 15%.

SR 3.3.1.2 requires thermal power calculation every 24 hours and adjustment if calculated and indicate power differ by >2%. SOP-RPC-006A requires an adjustment whenever indicated power is less than calculated. It is expected that indicated average power will be less than calculated reactor thermal power which has to be performed every 24 hours. Since this event will go on for 30 hours, PRNI adjustments will be required.

A. Incorrect but plausible if the candidate does not understand that this dropped rod will have a significant effect on PRNIs.

B. Incorrect but plausible if the candidate does not understand that this dropped rod will have a significant effect on PRNIs in one quadrant in particular.

C. Incorrect but plausible if the candidate believes that below 50% this is not required. The power level where this would be true is below 15%.

D. Correct answer.

Technical References:	3-SOP-RPC-006A Tech Specs
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Proposed References to be provided:	None
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Learning Objective	I3LP-ILO-ICEXC 8
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Analysis Synthesis Evaluation
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		2
	K/A#	0350002404 Emergency Procedures/Plan - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	
	Importance	4.5	4.7

Question # 92

IP3 experienced a small SGTR in 33 SG. The small rupture size will make use of ES-3.1, Post-SGTR Cooldown using Backfill, ineffective. It is desired to use ES-3.3, Post-SGTR Cooldown using Steam Dump. Which of the following additional conditions would require transition from ES-3.3 to ES-3.2, Post-SGTR Cooldown using Blowdown?

- A. Ruptured SG Activity  $\geq 3E5$   $\mu\text{Ci/ml}$ .
- B. RCPs not available for forced circulation.
- C. PZR Heaters not available for pressure control.
- D. Offsite power not available for condenser cooling.

Answer: A

Explanation/Justification:

This question could be simple memory, but it is unlikely a candidate has memorized EOPs this far into the network. For this reason, the way a typical candidate is likely to confidently answer this is based on reasoning of the two procedures and the challenges presented by each of the choices. SG activity is the one correct item per the procedure. However, each of these other conditions would present a bigger challenge when steaming vs. using blowdown.

The KA is for recognizing entry conditions for emergency procedures. The actual entry conditions are intentionally flexible allowing for staff decision. Step 1 of ES-3.3 checks ruptured SG activity. Therefore, evaluation of activity is the de-facto entry condition for this procedure vs. ES-3.2 if ES-3.1 is deemed to not be appropriate. For these reasons, this question addresses the KA.

The question also test knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific sub-procedures.

A. Correct answer.

B. Incorrect but plausible if the candidate believes ES-3.3 requires forced circulation to use SG steaming as a means of cooling the SG.

C. Incorrect but plausible since heaters are specifically energized in ES-3.3 and only may be energized in ES-3.2 depending on indications.

D. Incorrect but plausible based on the title of the procedure. "Steam Dumps" is general meant to refer to the high pressure steam dumps at IPEC. However, the procedure has guidance for using the atmospheric steam dumps which are generally called "atmos" at IPEC.

Technical References: 3-ES-3.3

Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPE30 2

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		2
	K/A#	068000A204	
		Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Failure of automatic isolation	
	Importance	3.3	3.3

Question # 93

Given:

- The plant is operating at 100% power with all systems in normal alignments.
- A liquid release of 31 Monitor Tank is in progress.
- The following annunciators are received in the Control Room
  - CHANNEL FAILURE-
  - R-18 LIQ. EFF."
- The liquid release remains in progress.

Which ONE (1) of the following describes effect on the plant and the actions required?

- A. The radiation monitor has failed, but this failure should NOT have secured the release automatically. Request that HP recheck calculations and provide recommendations on action to be taken.
- B. The radiation monitor has failed, but this failure should NOT have secured the release automatically. Direct Chemistry to sample the tank and refer to IP-SMM-CY-001, Radioactive Effluents Control, for further actions.
- C. The discharge should have automatically stopped. Stop the discharge, direct Chemistry to sample the tank and refer to IP-SMM-CY-001, Radioactive Effluents Control, for further actions.
- D. The discharge should have automatically stopped. Stop the discharge. The release CANNOT be continued until R-18 is operable.

Answer: C

Explanation/Justification:

A. Incorrect but plausible. Plausible since the monitor has failed and although the release is not being monitored, the tank was sampled.

B. Incorrect but plausible. The release must be terminated. This is plausible since the release can go on after these actions are taken.

C. Correct per SOP

D. Incorrect but plausible. It is plausible that this monitor has to be operable.

Technical References:	3-ONOP-RM-1 3-SOP-WDS-014
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Proposed References to be provided:	None
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Learning Objective	I3LP-ILO-RMSPRM E
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Question Source:	Bank
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Question History:	2013 IP3
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012137	
		Conduct of Operations - Knowledge of procedures, guidelines, or limitations associated with reactivity management.	
	Importance	4.3	4.6

Question # 94

EN-OP-115, Conduct of Operations, requires a second licensed operator or Shift Technical Advisor with no concurrent activities to be present during manual rod insertion or withdrawal. Which of the following statements correctly describes if and when the CRS may waive this requirement?

- A. The CRS cannot waive this requirement.
- B. The CRS can waive this requirement for rod insertions ONLY at any time.
- C. The CRS may waive this requirement for rod insertions ONLY during ONLY AOPs and EOPs.
- D. The CRS may waive this requirement for rod insertions AND withdrawals during ONLY AOPs and EOPs.

Answer: C

Explanation/Justification:

Per EN-OP-115, the CRS may waive this requirement for insertions during AOPs and EOPs.

- A. Incorrect but plausible since it could be required that the SM waive this.
- B. Incorrect but plausible that during rod insertions this could be waived.
- C. Correct answer.
- D. Incorrect but plausible since rod withdrawals could be performed in AOPs to restore rods to previous position following an instrument failure.

Technical References: EN-OP-115

Proposed References to be provided: None

Learning Objective IOLP-ILO-ADM01 1

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group# K/A#	1940012142 Conduct of Operations - Knowledge of new and spent fuel movement procedures.	
	Importance	2.5	3.4

Question # 95

Given the following conditions at Unit 3:

- The unit is in MODE 6 performing core reload

In accordance with 3-REF-003-GEN Section 3.1, Fuel Movement Requirements – Core Reload,

- 1) Bypassing fuel handling interlocks not covered by a procedure can only be approved by the \_\_\_\_ (1).
- 2) The Refueling SRO \_\_\_\_ (2) required to be inside Containment for control rod latching.

- A. 1. Refueling SRO  
2. is
- B. 1. Refueling SRO  
2. is NOT
- C. 1. Shift Manager  
2. is
- D. 1. Shift Manager  
2. is NOT

Answer: A

Explanation/Justification:

This question was Question 95 on the 2015 McGuire NRC Exam

3-REF-003-GEN Section 3.1 states that the RSRO has to give permission to bypass interlocks. The RSRO must in containment for core alterations. Latching control rods is a core alteration.

A. Correct answer.

B. Incorrect but plausible if the candidate does not realize that latching control rods is a core alteration. The first part is correct.

C. Incorrect but plausible. The SM has overall responsibility for the unit, but the RSRO is specified in the procedure. The second part is correct.

D. Incorrect but plausible. The SM has overall responsibility for the unit, but the RSRO is specified in the procedure. The second part is plausible if the candidate does not realize that latching control rods is a core alteration.

Technical References:

Proposed References to be provided: None

Learning Objective I3LP-ILO-FHD001 8

Question Source: Bank

Question History: McGuire 2015

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012219	
		Equipment Control - Knowledge of maintenance work order requirements.	
	Importance	2.3	3.4

Question # 96

A worker is signed on a Work Order Holder on a tagout. Operations wants to restore the system. The Tagout Holder informs that all the work is complete and the work order is taken to Complete. The individual worker has left work for day without signing off the tagout.

Which of the following is required to clear the tagout at this time?

- A. Since the work order was taken to Complete, the FSS may sign the individual off of the tagout without completing a Tagout Alternate Release.
- B. A Tagout Alternate Release must be performed. This is approved by the FSS.
- C. Since the work order was taken to Complete, the SM may sign the individual off of the tagout without completing a Tagout Alternate Release.
- D. A Tagout Alternate Release must be performed. This is approved by the SM.

Answer: D

Explanation/Justification:

This question matches the KA since the candidate has to understand the work order process to know that work order status does not prevent an individual from performing work. Per EN-OP-102, a Tagout Alternate Release must be completed which is approved by the SM.

A. Incorrect but plausible if the candidate is not sufficiently familiar with the work order/tagout process.

B. Incorrect but plausible since the procedure could allow the FSS to approve the form.

C. Incorrect but plausible if the candidate is not sufficiently familiar with the work order/tagout process.

D. Correct answer.

Technical References:	EN-OP-102
Proposed References to be provided:	None

Learning Objective	I0LP-ILO-ADM01 1
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments



Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012240	
		Equipment Control - Ability to apply technical specifications for a system.	
	Importance	3.4	4.7

Question # 97

The plant is at 100% power.

- 0830 on December 3, the 31 RHR pump is declared inoperable.
- 2300 on December 5, the 33 HHSI pump is declared inoperable.
- 0215 on December 6, the 31 RHR pump is restored to OPERABLE status.

Given a copy of TS sections 1.3 and 3.5.2, including any extensions that are permitted by TS, which one of the following describes the LATEST time and date to restore the 33 HHSI pump to OPERABLE status without requiring a unit shutdown?

- A. 0830 on December 6
- B. 0830 on December 7
- C. 2300 on December 8
- D. 2300 on December 9

Answer: B

Explanation/Justification:

Duplicated from question no 1565 for use on NRC exam  
Include TS Section 1.3 and 3.5.2

This is a bank question where section 3.5.2 and 1.3 of TS is normally supplied. Section 1.3 will not be supplied. The candidate will have to know how to apply completion time guidance from memory.

The original inoperability of 31 RHR pump required return to operability by 0830 on 12/6 (choice A).

33 HHSI becoming inoperable (if alone) would have required operability by 2300 on 12/8 (choice C).

TS 1.3 says to pick the more limiting of either completion time for original entry + 24 hours or subsequent entry completion time. In this case the more limiting time original completion time + 24 hours (choice B).

A. Incorrect but plausible if candidate believes we have to use original required completion time.

B. Correct answer.

C. Incorrect but plausible if the candidate believe that completion time is based solely on what is currently inoperable.

D. Incorrect but plausible if the candidate believes that the 24 hours is added to the longest completion time.

Technical References: Tech Specs

Proposed References to be provided: Technical Specification 3.5.2

Learning Objective I3LP-ILO-RHR001 9

Question Source: Bank

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group# K/A#	1940012314 Radiological Controls - Knowledge of radiation or contaminatin hazards that may arise during normal, abnormal, or emergency conditions or activities.	
	Importance	3.4	3.8

Question # 98

Given the following conditions:

You are assigning an operator to inspect the reactor vessel o-ring flange.

Dose rate at the flange is 3000 mRem/hr.

The operator has a lifetime TEDE of 750 mRem.

The operator has 200 mRem TEDE for this year.

In accordance with EN-RP-101 (Access Control for Radiologically Controlled Areas) and EN-RP-201 (Dosimetry Administration):

The work area must be posted as a (1) Area.

The MAXIMUM time the operator can stay at the flange and not exceed the routine annual administrative guideline for TEDE is (2) minutes.

- A. (1) Locked High Radiation  
(2) 16
- B. (1) Locked High Radiation  
(2) 36
- C. (1) Very High Radiation  
(2) 16
- D. (1) Very High Radiation  
(2) 36

Answer: B

Explanation/Justification:

This question was used by McGuire in 2015. Some modifications were made due to procedure differences.

The routine annual administrative guideline for TEDE is 2000 MRem.  $36 \times 3000/60 = 1800$ .  $1800 + 200 = 2000$ . 3000 mRem/hr would be a locked high radiation area.

A. Incorrect but plausible since the candidate could believe there is a 1000 mRem routine limit. It is rare that operators come close to their limit these days, so this is a plausible misconception.

B. Correct answer.

C. Incorrect but plausible this is a much higher dose rate than often encountered. The second part is plausible as discussed for choice A.

D. Incorrect but plausible as discussed for A and C.

Technical References:	EN-RP-201
Proposed References to be provided:	None

Learning Objective	I0LP-ILO-ADM01 1
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Question Source:	Bank
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Question History:	McGuire 2015
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Question Cognitive Level:	Analysis Synthesis Evaluation
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10 CRF Part 55 Content:	55.43 (b) 4
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012426	
		Emergency Procedures/Plan - Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage.	
	Importance	3.1	3.6

Question # 99

U3 is in Mode 6 for a planned refueling outage. U2 is in Mode 5 for a forced outage to perform repairs to a transformer. You are the FSS and you want to use two NPOs that are designated as Fire Brigade responders to apply a tagout at the South Gate Substation in the Training Center parking lot. Which of the following correctly describes if and why this allowed or not allowed per procedure? (assume the operators will have a vehicle and radios)

- A. This is allowed, but ONLY because both units are below Mode 4.
- B. This would be allowed in any mode because the job is within the OCA.
- C. This is NOT allowed because only one fire brigade member can leave the protected area.
- D. This is NOT allowed because no fire brigade members can leave the protected area.

Answer: C

Explanation/Justification:

Per OAP-115, only one fire brigade member may leave the protected area. There is no discussion of plant mode.

The question is at the SRO level because the candidate has to assess conditions and properly implement and administrative procedure.

A. Incorrect but it is plausible that mode may affect requirements as it does for many other requirements.

B. Incorrect but plausible since there are allowances for sending one member out of the protected area it is not unreasonable that two would be allowed.

C. Correct answer.

D. Incorrect but plausible. It would be reasonable to not allow any fire brigade member to leave the protected area.

Technical References: OAP-115

Proposed References to be provided: None

Learning Objective I0LP-ILO-ADM01 1

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012444	
		Emergency Procedures/Plan - Knowledge of emergency plan protective action recommendations.	
	Importance	2.4	4.4

Question # 100

Which of the following is correct regarding when protective action recommendations (PARs) are made when a General Emergency is declared?

- A. PARs are always made with this declaration.
- B. PARs are ONLY made if there is an expected release > Tech Spec limits.
- C. PARs are ONLY made if there is an expected release > 10CFR20 exposure limits.
- D. PARs are ONLY made if there is an expected release > EPA Protective Action Guidelines.

Answer: A

Explanation/Justification:

Per IP-EP-410, PARs are made for all GE declarations. There is no requirement for having a release to make PARs.

A. Correct answer.

B. Incorrect but plausible. It is plausible that PARs would not be make without a release.

C. Incorrect but plausible. It is plausible that people would not be evacuated if exposure is less than federal limits.

D. Incorrect but plausible. It is plausible that the EPA Guidelines would be permissible limits where action is NOT required.

Technical References:	IP-EP-420
Proposed References to be provided:	None

Learning Objective	I0LP-ILO-ADM01 1
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Question Source:	New
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Question History:	N/A
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments