Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000007K301 Knowledge of the reasons for the following responses as they apply to the reactor trip: - Actions contained in EOP for reactor trip	
	Importance	4	4.6

Question # 1

A Reactor Trip has occurred. The crew is responding using E-0, Reactor Trip or Safety Injection. At step 4 Safety Injection is not required.

Which of the following describes the required AFW flowrate and the basis for this value?

A. 400 gpm to prevent a transition to FR-H.1 on transition out of E-0.

B. 400 gpm to prevent water relief through the PORVs

C. 760 gpm to prevent a transition to FR-H.1 on transition out of E-0

D. 760 gpm to prevent water relief through the PORVs

Answer: D

Explanation/Justification:

From the Background Document:
If SI is not required, AFW pumps are started to satisfy SPU LONF/LOAC (Loss of normal feedwater/loss of non-vital AC) Analysis TA-03-126 requiring 760 gpm AFW flow within 10 minutes for heat removal if only ONE Motor Driven Pump Auto-Starts.

From NL-04-073:
Using Licensing assumptions, the additional AFW flow at 10 minutes is needed to prevent the pressurizer from going water solid.

A. Incorrect, Plausible because 400 gpm is the correct value if SI is ACTUATED. Also removal of decay heat and RCP heat is adequate with 400 gpm AFW flow.

B. Incorrect, Plausible because 400 gpm is the correct value if SI is ACTUATED and it is to prevent water relief through the PORVs.

C. Incorrect, Plausible because 760 gpm flowrate is correct.

D. Correct.

Technical References: 2-E-0 BG
Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE00 1

Question Source: New

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#	1	
	Group#	1	
	K/A#	000008K302 Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: - Why PORV or code safety exit temperature is below RCS or PZR temperature	
	Importance	3.6	4.1

Question # 2

Given the following:

- A plant heatup is in progress.
- PRZR Pressure is 2235 psig
- PRZR Temperature is 652°F
- PRT Pressure is 4 psig
- A pressurizer Safety Valve starts to leak

Which of the following states the expected temperature at the Safety Valve exit and why this temperature is below PRZR Temperature?

A. 224°F, because the entropy of the steam will be constant

B. 336°F, because the enthalpy of the steam will be constant

C. 224°F, because the enthalpy of the steam will be constant

D. 336°F, because the entropy of the steam will be constant

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the Temperature value is correct; however, throttling is a constant enthalpy process, not a constant entropy process.

B. Incorrect. Plausible because the temperature value is incorrect; it is the value the candidate would determine if he used the PRT pressure equivalent to the rupture disk setpoint

C. Correct. 224°F is saturation temperature for 4 psig (19 psia) and the process is a constant enthalpy process.

D. Incorrect. Plausible because the temperature value is incorrect; it is the value the candidate would determine if he used the PRT pressure equivalent to the rupture disk setpoint. In addition, the process is a constant enthalpy not entropy.

Technical References:
Proposed References to be provided: None

Learning Objective IOLP-ILO-TH004 24

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#	1	
	Group#	1	
	K/A#	000009A111 Ability to operate and/or monitor the following as they apply to a small break LOCA: - AFW/MFW	
	Importance	4.1	4.1

Question # 3

A Small Break LOCA has occurred. RCS pressure has stabilized above SG pressure.

What effect (if any) does this Small Break LOCA have on the required AFW flow to the Steam Generators and what actions are required?

A. Adequate Reactor Coolant System (RCS) heat removal occurs through the pipe break. AFW flow will be minimized to prevent a Steam Generator overfill condition.

B. Inadequate Reactor Coolant System (RCS) heat removal exists through the pipe break. AFW flow will be controlled to establish/maintain the Reactor Coolant subcooled.

C. Void formation in the S/G U-tubes may occur if there are no Reactor Coolant Pumps operating. Maximum AFW flow should be maintained to prevent voids in the Intermediate and Cold legs.

D. Void formation in the S/G U-tubes will occur if there are no Reactor Coolant Pumps operating. Minimum AFW flow should be established to promote "blowing the loop seal".

Answer: B

Explanation/Justification:

A. Incorrect: For SBLOCAs inadequate heat removal exists through the pipe break; SGs as a heat sink are necessary to prevent over heating RCS.

Plausible: For LBLOCAs adequate heat removal does exist through the break and AFW flow must be controlled to prevent overfill.

B. Correct: For SBLOCAs inadequate heat removal exists through the pipe break; SGs as a heat sink are necessary to prevent over heating RCS. The goal of ES-1.2, Post LOCA Cooldown and Depressurization is to establish subcooling for SI flow reduction.

C. Incorrect: Void formation is more dependant on other factors such as leak rate and ECCS flow.
Plausible: The goal of ES-1.2, Post LOCA Cooldown and Depressurization is to establish subcooling for SI flow reduction not just prevent void formation.

D. Incorrect: Void formation is more dependant on other factors such as leak rate and ECCS flow. "Blowing the loop seal" does result in less mass loss from the RCS (steam flow from break vs liquid water)
Plausible: The goal of ES-1.2, Post LOCA Cooldown and Depressurization is to establish subcooling for SI flow reduction not promote blowing the loop seal.

Technical References:	2-ES-1.2 BG
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPS12 4 I0LP-ILO-MCD001 13
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#	000011K202 Knowledge of the interrelations between the Large Break LOCA and the following: - Pumps	
	Importance	2.6	2.7

Question # 4

Given the following:

- 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?

A. All RCPs will be stopped because the RCP trip criteria of the foldout page was met.

B. All RCPs will be stopped to prevent mechanical damage to the pumps and motors.

C. One RCP will be running to conserve remaining three if it is needed for degraded core cooling conditions.

D. 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 condtions.

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 condtions.

Technical References:	2-E-0 WOG-Executive
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPE00 15
Question Source:	Bank
Question History:	Unit 3 NRC 2010
Question Cognitive Level:	Synthesis Evaluation
10 CRF Part 55 Content:	55.41 (b) 3

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	0000152107 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 # 5

Given the following:

Reactor Power:	100%
21 RCP Seal Return Flow:	5.0 gpm and stable
21 RCP Upper Radial Bearing Temperature:	186°F and stable.
21 RCP Vibration:	14 mils and stable
21 RCP #1 Seal Inlet Temperature:	130°F and stable
21 RCP Stator Winding Temperature:	275°F and stable

The following annunciators are in alarm:

- 21 RCP HIGH VIBRATION
- RCP BRG TEMP HIGH
- RCP NO. 1 SEAL RETURN HIGH/LOW FLOW (COMMON)

The CRS has announced entry into AOP-RCP-1.

What actions should be taken based upon 21 RCP indications?

A. Trip the reactor, Trip 21 RCP, Initiate E-0, Close 21 RCP Seal Inlet Needle Valve (241-A).

B. Notify I&C to change High Vibration alarm setpoint, Initiate Attachment 1, Initiate POP 3.1 (Plant Shutdown From Full Power Operation to Zero Power Condition).

C. Initiate Attachment 1, Initiate POP 3.1 (Plant Shutdown From Full Power Operation to Zero Power Condition), Initiate action to reduce 21 RCP bearing temperature.

D. Trip the reactor, Trip 21 RCP, Initiate E-0.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible: Tripping the reactor and RCP are correct actions. Closing 21 RCP seal Inlet Needle valve is required if seal inlet temperature increases to 225.

B. Incorrect. Plausible: This statement is correct for the vibration condition; however the more sever condition of Stator Temperature ≥ 250°F is a higher priority.

C. Incorrect: This statement is correct for the Upper Bearing Temperature condition; however the more sever condition of Stator Temperature ≥ 250°F is a higher priority.

D. Correct. The Stator Winding Temperature ≥ 250°F requires a Reactor Trip and Tripping the RCP.

Technical References:	2-AOP-RCP-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-AOPRCP 4
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 3

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000025K205 Knowledge of the interrelations between the Loss of Residual Heat Removal System and the following: - Reactor building sump	
	Importance	2.6	2.6

Question # 6

Given the following:

- A plant heatup was in progress.
- RCS Temperature was 210°F and slowly increasing
- RCS Pressure was 352 psig
- RCS pressure starts to decrease rapidly
- Pressurizer Level starts to decrease rapidly
- Containment Sump level starts to increase

The crew tripped the RHR pumps due to cavitation and entered 2-AOI-4.2.2, LOCA When RCS Temperature is at Least 200°F and Less Than 350°F. An investigation revealed a large pipe break in loop 23 intermediate leg. Which of the following describes the expected cooling lineup after approximately 6 hours? Assume all equipment operates as designed.

A. RHR pumps taking a suction on the Containment Sump and discharging to the RCS injection path.

B. Recirculation Pumps taking a suction on the Recirc Sump and discharging to the RCS injection path.

C. RHR pumps taking a suction on the RWST and discharging to the RCS injection path

D. Recirculation Pumps taking a suction on the Recirc Sump and discharging to the Safety Injection pump to the RCS injection path.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because this lineup would be used if internal recirculation was not able to be established.

B. Correct. 2-AOI-4.2.2 will direct the crew to lineup internal Recirculation using ES-1.3. This is the preferred lineup.

C. Incorrect. Plausible because this lineup would have been used to establish/maintain RCS inventory; however, a large pipe crack would result in draining the RWST to the recirc/containment sumps by this time.

D. Incorrect. Plausible because this flowpath would be used if RCS pressure was above the shutoff head of the Recirculation Pumps. This path is also used for Hot leg recirculation. Hot leg recirculation would not be initiated until 6 hours after the event.

Technical References:	2-AOP-RHR-1 2-ES-1.3 AOI 4.2.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-AOPRHR 2
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#	1	
	Group#	1	
	K/A#	000022K101 Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: - Consequences of thermal shock to RCP seals	
	Importance	2.8	3.2

Question # 7

A large steam break inside containment has occurred resulting in a reactor trip, safety injection and Containment Spray actuation. A loss of off-site power occurred when the unit tripped. The crew failed to restart a charging pump.

The crew performed the actions in E-2, Faulted Steam Generator Isolation and transitioned to E-1, Loss of Reactor or Secondary Coolant. SI termination criteria were met, and the crew transitioned to ES-1.1, SI Termination.

The crew checked to determine if charging flow had been established in ES-1.1.

Which of the following describes the actions regarding charging flow and why?

A. Start a charging pump at maximum speed. RCS inventory control is critical to prevent re-initiation of SI.

B. Isolate the RCP seals, then start a charging pump. Thermal shock of the Thermal Barrier Heat Exchanger may cause tube failure.

C. Start a charging pump and adjust flow as necessary. CCW flow has been maintained to the RCP thermal barrier heat exchange.

D. Isolate the RCP seals, then start a charging pump. Thermal shock to the RCP seals may cause a seal failure.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because a charging pump is started at maximum is correct since CCW was lost when SI and Blackout occurred. However, the RCP seals must be isolated to prevent thermal shock prior to starting the charging pump.

B. Incorrect. Plausible because isolating the seals is correct prior to starting the charging pump; however the thermal shock concern is the seals not the thermal barrier heat exchanger.

C. Incorrect. Plausible because starting the charging pump and adjusting flow as necessary is correct, if CCW was maintained throughout the event. Since CCW was lost on SI and Blackout, the seals should be isolated first.

D. Correct. When seal injection and CCW are lost for significant period of time, the seals will overheat. The seals are isolated to prevent thermal shock and seal failure.

Technical References: 2-ES-1.1
Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPS11 4

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#	1	
	Group#	1	
	K/A#	000029K105 Knowledge of the operational implications of the following concepts as they apply to the ATWS: - definition of negative temperature coefficient as applied to large PWR coolant systems	
	Importance	2.8	3.2

Question # 8

The reactor fails to trip when required. The control room operators take actions as per the Functional Restoration Procedures and obtain the required plant/system/component responses, except that the reactor is still not tripped, and emergency boration cannot be initiated because of blockage in the boration flow paths. All PR channels indicate 6% and the startup rate is zero on both IR channels.

Which of the following describes the correct operator actions under these conditions AND the primary reason for taking those actions?

A. Return to the procedure and step in effect. Power is less than 9%, and the IR startup rate is zero.

B. Allow the RCS to heat up while continuing efforts to establish emergency boration. The heatup will insert negative reactivity.

C. Go to FR-S.2, Loss of Core Shutdown. This is required by the subcriticality status tree based on current reactor conditions.

D. Maintain RCS temperatures stable while continuing efforts to establish boration. Stable temperatures preclude positive reactivity insertion by cooldown.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because candidate must remember power must be below 5% and startup rate negative to exit FR-S.1.

B. Correct. The procedure directs allowing the RCS to heatup if no other means of negative reactivity insertion is possible.

C. Incorrect. Plausible because candidate may believe that FR-S.1 is exited when no further actions are directed and entry condition for FR-S.2 are met.

D. Incorrect. Plausible because FR-S.1 allows implementing actions of other Functional Restoration procedures that do not cooldown or otherwise add positive reactivity.

Technical References:	2-FR-S.1 3-FR-S.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPFS1 1
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#	1	
	Group#	1	
	K/A#	000038K304 Knowledge of the reasons for the following responses as they apply to the SGTR: - Automatic actions provided by each PRM	
	Importance	3.9	4.1

Question # 9

Given the following:

- A plant startup is in progress with condenser vacuum being established using Steam Jet Air Ejectors (SJAE) and a Vacuum Pump.
- A 45 gpm Steam Generator Tube Leak occurred in 23 SG
- R-45 (Air Ejector Exhaust Gas Activity Monitor) is in alarm.
- All automatic actions occur.

Which of the following statements is correct? Assume no operator action.

A. SJAE AND Vacuum Pump exhaust will be directed to containment.

B. SJAE exhaust will be directed to containment and the Vacuum Pump will trip.

C. SJAE AND Vacuum Pump exhaust will be directed to atmosphere since there is no SI Signal.

D. SJAE exhaust will be directed to containment. Vacuum Pump exhaust will continue to go to atmosphere

Answer: D

Explanation/Justification:

A. Incorrect. Plausible, candidate must remember that the Vacuum Pumps discharge through a different path to atmosphere than the Air Ejectors

B. Incorrect. Plausible, the Air Ejectors will discharge to containment, but the vacuum pumps will not automatically trip.

C. Incorrect. Plausible, the candidate nat believe that an SI signal will be required for the diversion to VC.

D. Correct. Air Ejectors will divert to Containment on R-45 Alarm; however the vacuum pumps will continue to discharge through a different path to atmosphere

Technical References:	2-SOP-12.3.3
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RMS001 5
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#	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 # 10

Reactor is tripped from full power with a concurrent loss of offsite power.

Ten minutes after the trip the following conditions exist:

- All S/G Pressures - ~1030 psig and stable.
- All Reactor Coolant Pumps are OFF.
- Reactor Coolant System pressure is 2230 psig and stable.
- Thot is approximately 575°F in all loops and lowering slowly.
- Core Exit thermocouples indicate approximately 580°F.
- Tcold is approximately 550°F in all loops and stable.

Based on the above conditions, what is the status of RCS cooling and what action is required?

A. Natural Circulation exists. The High Pressure Steam Dumps are to be used to maintain heat removal.

B. Natural Circulation does NOT exist. It can be established by opening the SG Atmospheric Dump valves.

C. Natural Circulation does NOT exist. It can be established by opening the High Pressure Steam Dump valves.

D. Natural Circulation exists. The SG Atmospheric Dump valves are to be used to maintain heat removal.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because Natural Circulation does exist; however, the candidate must remember that Circulating Water pumps were lost on the loss of offsite power and the condenser steam dumps are not available.

B. Incorrect. Plausible – Candidate must calculate RCS subcooling and saturation temperature for SG pressure. If not correctly calculated, candidate may believe that Natural Circ does not exist.

C. Incorrect. Plausible – Candidate must calculate RCS subcooling and saturation temperature for SG pressure. If not correctly calculated, candidate may believe that Natural Circ does not exist. In addition, the candidate must remember that the High Pressure Steam Dumps are not available.

D. Correct. Candidate must calculate RCS subcooling and saturation temperature for SG pressure

Technical References:	2-E-0 2-ES-0.2 3-E-0 3-ES-0.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPS01 2
Question Source:	Modified
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#	1	
	Group#	1	
	K/A#	0000572120 Conduct of Operations - Ability to interpret and execute procedure steps.	
	Importance	4.6	4.6

Question # 11

Given the following:

- The plant is operating at 85% power.
- All control systems are in the normal full power alignment.
- B channels are selected for Steam Flow and Feed Flow
- Multiple alarms annunciate indicating a Loss of an Instrument Bus.

The loss of which of the following instrument buses requires a manual reactor trip and why.

A. 21/21A Instrument Bus due to loss of boric acid controller – Uncontrolled boration.

B. 21/21A Instrument Bus due to loss of Reactor Makeup water controller – Uncontrolled dilution

C. 23/23A Instrument Bus due to all MFRVs and Bypass FRVs fail closed.

D. 23/23A Instrument Bus due to loss of "B" level channels fail low – Main Feed Regulating Valves fail Open.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because Unit 2 lost 21 Instrument Bus and based on indications the operators thought they had an uncontrolled boration when a small boration was actually occurring. The crew took actions to dilute which was unnecessary.

B. Incorrect. Plausible because Unit 2 lost 21 Instrument Bus and based on indications the operators thought they had an uncontrolled boration when a small boration was actually occurring. The crew took actions to dilute which was unnecessary.

C. Correct. Foxboro Racks B4 and B5 (Feedwater Control) will be lost. All 4 MFRVs and all 4 bypass FRVs will fail closed and 2-AOP-IB-1 requires a manual trip for this reason.

D. Incorrect. Plausible because B level channel does fail low and it is the only input to SGWLC from SG level. This would cause the FRVs to go full open; however, the loss of all SGWLC controllers causes the valves to actually go closed.

Technical References:	2-AOP-IB-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-AOPIB1 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#	000058A203 Ability to determine and interpret the following as they apply to the Loss of DC Power: - DC loads lost; impact on to operate and monitor plant systems	
	Importance	3.5	3.9

Question # 12

Given the following:

- loss of control power is indicated to 6900kv breakers (UT3/UT4/ST6) for Buses 3, 4, 6.
- Alarm Panel checks indicate the annunicators are lost to sections FAF and FDF.

Based upon these indications the team should investigate circuit breaker problems on:

A. DC Panel 21

B. DC Panel 22

C. Instrument bus 23

D. Instrument Bus 24

Answer: B

Explanation/Justification:

A Incorrect: Plausible because it will also cause a reactor trip if lost and power indication to 6900kv breakers.

B Correct

C Incorrect: Plausible because the instrument bus also provides protection, actuation and control signals

D Incorrect: Plausible because the instrument bus also provides protection, actuation and control signals

Technical References: 2-AOP-DC-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-EDS03 8

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#	000027A101 Ability to operate and/or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: - PZR heaters, sprays, and PORVs	
	Importance	4	3.9

Question # 13

Given the following:

- Reactor Power is 100% power with all control systems in automatic
- Pressurizer pressure channel III, PT-457, is the controlling channel
- All Pressurizer pressure channels are operable
- All Pressurizer control components are operable

If Pressurizer pressure channel III fails LOW under these conditions, which one of the following best describes the effect on the plant assuming no operator actions are taken to mitigate the event?

A. Reactor trip on High Pressurizer Pressure

B. PORV, PCV-456 will maintain RCS pressure approximately 80 to 100 psig above normal.

C. No effect on RCS pressure because Pressurizer Spray Valves, 455A and 455B will NOT open.

D. Backup Heaters will maintain RCS pressure approximately 35 to 50 psig below normal.

Answer: A

Explanation/Justification:

A. Correct. Candidate must remember that Channel III provides the interlocking signal to PORV 456 and the opening signal it Block Valve. If selected for control (as is the case here) it provides the opening signal to 455C to . The PORVs will not open and the RCS pressure will continue to increase to the High Pressure Rx Trip (2362 psig)

B. Incorrect. Plausible because if Channel I was selected for control and it failed low, PORV 456 would open and maintain pressure approximately 2315 – 2335 psig.

C. Incorrect. Plausible because it is true that the Spray Valves will not open; however, all heaters will energize and pressure will increase.

D. Incorrect. Plausible because the candidate must remember that the backup heaters are controlled from the master pressure controller. With its output at minimum all heaters will be energized.

Technical References:
Proposed References to be provided: None

Learning Objective	I2LP-ILO-RCSPZR 5 I3LP-ILO-ICPZPC 5
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#	1	
	Group#	1	
	K/A#	000065A102 Ability to operate and/or monitor the following as they apply to the Loss of Instrument Air: - Components served by instrument air to minimize drain on system	
	Importance	2.6	2.8

Question # 14

Given the following:

- The Unit is at 50% Power
- INST AIR LOW PRES alarm has actuated,
- Instrument air pressure is 90 psig and decreasing slowly,
- Both Instrument Air Compressor control switches are in AUTO,
- Pressurizer level is 54% and increasing slowly,
- Steam Generator levels are 47% and decreasing slowly,
- VCT level is 15% and decreasing slowly.

Which ONE of the following are actions in AOP-AIR-1 to reduce loss of air?

A. Close IA-36-9, Instrument Air to ABFP and Screen Wash Area

B. Close SA-33, SA U3 Tie Stop valve.

C. Close IA-1212, Station Air Backup Stop

D. Close SA-874, Header Stop Water Treatment Plant

Answer: B

Explanation/Justification:

A. Incorrect. Plausible the candidate may believe this is an option because the Inst Air System in the ABFP Building is backed up by Nitrogen.

B. Correct. Candidate may believe this is incorrect because the Station Air system is typically cross connected with Unit 2 supplying air to Unit 3.

C. Incorrect. Plausible because candidate may believe a leak in the Station Air System may drain the Instrument Air System.

D. Incorrect. Plausible because candidate may believe the loads in the Water Treatment Plant are inconsequential.

Technical References:	2-AOP-AIR-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-SA01 12
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#	1	
	Group#	1	
	K/A#	000077AK201 Knowledge of the interrelations between Generator Voltage and Electrical Grid Disturbances and the following: - Motors	
	Importance	3.1	3.2

Question # 15

The unit is at 100% power. A system wide grid disturbance has cause voltage to drop. The current 480V bus voltage has decreased to 417 Volts on bus 5A and 6A.

Which one of the following describes the results of this condition and the purpose of these actions?

A. Sustained undervoltage for 180 seconds will open the normal bus feed breaker. Undervoltage on any bus will start all EDGs. The output breaker must be manually closed to re-energize the bus.
These actions protects 480 V motors from a low voltage/high current condition by opening the Normal supply breakers

B. Sustained undervoltage for 180 seconds will start the EDGs. The normal bus feed breaker must be manually opened and the EDG output breakers must be manually closed.
These actions protects 480 V motors from a low voltage/high current condition by opening the Normal supply breakers

C. Sustained undervoltage for 9 seconds will open the normal bus feed breaker. Undervoltage on any bus will start all EDGs. The output breaker must be manually closed to re-energize the bus.
These actions ensure proper voltage on the Vital Instrument Buses that may be energized from the alternate source

D. Sustained undervoltage for 9 seconds will start the EDGs. The normal bus feed breaker must be manually opened and the EDG output breakers must be manually closed.
These actions ensure proper voltage on the Vital Instrument Buses that may be energized from the alternate source

Answer: A

Explanation/Justification:

A. Correct. Sustained undervoltage for 180 seconds will open the normal bus feed breaker. Undervoltage on any bus will start all EDGs. Without a reactor trip, the output breaker must be manually closed to re-energize the bus. The protection provided is low voltage/high current for the system motors.

B. Incorrect. Plausible - Sustained undervoltage for 180 seconds will not directly start the EDGs, it does open the normal feed breaker and the undervoltage created starts the EDGs. The protection provided is low voltage/high current for the system motors.

C. Incorrect. Plausible - Sustained undervoltage for 9 seconds will open the normal bus feed breaker if an SI signal is present. Undervoltage on any bus will start all EDGs. Without a reactor trip, the output breaker must be manually closed to re-energize the bus. The protection provided is low voltage/high current for the system motors not vital bus voltage.

D. Incorrect. Plausible - Sustained undervoltage for 9 seconds will not directly start the EDGs, it does open the normal feed breaker and the undervoltage created starts the EDGs. The protection provided is low voltage/high current for the system motors not vital bus voltage.

Technical References:	Syst Desc 27.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EDS01 15 I2LP-ILO-EDS01 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#	1	
	Group#	1	
	K/A#	00WE04A202 Ability to determine and interpret the following as they apply to the LOCA Outside Containment: - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
	Importance	3.6	4.2

Question # 16

The crew has completed the actions of ECA-1.2, LOCA Outside Containment.

- Pressurizer level is 35% and rising.
- Steam Generator narrow range levels are 30%.
- Subcooling is 35°F.
- RCS pressure is 1700 psig and rising.

Which ONE (1) of the following procedures will be performed next?

A. ES-1.1, SI Termination.

B. E-0, Reactor Trip or Safety Injection.

C. E-1, Loss of Reactor or Secondary Coolant.

D. ECA-1.1, Loss of Emergency Coolant Recirculation.

Answer: C

Explanation/Justification:

Incorrect. Plausible because SI Termination criteria are satisfied with the exception of RCS pressure; however no direct transition to ES-1.1 from ECA-1.2

Incorrect. Plausibe because ECA-1.2 can be entered from E-0 (step 22) and candidate may believe that the transition is back to procedure and step in effect; however, there is no transition to E-0.

Correct, because pressure is rising, transition is to E-1. All SI termination are satisfied, so from E-1, the transition to ES-1.1 will be made.

Incorrect. Plausible a transition to ECA-1.1 if lowering is made if pressure is lowering.

Technical References:	2-ECA-1.2 3-ECA-1.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPC12 5
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#	1	
	Group#	1	
	K/A#	00WE05K101 Knowledge of the operational implications of the following concepts as they apply to the Loss of Secondary Heat Sink: - Components, capacity, and function of emergency systems	
	Importance	3.8	4.1

Question # 17

A Reactor Trip occurred after a 200 day continuous run at 100% power. Following the trip, ALL AFW flow was lost and the Team transitioned to FR-H.1, Loss of Secondary Heat Sink. Due to distractions caused by a pressure channel failure, bleed and feed steps were NOT initiated until WR S/G levels were ALL <10%.

Which one of the following correctly describes the general consequence of the delay?

A. Core uncovery will be MORE severe due to a Pressurizer Safety lifting, INCREASING the loss of mass, while ECCS flow is limited by RCS pressure.

B. Core uncovery will NOT occur as long as one PZR PORV is OPEN, one charging pump is injecting prior to SG dryout and one PRZR Safety is available.

C. Core uncovery will NOT occur as long as both PZR PORVs are OPEN and two charging pumps are injecting prior to SG dryout.

D. Core uncovery will be MORE severe because RCS pressure will remain at a HIGHER value for a longer time, limiting ECCS flow.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because core uncovery will be more severe, but not because of lifting a Safety Valve and failure to reseat. It will occur because PORV flow to power ratio at IP2 is less than 177 lbm/hr/Mwt.

B. Incorrect. Plausible because initiating Bleed and Feed before SG dryout minimizes core uncovery it does not necessarily "prevent" uncovery. In addition, the procedure is based on opening BOTH PORVs not just one.

C. Incorrect. Plausible because for plants with PORV flow to power ratio greater than 177 lbm/hr/Mwt this statement would be correct. At IP2 the ratio is less than 177 lbm/hr/Mwt and Bleed and Feed must be established with SG inventory for heat removal.

D. Correct. At IP2 the ratio is less than 177 lbm/hr/Mwt and Bleed and Feed must be established with SG inventory for heat removal to prevent severe core uncovery.

Technical References:	2-FR-H.1 2-FR-H.1 BG 3-FR-H.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPFH1 4 I2LP-ILO-EOPFH1 5

Question Source:	Bank
Question History:	Unit 3 NRC 2006
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	00WE112127 Conduct of Operations - Knowledge of system purpose and or function.	
	Importance	3.9	4

Question # 18

The operating crew is performing 2-ECA-1.1 for a loss of emergency coolant recirculation. The crew is depressurizing all intact SGs to inject SI accumulators. In this procedure the accumulators perform which of the following functions and at what pressure do we stop depressurizing SGs?

A. Rapidly Inject into the RCS when RCS pressure decreases below pressure in the accumulator. Will flood the core rapidly to maintain core cooling.
Stop depressurizing at 200 psig

B. Slowly Inject into the RCS when RCS pressure decreases below pressure in the accumulator. Will flood the core slowly such that the accumulator water injection is minimized to extend the time to depletion.
Stop depressurizing at 200 psig

C. Rapidly Inject into the RCS when RCS pressure decreases below pressure in the accumulator. Will flood the core rapidly to maintain core cooling.
Stop depressurizing at 100 psig

D. Slowly Inject into the RCS when RCS pressure decreases below pressure in the accumulator. Will flood the core slowly such that the accumulator water injection is minimized to extend the time to depletion.
Stop depressurizing at 100 psig

Answer: B

Explanation/Justification:

A Incorrect. Plausible because 200 psig is correct but the intent in ECA-1-1 is to slowly depressurize the SG pressure so that accumulator water injection is minimized. SI accumulators are still available so they have not injected yet.

B Correct

C Incorrect. Plausible because the SI accumulators could inject on a large break LOCA to rapidly fill the core, but due to the fact the SI accumulators are still available we are in the procedural step to slowly inject water from the SI accumulators. Incorrect because 100 psig is the wrong value

D Incorrect. Plausible because the reason is correct but 100 psig is wrong.

Technical References: 2-ECA-1.1
2-ECA-1.1 BG

Proposed References to be provided: None

Learning Objective I2LP-ILO-SIS01 2

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000001K102 Knowledge of the operational implications of the following concepts as they apply to Continuous Rod Withdrawal: - SUR	
	Importance	3.6	3.9

Question # 19

Given the following:

- The reactor is critical at the 10^{-8} amps.
- The ATC withdraws control rods to continue power increase.
- Control rods continue to move after the In-Hold-Out switch is released

Which of the following identifies the INITIAL indications for the event in progress?

	SUR	PRZR Level	Tavg
A.	Increase	Increase	Increase
B.	Stable	Increase	Increase
C.	Increase	Stable	Stable
D.	Stable	Stable	Increase

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because these indications are correct if the continuous rod withdrawal occurred > POAH.

B. Incorrect. Plausible because candidate may believe that the increase in Tavg will offset the reactivity from the rods. Below the POAH Tavg and PRZR level will not increase.

C. Correct. SUR will continue to increase and PRZR Level and Tavg will not change below the POAH.

D. Incorrect. Plausible because the candidate must know the reactor is below the point of adding heat. Tavg will not increase.

Technical References:
Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPROD 5

Question Source: New

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#	1	
	Group#	2	
	K/A#	000028K202 Knowledge of the interrelations between the Pressurizer Level Control Malfunctions and the following: - Sensors and detectors	
	Importance	2.6	2.7

Question # 20

Given the following:

- Plant power is 100% and stable
- All control systems are in normal full power automatic alignment.
- Plant systems are aligned for full power lineup
- Various alarms come in at approximately the same time, including:
    - "PRESSURIZER LOW LEVEL 18% 5%"
    - "PRESSURIZER LO-LO LEVEL CHANNEL TRIP 5%"
    - "PZR HEATER GROUP TRIPPED"
    - "RCS REDUCED INVENTORY"

Which ONE of the following events would account for this sequence of alarms?

A. Loss if instrument power to the charging pump controller.

B. The controlling Pressurizer Level channel detector has failed LOW.

C. The controlling Pressurizer Level channel detector has failed HIGH.

D. The PT-135,LP letdown pressure fails HIGH.

Answer: B

Explanation/Justification:

A: Incorrect, Plausible because pressurizer level will lower on a loss of a charging pump controller but it will not fall fast enough to get the Pressurizer low level alarm and Pressurizer lo-lo level channel trip at the same time. The student must also realize that the loss of instrument power to the controller will cause the charging pump to go to minimum speed.

B: Correct

C: Incorrect Plausible because the charging pump will slow down and pressurizer level will lower but it will not fall fast enough to get the Pressurizer low level alarm and Pressurizer lo-lo level channel trip at the same time.

D: Incorrect, Plausible because this will increase letdown flow causing pressurizer level to lower, but it will not fall fast enough to get the Pressurizer low level alarm and Pressurizer lo-lo level channel trip at the same time.

Technical References: 2-AOP-INST-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSPZR 11

Question Source: Modified

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#	2	
	K/A#	000032A101 Ability to operate and/or monitor the following as they apply to the Loss of Source Range Nuclear Instrumentation: - Manual restoration of power	
	Importance	3.1	3.4

Question # 21

A reactor trip has occurred from 100% power approximately. As power decays, which ONE of the following describes (1) the condition that would prevent the Source Range instruments from energizing automatically when required, and (2) what action is directed by ES-0.1 Reactor Trip Response?

A. (1) Undercompensated Intermediate Range
(2) Place HV Manual On/Off switch to NORMAL

B. (1) Overcompensated Intermediate Range
(2) Place HV Manual On/Off switch to NORMAL

C. (1) Undercompensated Intermediate Range
(2) Depress both IR Train A and B Permissive Defeat Pushbuttons

D. (1) Overcompensated Intermediate Range
(2) Depress both IR Train A and B Permissive Defeat Pushbuttons

Answer: C

Explanation/Justification:

A. Incorrect. Plausible compensation is correct; however, placing the HV Manual ON/OFF switch to normal would not re-energize the source ranges. Placing the switch to ON would re-energize the source ranges NIs.

B. Incorrect. Plausible candidate must recognize compensation is incorrect and, placing the HV Manual ON/OFF switch to normal would not re-energize the source ranges. Placing the switch to ON would re-energize the source ranges NIs.

C. Correct. IR NIS Undercompensated will prevent automatic re-energizing the SR NIs. Also, must depress both defeat pushbuttons.

D. Incorrect. Plausible because the operator must depress both defeat pushbuttons; however the candidate must recognize that compensation is incorrect.

Technical References:	2-ES-0.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICEXC 10
Question Source:	Modified
Question History:	Beaver Valley 2007 NRC
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#	000067A106 Ability to operate and/or monitor the following as they apply to the Plant Fire on Site: - Fire alarm	
	Importance	3.5	3.7

Question # 22

Given the following:

- The plant is operating at 100 percent Turbine power
- SMF DELUGE SYSTEM ACTIVATED alarm annunciated
- SOF 21 MAIN XFMR DELUGE SYS TROUBLE alarm annunciated
- The Rover reports that there is a fire at the 21 Main Transformer BUT the deluge system has not activated

Which ONE (1) of the following statements describe the actuation of the deluge system?

A. Actuates ONLY by manual actions locally

B. Automatically actuates with high temperature ONLY

C. Automatically actuates when smoke is detected inside the Main Transformer and NO Main Transformer voltage

D. Automatically actuates with high temperature and NO Main Transformer voltage

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because Local Manual actuation is available. Since actuation is not automatic if the unit is on the line, the candidate may believe that Local Manual action is required.

B. Incorrect. Plausible because High Temperature is the input to the deluge system; however, the unit must be off-line for the system to actuate.

C. Incorrect. Plausible because the unit must be off-line for the system to actuate. Candidate must remember that High Temperature NOT smoke is required for actuation.

D. Correct. Both High Temperature and No Voltage on the transformer are required for the deluge system to actuate automatically.

Technical References: 2-ARP SOF
Proposed References to be provided: None

Learning Objective I2LP-ILO-FPS001 7

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#	2	
	K/A#	000074K201 Knowledge of the interrelations between the Inadequate Core Cooling and the following: - RCP	
	Importance	3.6	3.8

Question # 23

Which of the following is correct regarding the operation of Reactor Coolant Pumps in FR-C.1, Response to Inadequate Core Cooling?

A. RCPs are not started unless adequate support conditions exist.
RCPs are started regardless of SG level

B. RCPs are started regardless of support conditions
RCPs are not started unless SG level is adequate

C. RCPs are not started unless adequate support conditions exist.
RCPs are not started unless SG level is adequate

D. RCPs are started regardless of support conditions
RCPs are started regardless of SG level

Answer: B

Explanation/Justification:

A: Incorrect Plausible because student may believe SG level has no bearing on starting RCPs and A was picked on a validation exam

B: Correct

C: Incorrect Plausible because RCPs are not started unless SG level is adequate

D: Incorrect Plausible because RCPs are started regardless of support conditions

Technical References:	2-FR-C.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPFC1 6
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#	2	
	K/A#	000076A202 Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: - Corrective actions required for high fission product activity in RCS	
	Importance	2.8	3.4

Question # 24

Given the following:

- Unit 2 is at 100% power.
- 2-AOP-HIACT-1, "High RCS Activity," has been implemented due to an increase in RCS activity.

WHICH ONE of the following is the required action and reason for the adjustment?

A. Decrease letdown to minimum to minimize the radioactive letdown that is flowing throughout the auxiliary building.

B. Conduct a Feed and Bleed of the RCS by diverting Letdown and initiating a continuous makeup to the VCT to rapidly reduce activity levels

C. Increase letdown flow to maximum so that more water can flow through the letdown mixed bed demineralizers.

D. Place Cation bed demineralizer in service and remove mixed bed demineralizer to remove fission products from the RCS.

Answer: C

Explanation/Justification:

A: Incorrect Plausible because minimizing radiation levels is a good thing, but does not meet intent of background documents

B: Incorrect Plausible because student may believe the waste management system is the correct place to put the water and that feed and bleed will rapidly reduce radiation levels.

C: Correct

D: Incorrect Plausible because placing the cation bed demineralizer in service is an action in AOP; never removing the mixed bed is not an action.

Technical References:	2-AOP-HIACT-1 3-AOP-HIACT-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RCS001 9
Question Source:	Modified
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#	2	
	K/A#	00WE03K302 Knowledge of the reasons for the following responses as they apply to the LOCA Cooldown and Depressurization: - Normal, abnormal and emergency operating procedures associated with LOCA Cooldown and Depressurization	
	Importance	3.4	3.9

Question # 25

The crew is performing ECCS reduction in ES-1.2, Post LOCA Cooldown and Depressurization. One SI pump has been stopped.

Which of the following describes how the required subcooling changes and the basis for the amount of subcooling required for securing the second SI pump?

A. Required Subcooling increases to compensate for the anticipated void formation after the second pump is stopped.

B. Required Subcooling increases to ensure the RCS will remain subcooled after the second SI pump is stopped.

C. Required Subcooling decreases due to decreased break flow after stopping the second pump.

D. Required Subcooling decreases to allow pressure to decrease sufficiently after stopping the second pump to place RHR cooling in service.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because required subcooling increases; however, no void formation is expected or should exist because the RCS is subcooled.

B. Correct. because throttling SI flow is not practical, pumps must be stopped. As pumps are stopped, a step decrease in flow is experienced. RCS pressure will decrease to reach equilibrium with break flow and ECCS flow. RCS subcooling and pressure control must be maintained as the reduction takes place. As flow is reduced, a large allowance is needed.

C. Incorrect. Plausible because breakflow does decrease after stopping each pump; however, subcooling requirement increases.

D. Incorrect Plausible because the most likely exit from ES-1.2 is starting an RHR pump in injection mode; however, subcooling requirement increases.

Technical References:	2-ES-1.2 3-ES-1.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPS12 1
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#	1	
	Group#	2	
	K/A#	00WE10A202 Ability to determine and interpret the following as they apply to the Natural Circulation with Steam Void in Vessel with/without RVLIS: - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
	Importance	3.4	3.9

Question # 26

The following plant conditions exist during a natural circulation cooldown:

- Three (3) CRDM cooling fans are running
- RCS cooldown rate is 22°F / hr
- PRZR Low Pressure SI is blocked
- Auxiliary Spray is in service to depressurize the RCS
- RCS subcooling is 95°F
- One (1) Charging pump is running in Manual
- Charging flow is equal to Letdown flow
- CST Level is 19 feet

The team is depressurizing the plant to 750 psig. As RCS pressure decreases to less than 1200 psig, a rapid increase in Pressurizer level is noted.

Based on changing plant conditions, what actions should the team take at this time?

A. Stop the depressurization and re-pressurize the RCS to collapse the voids and continue the cooldown.

B. Continue the depressurization and transition to ES-0.4, Natural Circulation Cooldown with Steam Voids in Vessel (without RVLIS).

C. Stop the depressurization rate and increase the cooldown rate to regain subcooling.

D. Continue the depressurization and transition to ES-0.3, "Natural Circulation Cooldown with Steam Voids in the Vessel (with RVLIS)".

Answer: A

Explanation/Justification:

A. Correct. Background document for ES-0.2. If a void formation occurs during the RCS depressurization, the pressurization should be stopped. The RCS should be re-pressurized to collapse the voids and the cooldown continued.

B. Incorrect. Plausible because Procedure ES-0.4 addresses conditions for Natural Circ Cooldown with voids (without RVLIS). This procedure is used when a more rapid cooldown is necessary. Since adequate CST level exists, this procedure is not required.

C. Incorrect. Plausible because stopping the cooldown is correct; repressurization is the mechanism to restore subcooling not increased cooldown.

D. Incorrect. Plausible because Procedure ES-0.3 addresses conditions for Natural Circ Cooldown with voids (with RVLIS). This procedure is used when a more rapid cooldown is necessary. Since adequate CST level exists, this procedure is not required

Technical References: 2-ES-0.2
Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPS01 3

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#	1	
	Group#	2	
	K/A#	00WE14K103 Knowledge of the operational implications of the following concepts as they apply to the High Containment Pressure: - Annunciators and conditions indicating signals, and remedial actions associated with the High Containment Pressure	
	Importance	3.3	3.6

Question # 27

The following plant conditions exist:

- A Large Break Loss of Coolant Accident occurred.
- Bus 5A faulted when safeguards loads began loading on.
- 22 Containment Spray Pump tripped after running for 10 minutes.
- Procedure in effect E-1, "Loss of Reactor or Secondary Coolant".
- STEAM FLOW HI OR CNTMT PRESS HI HI SI is in alarm
- Containment pressure is 25 psig and increasing.
- Containment Radiation level indicates 2 R/hr.

The Team transitions to FR-Z.1, "Response to High Containment Pressure" and upon completion of all steps in FR-Z.1, containment pressure is still 25 psig and stable.

At this point, you are required to:

A. Remain in FR-Z.1. Continue actions to establish minimum containment cooling.

B. Exit FR-Z.1 and return to E-1, "Loss of Reactor or Secondary Coolant" at the step in effect.

C. Suspend FR-Z.1. When transition to ES-1.3, Transfer to Cold Leg Recirculation is made, establish recirc spray.

D. Exit FR-Z.1 and enter FR-Z.3, Response to Containment High Radiation and place iodine filter fan units in service.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because FR-Z.1 is unique because when all actions in FR-Z.1 are complete, the procedure is exited regardless of plant conditions.

B. Correct.

C. Incorrect. Plausible because AOPs may be suspended and other procedure actions performed; however, with the exception of FR-Z.1, actions in FR procedures are continued until a success path is achieved or a higher priority FR is entered.

D. Incorrect. Plausible because radiation level is elevated (not at the FR-Z.3 entry condition); however, FR-Z.3 is a yellow path procedure and yellow path procedure are generally entered as time permits.

Technical References:	2-FR-Z.1 2-FR-Z.1 BG OAP-012
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPFRZ 11
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	003000K201 Knowledge of bus power supplies to the following: - RCPS	
	Importance	3.1	3.1

Question # 28

The Main Generator just tripped due to a pilot wire transfer trip from Buchanan. The 25X sync check relay which ensures synchronization between 6.9 KV bus 6 and 6.9 KV busses 3 and 4 for the auto transfer has failed. All other circuits are intact. Which of the following describes the affect to the Reactor Coolant Pumps (RCP)?

A. Only 21 and 24 RCPs will be operating

B. Only 22 and 23 RCPs will be operating

C. Only 23 and 24 RCPs will be operating

D. Only 21 and 23 RCPs will be operating

Answer: A

Explanation/Justification:

21 RCP is powered from Bus 1
22 RCP is powered from Bus 4
23 RCP is powered from Bus 3
24 RCP is powered from Bus 2

The failure of the Sync Check Relay results in a loss of buses 3 & 4.

A. Correct
B. Incorrect
C. Incorrect
D. Incorrect.

Technical References:	2-AOP-138KV-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RCSRCP 6
Question Source:	Modified
Question History:	Unit 3 NRC 2006
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 3

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	003000A404 Ability to manually operate and/or monitor in the control room: - RCP seal differential pressure instrumentation	
	Importance	3.1	3

Question # 29

Given the following:

- The plant is in Mode 5
- Vacuum Refill is complete with a bubble in the Pressurizer
- Preparations are underway to start 24 RCP
- RHR is in service

Which **ONE** of the following sets of parameters will **ALLOW** starting of the **24** RCP in accordance with SOP-1.3, Reactor Coolant Pump Startup and Shutdown?

	RCS Pressure	VCT Pressure	Seal Injection Flow
A.	375	25	8
B.	350	17	10
C.	300	15	11
D.	330	27	3

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because the VCT pressure and Seal Injection Flows are satisfactory; however, RCS pressure is too high in accordance with 2-POP-4.1. Candidates must remember that RHR is still in service.

B. Correct.

C. Incorrect. Plausible because the VCT pressure and Seal Injection Flows are satisfactory; howeverRCS pressure is too low (< 325) for RCP operations.

D. Incorrect. Plausible because RCS Pressure and VCT pressure are satisfactory. Seal injection flow is too low; however, this value is allowed when all RCPs are secured and it is necessary for inventory balance.

Technical References: 2-SOP-1.3
Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSRCP 10

Question Source: Modified

Question History: Votgle NRC 2009

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#	004000A311 Ability to monitor automatic operation of the CVCS, including: - Charging/letdown	
	Importance	3.6	3.4

Question # 30

Due to a failure of NRHX CCW temperature control valve (TCV-130), letdown temperature rises to 145 F. Which of the following describes the potential plant response to the event with no operator action?

A. TCV-149 diverts flow to bypass the demineralizers and reactor coolant filter.

B. TCV-149 diverts flow to bypass the demineralizers.

C. LCV-459 will isolate Letdown on high temperature

D. LCV-112 will divert Letdown to the CVCS HUT on high temperature

Answer: B

Explanation/Justification:

A: Incorrect. Reactor coolant filters are not bypassed. Plausible because the candidate may think flow bypasses the demineralizers and filter. The diverted flow comes in just upstream of the filter between the demineralizers and the filter.

B: Correct

C: Incorrect. Plausible because this will protect the demineralizers from high temperature but this is not what happens.

D: Incorrect. Divert setpoint is 145. Plausible because it does divert flow to bypass the demineralizers.

Technical References:	Syst Desc 3
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-CVCS j
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#	004000A235 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Reactor trip	
	Importance	3.3	3.8

Question # 31

Given the following:

- The plant had a reactor trip from 100% power.
- The main turbine failed to automatically trip.
- The main turbine was manually tripped.
- Safety injection has not actuated.
- Safety injection is required.
- RCS temperature is currently 520°F.

What is the current status of charging and letdown?

A. Letdown unchanged. Charging flow unchanged

B. Letdown unchanged. Charging flow increased.

C. Letdown flow is Zero. Charging flow unchanged.

D. Letdown flow is Zero. Charging flow increased.

Answer: D

Explanation/Justification:

A Incorrect. Letdown will be isolated due to pressurizer level less then 18%. Plausible because on an uncomplicated reactor trip letdown will still be in service.

B Incorrect Letdown will be isolated due to pressurizer level less then 18%. Plausible because on an uncomplicated reactor trip letdown will still be in service. Charging flow will be at maximum to recover pressurizer level.

C Incorrect Charging flow would be at maximum to recover pressurizer level. Plausible because Letdown would be isolated and charging flow could be unchanged on a reactor trip.

D Correct

Technical References: Syst Desc 3
Proposed References to be provided: None

Learning Objective I2LP-ILO-CVCS 9a

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#	005000K203 Knowledge of bus power supplies to the following: - RCS pressure boundary motor-operated valves	
	Importance	2.7	2.8

Question # 32

Given the following:

- An RCS cooldown is in progress.
- RCS Temperature is 176°F
- RCS Pressure is 309 psig
- RHR is in service
- Valves 730 and 731 are currently energized
- 21 EDG tagged out

A loss of offsite power occurred and PT-402 failed high

Which of the following describes the status of the RHR suction Valves 730 and 731?

A. Both Valves are de-energized
Both Valves are open

B. Both Valves are energized
One valve is close

C. One Valve is energized
Both valves are open

D. One valve is energized
One valve is closed

Answer: C

Explanation/Justification:

730 is powered from MCC-26A and 731 is powered from MCC-26B which are powered from bus 5A and 6A respectively. With 21 EDG OOS, bus 5A is de-energized after the LOOP.

A. Incorrect. Plausible because the candidate must remember that MCC-26A is de-energized due to LOOP and 21 EDG OOS.

B. Incorrect. Plausible because the candidate must remember that MCC-26A is de-energized due to LOOP and 21 EDG OOS. In addition the candidate must remember that the pressure interlock with PT-402 and 403 prevents opening but does not auto close the valves.

C. Correct. MCC-26A will be de-energized thus 730 is de-energized.

D. Incorrect. Plausible because one valve is energized; however, the pressure interlock with PT-402 and 403 prevents opening but does not auto close the valves.

Technical References: 2-SOP-4.2.1
Proposed References to be provided: None

Learning Objective I2LP-ILO-RHR001 9

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#	006000K501 Knowledge of the operational implications of the following concepts as they apply to the ECCS: - Effects of temperatures on water level indications	
	Importance	2.8	3.3

Question # 33

Given the following:

- A small break LOCA has occurred
- Containment pressure is 11 psig
- Containment temperature is 240° F

What assumptions are made regarding S/G level indication during this condition?

A. Indicated level will be lower than actual level due to change in density of water in the reference leg.

B. Indicated level will be lower than actual level due to higher pressure exerted on the reference side of the D/P detector

C. Indicated level will be higher than actual level due to change in density of water in the reference leg.

D. Indicated level will be higher than actual level due to higher pressure exerted on the reference side of the D/P detector

Answer: C

Explanation/Justification:

A Incorrect: Plausible because the density of the water has changed but level will be higher.

B Incorrect: Plausible because pressure inside containment is higher than normal and may influence detector output but this is not the correct answer, it is due to the density of the water in the reference leg changing.

C Correct

D Incorrect: Plausible because indicated level will be higher then actual but it is for the wrong reason.

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

Learning Objective I2LP-ILO-SGS001 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#	007000A410 Ability to manually operate and/or monitor in the control room: - Recognition of leaking PORV/code safety	
	Importance	3.6	3.8

Question # 34

The Unit is operating at 100% power when you observe the following plant conditions:

- PZR pressure lowering.
- PZR level slowly rising
- 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 leak within the capacity of the charging system.

B. A leaking PORV.

C. A steam line break that is within the capacity of the SGWLCS.

D. A SG Tube leak.

Answer: B

Explanation/Justification:

A Incorrect RCS vessel leak would cause PZR level to go down

B Correct

C Incorrect PZR level would go down, reactor power would increase

D Incorrect SG pressure and level are normal

Technical References:	2-AOP-LEAK-1 Syst Desc 1.4
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-AOPLEK 2 I2LP-ILO-RCSPZR 5

Question Source:	Modified
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#	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 following:

- 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
Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSPZR 11d

Question Source: Bank

Question History: Unit 2 NRC 2001

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#	008000K409 Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: - The "standby" feature for the CCW pumps	
	Importance	2.7	2.9

Question # 36

Given the following:

- The plant is in a refueling outage.
- Shutdown cooling is in service.
- The Auto Start Bypass Switch is in Bypass
- 21 and 23 CCW pumps are running.

The reactor operator notices that CCW flow is 4500 gpm and lowering. The Reactor Operator sends an NPO to check CCW Pump discharge pressure locally and receives a report that the local pressure gauge indicates pressure is 110 psig and lowering.

Assuming NO Operator action, which one of the following describes the operation of the CCW pumps under these conditions?

A. 22 CCW pump will automatically start when CCW pressure lowers to 107 psig.

B. 22 CCW pump will automatically start when CCW pressure lowers to 80 psig.

C. 22 CCW pump will automatically start after 9 second delay following 21 or 23 CCW pump breaker trip

D. 22 CCW pump will automatically start when RHR temperature exceeds 185°F

Answer: B

Explanation/Justification:

A Incorrect: Plausible because 107 psig is the setpoint with two CCW pumps running

B Correct

C Incorrect Plausible because student may believe there is currently a reason for 22 CCW pump to autostart on breaker tripping.

D Incorrect Plausible because student may believe there is an autostart based on RHR temperature.

Technical References:	2-SOP-4.1.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-CCW001 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#	1	
	K/A#	010000A202 Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Spray valve failures	
	Importance	3.9	3.9

Question # 37

Given the following:

- Unit 2 is performing a plant startup and power ascension
- Reactor power is at 15%
- Pressurizer Spray Valve PCV-455A has failed open
- The Reactor has been tripped
- The Turbine has been tripped

What actions will be required by the operators?

A. Stop RCP 21 AND 22

B. Stop RCP 23 AND 24

C. Stop RCPs 21 AND 22 AND 23

D. Stop RCPs 22 AND 23 AND 24

Answer: D

Explanation/Justification:

A Incorrect: Plausible because RCPs are stopped, but student must know which RCPs are stopped.

B Incorrect: Plausible because RCPs are stopped, but student must know which RCPs are stopped.

C Incorrect: Plausible because RCPs are stopped, but student must know which RCPs are stopped.

D Correct

Technical References:	2-ARP-SAF
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RCSPZR 13
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 3

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	012000K604 Knowledge of the effect of a loss or malfunction of the following will have on the RPS: - Bypass-block circuits	
	Importance	3.3	3.6

Question # 38

Given the following:

- A plant load reduction is in progress.
- Turbine First Stage Pressure Channel, PT-412B, sticks at 50%.
- Reactor power is currently 8%.

Which ONE of the following identifies the RPS permissive affected by this transmitter failure, including the MINIMUM number of RCPs, which if lost, would cause a Reactor Trip?

A. P-7 cannot be satisfied; the reactor would trip on loss of ONLY 1 RCP.

B. P-8 cannot be satisfied; the reactor would trip on loss of ONLY 1 RCP.

C. P-7 cannot be satisfied; the reactor would trip on loss of 2 RCPs.

D. P-8 cannot be satisfied; the reactor would trip on loss of 2 RCPs.

Answer: C

Explanation/Justification:

A Incorrect. The first part is true, P-7 cannot be satisfied in the current plant condition, because one impulse pressure channel is stuck above 8%. P-7 requires input from P-10. The second part is incorrect but plausible because P-8 inputs the loss of flow trip on 2 RCPs.

B Incorrect. Plausible because the impulse channel is stuck at a value higher than the P-8 power value. P-8 is input by power range instrumentation. Also plausible because if the first half was true, the second half would also be true, because P-8 is the permissive for the loss of flow trip - 1 RCP.

C Correct. P-7 cannot be satisfied because it takes 2/2 impulse pressures <8% for P-7 to be active. P-10 is active because 3/4 PR NIs are below 10%, but only solves half of the input for P-7 to be active.

D Incorrect. As described above P-8 is a function of NIS only. Low flow trip combination is incorrect, but could be chosen based purely on logic that with power between 10% and 30% is the range for 2/3 lo flow trip.

Each reactor coolant loop has three flow measuring circuits that generate a low flow trip signal if any two of the three circuits sense flow below 90% of normal full flow. The low flow trip signal from each loop is used in two logic circuits. The first circuit is used to trip the reactor if reactor power is above 18% power (Permissive P-8 not activated) and flow is lost in one or more loops. The second circuit will trip the reactor if power is above 8% (P-7 inactivated) and flow is lost in two or more loops.

Technical References:
Proposed References to be provided: None

Learning Objective I2LP-ILO-ICRXP 7

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#	1	
	K/A#	013000K302 Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: - RCS	
	Importance	4.3	4.5

Question # 39

Given the following:

- The plant was operating at 100% power.
- A reactor trip occurs.
- The Average Tavg failed at a value of 555°F
- All other system function as design

Which of the following will cause an excessive RCS cooldown as a direct result of this failure?

A. FRV Motor operated isolation valves will NOT close.

B. Main Feed regulating valves will NOT close.

C. Pressurizer level will continue to increase until solid.

D. Main Boiler Feed Pumps will NOT trip automatically.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because FRV Motor Operated Valves receive a feedwater isolation signal on an SI or HI HI SG level; however, they do not receive a feedwater isolation signal on Reactor trip with Low Tavg

B. Correct. The Main Feed Reg Valves receive a feedwater isolation (close) signal on a Reactor Trip with Low Tavg. On a simple Reactor trip the Main Boiler Feed Pumps will not trip, SG levels will shrink and the SGWLC system will call to open the FRVs resulting in an excessive RCS cooldown.

C. Incorrect. Plausible because pressurizer level will increase but will not go solid.

D. Incorrect. Plausible because the Main Boiler Feed Pumps will trip on a Safety Injection or HI HI SG level Feed Water Isolation Signal, but will not trip on a Reactor Trip with a Low Tavg.

Technical References:
Proposed References to be provided: None

Learning Objective I2LP-ILO-ESS001 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#	022000K101 Knowledge of the physical connections and/or cause-effect relationships between the CCS and the following systems: - SWS/cooling system	
	Importance	3.5	3.7

Question # 40

Given the following:

- The plant is operating at 100% power
- 21, 23, and 25 FCUs are in service to provide containment cooling

Subsequently, the reactor trips and a loss of Off-Site power occurs. All equipment functioned as designed.

Which one of the following describes the resulting Containment Cooling lineup?

A. FCUs must be manually started. Cooling water flow is maintained by TCV-1103.

B. All FCUs will be in service. Cooling water flow is maintained by TCV-1103.

C. Only 21, 23, and 25 FCUs will be in service. Cooling water flow is raised by providing a Service Water flow path by automatically opening TCV-1103 bypass valves.

D. FCUs must be manually started. Cooling water flow is raised by providing a Service Water flowpath by automatically opening TCV-1103 bypass valves.

Answer: A

Explanation/Justification:

A Correct

B Incorrect: Plausible because cooling water is maintained by TCV-1103 but FCUs must be manually started

C Incorrect: Plausible because 21, 23 and 25 FCU were originally in service and student may believe they will restart automatically.

D: Incorrect: Plausible because FCUs must be manually started but cooling water is maintained by TCV-1103.

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

Learning Objective I2LP-ILO-VCCARC 13

Question Source: Bank

Question History: Unit 2 NRC 2004

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#	012000K501 Knowledge of the operational implications of the following concepts as they apply to the RPS: - DNB	
	Importance	3.3	3.8

Question # 41

Which ONE (1) of the following reactor trip signals provides protection against DNB
(Departure from Nucleate Boiling)?

A. Over Power Delta T

B. Over Temperature Delta T

C. 6.9 kV Bus Over-frequency

D. Steam Generator Low Water Level

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Over Power Delta T provides protection for Fuel Integrity.

B. Correct. Input to OT Delta T are Temperature (Tavg), Pressure and Delta Flux.

C. Incorrect. Plausible because 6.9 kV bus Over frequency will trip the RCPs which in turn will trip the reactor > 10% power. This provides protection for excessive flow through the core.

D. Incorrect. Plausible because SG Low Level provides protection for loss of heat sink which will cause temperature to increase.

Technical References:	Tech Specs
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICRXP 6
Question Source:	Modified
Question History:	NRC Ginna 2007
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#	0260002414 Emergency Procedures/Plan - Knowledge of general guidelines for EOP usage.	
	Importance	3.8	4.5

Question # 42

Given the following:

- A large break LOCA has occurred.
- Both RHR Pumps are tripped.
- Both Containment Spray Pumps are running.
- 3 Fan Cooler Units are Running
- Containment Pressure is 21 PSIG, lowering.
- RWST Level is 16 Feet.
- At step 16 of E-1, Loss of Reactor or Secondary Coolant, the crew determined recirculation equipment was not available.
- The crew transitioned to the appropriate procedure.

Which one of the following describes continued operation of the Containment Spray Pumps?

A. Pumps are operated in accordance with FR-Z.1, Response to High Containment Pressure, based on the trend in containment pressure.

B. One pump will be secured in accordance with FR-Z.1, Response to High Containment Pressure, based on the combination of RWST level, Containment Pressure and Fan Cooler Units.

C. Both pumps will be secured in ECA-1.1, Loss of Emergency Coolant Recirculation, based on the trend of containment pressure.

D. Pumps are operated in accordance with ECA-1.1, Loss of Emergency Coolant Recirculation, based on the combination of RWST level, Containment Pressure and Fan Cooler Units.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because conditions to enter FR-Z.1 existed. Candidate must know that when in ECA-1.1, spray pumps are operated in accordance with ECA-1.1 NOT FR-Z.1.

B. Incorrect. Plausible because conditions to enter FR-Z.1 existed. Candidate must know that when in ECA-1.1, spray pumps are operated in accordance with ECA-1.1 NOT FR-Z.1.

C. Incorrect. Plausible because a goal of ECA-1.1 is to conserve RWST inventory, and that securing both pumps will aid in this effort. Also depending on FCUs operating, only one spray pump MAY be secured.

D. Correct. Candidate must recall that the spray pumps are operated in accordance with ECA-1.1 and the parameters monitored to allow securing the pump(s).

Technical References:	2-ECA-1.1 2-ECA-1.1 BG
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPC11 1
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#	1	
	K/A#	039000A204 Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Malfunctioning steam dump	
	Importance	3.4	3.7

Question # 43

The plant has operated at 100% power for the last 90 days. The following indications are observed:

- Reactor power: 100.5% and increasing
- Tavg: 561 °F and decreasing
- Pressurizer Level: 44% and decreasing
- RCS Pressure: 2225 psig and decreasing
- Gross Mwe: 1000 Mwe and decreasing

The operators have entered AOP-UC-1, Uncontrolled Cooldown. Which of the following actions is most likely to terminate the cooldown?

A. Stop any inward rod motion

B. Stop any turbine load increase

C. Initiate actions to stop any boration in progress

D. Dispatch an operator to isolate affected condenser steam dump

Answer: D

Explanation/Justification:

A Incorrect Plausible because Power is increasing so student may believe that rods would be moving inward but temperature is deacreasing.

B Incorrect Plausible because power is increasing but Mwe are decreasing.

C Incorrect Plausible because temperature is decreasing but power is increasing.

D Correct

Technical References: 2-AOP-UC-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-SDSHP 4

Question Source: Bank

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#	2	
	Group#	1	
	K/A#	059000K105 Knowledge of the physical connections and/or cause-effect relationships between the MFW System and the following systems: - RCS	
	Importance	3.1	3.2

Question # 44

Given the following:

- The plant is operating at 95% power,
- Main Steam line pressure transmitter PT-404 fails low,
- NO operator action is taken.

Which ONE of the following describes the response of the plant?

A. Main Boiler Feed Pump (MBFP) speed initially decreases, and then returns to program and RCS temperature initially decreases.

B. MBFP speed initially increases and RCS temperature initially decreases.

C. MBFP speed decreases to minimum FOXBORO signal and RCS temperature initially increases.

D. Main Boiler Feed Pump (MBFP) speed initially decreases, and then returns to program and RCS temperature initially increases.

Answer: C

Explanation/Justification:

A Incorrect: Plausible because student must understand the effect of failure of PT-404 will cause MBFP speed to decrease.

B Incorrect: Plausible because student must understand effect of failure of PT-404 will cause MBFP speed to decrease.

C Correct

D Incorrect: Plausible because temperature increases.

Technical References:	2-AOP-FW-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MFW001 17 I2LP-ILO-MFW001 5

Question Source: Modified

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#	0620002427 Emergency Procedures/Plan - Knowledge of fire in the plant procedure.	
	Importance	3.4	3.9

Question # 45

Given the following:

- A fire has occurred in the 480V switchgear room.
- All 480V buses are de-energized

Which of the following Alternate Safe Shutdown System components can be supplied from 12FD3?

A. 23 Component Cooling Water Pump
23 and 24 Service Water Pumps
23 Charging Pump
23 Auxiliary Boiler Feed Pump
21 and 22 Residual Heat Removal Pump

B. 23 Component Cooling Water Pump
23 Charging Pump
Fan House Instruments
21 or 22 Residual Heat Removal Pump
21 Safety Injection Pump

C. 21 Component Cooling Water Pump
23 Safety Injection Pump
Fan House Instruments
21 or 22 Residual Heat Removal Pump
21 Charging Pump

D. 21 Component Cooling Water Pump
23 Charging Pump
23 and 24 Service Water Pump
21 Safety Injection Pump
21 Auxiliary Boiler Feed Pump

Answer: B

Explanation/Justification:

A. 23 Component Cooling Water Pump Yes Powered from 12FD3
   23 and 24 Service Water Pumps Not Powered from 12FD3
   23 Charging Pump Yes Powered from 12FD3
   23 Auxiliary Boiler Feed Pump Not Powered from 12FD3
   21 and 22 Residual Heat Removal Pump Yes Powered from 12FD3

B. 23 Component Cooling Water Pump Yes Powered from 12FD3
   23 Charging Pump Yes Powered from 12FD3
   Fan House Instruments Yes Powered from 12FD3
   21 and 22 Residual Heat Removal Pump Yes Powered from 12FD3
   21 Safety Injection Pump Yes Powered from 12FD3

C. 21 Component Cooling Water Pump Not Powered from 12FD3
   23 Safety Injection Pump Not Powered from 12FD3
   Fan House Instruments Yes Powered from 12FD3
   21 and 22 Residual Heat Removal Pump Yes Powered from 12FD3
   21 Charging Pump Not Powered from 12FD3

D. 21 Component Cooling Water Pump Not Powered from 12FD3
   23 Charging Pump Yes Powered from 12FD3
   23 and 24 Service Water Pump Not Powered from 12FD3
   21 Safety Injection Pump Yes Powered from 12FD3
   21 Auxiliary Boiler Feed Pump Yes Powered from 12FD3

Technical References: 2-AOP-SSD-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-ASSD 14

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#	061000K601 Knowledge of the effect of a loss or malfunction of the following will have on the AFW System components: - Controllers and positioners	
	Importance	2.5	2.8

Question # 46

Given the following:

- The plant is being started up following a refueling outage
- The plant is at 3.5% power
- 21 and 23 AFW pumps are supplying the Steam Generators
- 21 AFW Pump discharge pressure is 1250 psig
- 23 AFW Pump discharge pressure is 1400 psig
- Level is decreasing in 21 SG and 22 SG
- There are no feedwater leaks in the plant

What is the cause for the SG level decrease?

A. High temperature in the AFW pump room has closed the steam supply valves to the steam driven AFW pump (1310A and 1310B).

B. Reactor power has exceeded the capacity of the AFW system.

C. Low Pressure Cutback circuit has failed causing AFW flow control valves to close.

D. FC-1135A-S, 21 AFW pump suction flow transmitter has failed low.

Answer: D

Explanation/Justification:

A.	Incorrect: Plausible because student may believe the turbine driven AFW pump is being used. High temperature in the auxiliary feedwater pump room will close the steam supply to the Turbine Driven Auxiliary Feedwater pump; however, the turbine driven pump is not running.
B.	Incorrect: Plausible because this is the power level that main feedwater is placed in service and auxiliary feedwater is secured; however, the capacity of the AFW system is greater than 3 percent.
C.	Incorrect: Plausible because this circuit would close the discharge valves but would cause discharge pressure to increase..
D. Correct Low suction flow will cause the recirculation valve to open. The AFW flow control valves are set to maintain 200 gpm to each steam generator which is above the setpoint to cause the valves to close (170 gpm). A failure of the flow control switch (FC-1135A-S) would cause the valve to open under these conditions.

Technical References: Syst Desc 21.2
Proposed References to be provided: None

Learning Objective I2LP-ILO-MFW001 13p

Question Source: Bank

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#	2	
	Group#	1	
	K/A#	062000K303 Knowledge of the effect that a loss or malfunction of the A.C. Distribution System will have on the following: - DC system	
	Importance	3.7	3.9

Question # 47

Given the following:

- 100% power
- A station blackout has occurred
- 125V DC loads on the 24 DC Bus are being supplied by the station batteries

What is the required action or system response for restoration of power to the 24 DC Bus?

A. The 24 Battery Charger will reenergize on restoration of AC power to MCC 27A, since the battery charger is not stripped on the blackout conditions.

B. The sequence timer will load 24 Battery Charger on to the 24 DC Bus following restoration of AC power to MCC 27A.

C. After AC power is restored to MCC 27A, The NPO must be dispatched to manually reenergize the 24 Battery Charger.

D. Dispatch a NPO to reenergize the 24 Battery Charger from an alternate power supply per SOP 27.1.6, “Instrument Bus, DC Distribution System, and PA System Inverter”.

Answer: A

Explanation/Justification:

A. Correct. The supply breaker to MCC27A will strip on any station blackout or SI. The NPO must restore power to the MCC to re-energize the Battery Charger. The supply breaker to the battery charger from the MCC does not strip.

B. Incorrect. Plausible because many loads on safeguards buses sequence on when power is restored to the bus. This is not true for the MCCs.

C. Incorrect. Since many loads breakers trip on an undervoltage condition, candidate may believe that 24 battery charger breaker trips. The candidate may believe that manual action is required to restart the battery charger when power is restored to the MCC.

D. Incorrect. Plausible because SOP-27.1.16 provides direction to align alternate power from Unit 1 power source to Instrument AC buses. Candidate may believe that this capability exists for DC buses also.

Technical References:	Syst Desc 27.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EDS01 15
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#	1	
	K/A#	063000K402 Knowledge of D.C. Electrical System design feature(s) and/or interlock(s) which provide for the following: - Breaker interlocks, permissives, bypasses and cross-ties	
	Importance	2.9	3.2

Question # 48

If DC control power is lost to 480V Bus 5A, WHICH ONE of the following describes the resultant operation of Bus 5A supply breaker, 52/5A and describe how breaker operation would be accomplished?

A. The breaker will remain in the "as is" condition.
Subsequent breaker operation is possible only by local means.

B. The breaker will automatically trip open.
Subsequent breaker closing is possible only by local means.

C. All automatic breaker trips will remain operable.
Remote manual operation of breakers will NOT be possible.

D. All automatic breaker trips will NOT be operable.
Remote manual trip will remain operable.

Answer: A

Explanation/Justification:

A Correct
B Incorrect: Plausible because manual operation will be required to operate breaker but the breaker will remain “as-is”
C Incorrect: Plausible because remote manual operation of breakers will not be possible
D Incorrect: Plausible because all automatic breaker trips will not be operable

Technical References:	2-AOP-DC-1 Syst Desc 27.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EDS03 7
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#	1	
	K/A#	0640002434 Emergency Procedures/Plan - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	
	Importance	4.2	4.1

Question # 49

The Control Room was evacuated due to a fire

If the 480V switchgear room is inaccessible, the conventional side RO is directed to ensure/place ALL EDG control switches to _____? Why?

A. ON, to allow automatic re-energization of 480V buses

B. OFF, to prevent possible overloading EDG if it Auto Starts

C. ON, to ensure power available when CCR is re-entered

D. OFF, to prevent EDG running without service water.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because candidate may believe that it is desirable to automatically re-energize 480V buses automatically when conditions exist.

B. Incorrect. Plausible because switches are placed in OFF; however, the concern is not overloading the diesels.

C. Incorrect. Plausible because equipment powered from the App R diesel is not controllable from the control room.

D. Correct. Switches are place in OFF to prevent overheating the EDGs if they start without service water supplied to cool them.

Technical References: 2-AOP-SSD-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-EDSEDG 15

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#	064000A108 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G System controls including: - Maintaining minimum load on ED/G (to prevent reverse power)	
	Importance	3.1	3.4

Question # 50

Given the following:

- The Plant is operating at 100% power.
- 21 EDG is started for surveillance testing.

Which ONE (1) of the following describes how a reverse power condition is prevented when closing the EDG output breaker?

A. Ensure running and incoming voltages are matched prior to closing the output breaker

B. Ensure synchroscope is rotating slowly in the 'FAST' (clockwise) direction prior to closing the breaker

C. Ensure running and incoming frequencies are matched prior to closing the output breaker

D. Ensure synchroscope is rotating slowly in the SLOW (counterclockwise) direction prior to closing the breaker

Answer: B

Explanation/Justification:

A Incorrect: Plausible because voltages are matched and are part of the power equation but does not answer the question of preventing a reverse power condition.

B Correct

C Incorrect: Plausible because frequency is adjusted with the raise-lower governer control, but does not answer the question of preventing a reverse power condition.

D Incorrect: Plausible because rotating in the slow direction is an option and may be selected by the student buy, Synchroscope is rotating slowly in the fast direction si the correct answer.

Technical References: 2-SOP-27.3.1.1
Proposed References to be provided: None

Learning Objective I2LP-ILO-EDGR 4

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 4

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	073000K501 Knowledge of the operational implications of the following concepts as they apply to the PRM System: - Radiation theory, including sources, types, units, and effects	
	Importance	2.5	3

Question # 51

Given the following:

- A large steam generator tube rupture occurred 15 minutes ago on 21 SG
- Unit 2 had been operating with significant leakage on one fuel assembly
- Operators tripped the reactor and initiated manual safety injection
- On the trip fuel assembly leakage increased
- The team has just closed the MSIV for 21 SG, but has NOT started cooling down the RCS

Which of the following statements is correct regarding 21 Steam Line Radiation Monitor R-28 response at this time?

A. R-28 is designed to ONLY read N-16 gamma radiation, so it will be reading minimum detectable activity (1.0×10^{-3} µCi) at this time.

B. R-28 is designed to ONLY read N-16 gamma radiation, but with significant fuel assembly leakage it will be elevated at this time.

C. R-28 will respond to a wide range of gamma ray energies. However, since there is no steam flow, it will be reading minimum detectable activity (1.0×10^{-3} µCi) at this time.

D. R-28 will respond to a wide range of gamma ray energies, and even without flow there is enough activity in the steam to have elevated readings at this time.

Answer: D

Explanation/Justification:

A. Incorrect because of N-16 reference. Plausible because of possible misconception of these monitors.

B. Incorrect because of N-16 reference. Plausible because of possible misconceptions and the fact that the second part of this distractor is very correct.

C. Incorrect because reading will not be 0 at this time. Plausible because of possible misconceptions about flow input to the monitor. Also plausible because there will be little or no steam flow past the monitor at this time.

D. Correct. Even without steam flow, there will still be high activity in the steam line

Technical References:	Syst Desc 12
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RMS001 6
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
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

Which one of the following describes operation of FCV-1176 and 1176A, Emergency Diesel Generator Service Water Flow Control Valves, on an ESF actuation?

A. Both valves open fully to allow flow through the Jacket Water (JW) and Lube Oil (LO) Heat Exchangers

B. Both valves open fully; FCV-1176 allows flow through the JW Heat Exchanger and FCV-1176A allows flow through the LO Heat Exchanger

C. FCV-1176 opens fully; FCV-1176A remains closed but will open fully at HIGH JW temperature alarm setpoint

D. FCV-1176 opens fully; FCV-1176A remains closed but will open fully at the HIGH JW or HIGH LO temperature alarm setpoint

Answer: A

Explanation/Justification:

A Correct

B Incorrect: Plausible because both valves open fully, but the flowpath is wrong

C Incorrect: Plausible because FCV 1176 does open fully

D Incorrect: Plausible because FCV-1176 does open fully

Technical References: 2-SOP-24.1

Proposed References to be provided:	Syst Desc 24 None
Learning Objective	I2LP-ILO-SW001 11
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 4
Comments	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	076000K302 Knowledge of the effect that a loss or malfunction of the SWS will have on the following: - Secondary closed cooling water	
	Importance	2.5	2.8

Question # 53

Given the following:

- Service Water is aligned for 2 header operations.
- Service Water Header 123 is selected as the essential header.
- Service Water Header 21 22 23 24 25 26 High/Low Pressure alarm annunciated
- 24-25-26 Service Water Pump header pressure is 55 psig and lowering slowly.
- The Conventional NPO reported that TCV-1109 Temperature Control Valve Turbine Hall Closed Cooling has a large leak.
- The leak was isolated by closing TCV-1109 inlet and outlet isolation valves
- The bypass valve around TCV-1109 cannot be opened.

Which of the following describes a consequence of this condition?

A. Manually trip the unit due to loss of cooling to the Main Boiler Feed Pump Lube Oil Coolers

B. Unit Shutdown due to loss of cooling to the Condensate Pump Oil Coolers

C. Unit Shutdown due to loss of cooling to the Generator Hydrogen Coolers

D. Manually trip the unit due to loss of cooling to the Stator Water Coolers

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Turbine Hall Closed Cooling provides cooling to the MBFP pedestal; however NOT the lube oil coolers.

B. Correct.

C. Incorrect. Plausible because the candidate may believe that the "clean" (not brackish water from the river) is preferred for cooling generator components; however, the Main Generator Hydrogen Coolers are cooled by Non-Essential Service Water

D. Incorrect. Plausible because the candidate may believe that the "clean" (not brackish water from the river) is preferred for cooling the stator water; however, the Stator Water Cooling System is cooled by Non-Essential Service Water.

Technical References:
Proposed References to be provided: None

Learning Objective I2LP-ILO-SW001 13

Question Source: New

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#	1	
	K/A#	078000K402 Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: - Cross-over to other air systems	
	Importance	3.2	3.5

Question # 54

A rupture in the Instrument Air System has caused the unit to trip. Even though all compressors are running, and all cross-connect valves are open, Instrument Air Pressure is not sufficient to operate the Auxiliary Boiler Feedpump (ABFP) Feed Reg Valves or the Atmospheric Steam Dumps. What actions should be performed?

A. Engage the local handwheel of these valves and take local manual control.

B. Ensure the backup nitrogen supply to the ABFP Feed Reg Valves is functioning properly.

C. Manually line up nitrogen to the ABFP Feed Reg Valves and ensure they are functioning properly.

D. Manually operate HCV-1118 to control 22 Auxiliary Boiler Feedpump speed to control feed flow.

Answer: B

Explanation/Justification:

A: Incorrect: Plausible because local control of valves could occur but is not desired.

B Correct

C Incorrect: Plausible because nitrogen does back up instrument air to the ABFP Reg valves

D Incorrect: Plausible because students may try to control feed flow with HVC-1118 to feed all SGs.

Technical References:	Syst Desc 21 Syst Desc 29.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MFW001 15f I2LP-ILO-SA01 15
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	103000K108 Knowledge of the physical connections and/or cause-effect relationships between the Containment System and the following systems: - SIS, including action of safety injection reset	
	Importance	3.6	3.8

Question # 55

An inadvertent Safety Injection Actuation (SIA) and automatic Reactor Trip has occurred. It was noted during the performance of E-0, Reactor Trip or Safety Injection, that Letdown Isolation Valve, 201 failed to automatically close as required, and had to be manually closed. SI has subsequently been placed in DEFEAT and has been RESET in E-0. However,Containment Isolation (CIA) Phase A could NOT be reset when attempted.

Which of the following could be a cause for the failure of CIA, Phase A to reset?

A. Letdown Isolation Valve, 201 failed to AUTOMATICALLY close as required.

B. Control switch for the Weld Channel & Penetration Pressurization System (WCPPS) is OPEN.

C. Equipment Hatch Solenoid control switch is in NORM.

D. Isolation Valve Seal Water System valves (1410, 1413, SOV-3518, and SOV-3519) control switches are OPEN.

Answer: C

Explanation/Justification:

A Incorrect: Plausible because a failure did occur with the valve

B Incorrect: Plausible because Weld channel is desired to be open

C Correct

D Incorrect: Plausible because IVSW is desired

Technical References:	Syst Desc 10
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-VCCIS 8
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#	045000K523 Knowledge of the operational implications of the following concepts as they apply to the MT/G System: - Relationship between rod control and RCS boron concentration during T/G load increases	
	Importance	2.7	2.8

Question # 56

Given the following initial conditions:

Power level = 80%
Coolant temperature = 561°F

After a load increase, steady-state conditions were as follows:

Power level = 100%
Coolant temperature = 565°F

Given the following, how much was boron change during the load increase with no change in rod height? (Disregard any fission product poison reactivity change.)

- Differential boron worth =6.61 pcm/ppm
- Power coefficient =14.65 pcm/%
- Boration =3.28 gal/ppm
- Dilution =42.4 gal/ppm
- Isothermal Temperature coefficient =5.21 pcm/°F
- Moderator temperature coefficient =3.79 pcm/°F

A 2027 gallon dilution

B 1879 gallon dilution

C 156 gallon dilution

D 148 gallon dilution

Answer: B

Explanation/Justification:

A Incorrect: Plausible because this is the answer the student would get if they included the moderator temperature coefficient change in their calculation

B Correct

C Incorrect: Plausible because this is the answer the student would get if they only calculated the change in coolant temperature

D Incorrect: Plausible because this is the answer the student would get if they used the Boration value in their calculation instead of the dilution value

Technical References: 2-POP-2.1
Proposed References to be provided: None

Learning Objective I2LP-ILO-POP007 2

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 1

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	002000A202 Ability to (a) predict the impacts of the following malfunctions or operations on the RCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of coolant pressure	
	Importance	4.2	4.4

Question # 57

Given the following:

- An RCS leak inside containment has occurred.
- RCS Pressure is 2100 psig and decreasing

In accordance with 2-AOP-LEAK-1 which ONE of the following situations would require the operator to trip the reactor and initiate safety injection?

A. Letdown flow is 75 GPM with one charging pump running at maximum speed and Pressurizer level is 25% and slowly lowering

B. Letdown flow is 45 GPM with two charging pumps running at maximum speed and Pressurizer level is 19% and stable

C. Letdown flow is 0 GPM with one charging pump running at maximum speed and Pressurizer level is 30% and stable

D. Letdown flow is 45 GPM with two charging pumps running at maximum speed and Pressurizer level is 32% and lowering slowly

Answer: D

Explanation/Justification:

A Incorrect: Plausible because PZR level is lowering

B Incorrect: Plausible because PZR level is 19% which is really close to the 14% setpoint to trip and SI

C Incorrect Plausible because letdown flow is 0 GPM

D Correct

Technical References: 2-AOP-LEAK-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPLEK 6

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#	2	
	Group#	2	
	K/A#	011000K601 Knowledge of the effect of a loss or malfunction of the following will have on the PZR LCS: - Reasons for starting charging pump while increasing letdown flow rate	
	Importance	2.8	3.2

Question # 58

Given the following:

- The plant is at 100% power with all systems in normal alignments.
- Pressurizer level is trending DOWN and VCT level is trending UP.
- RCS temperature and pressure are stable.
- 22 Charging Pump is running at maximum speed.

Which ONE (1) of the following describes the event in progress and action required?

A. Charging line leak outside containment. Isolate the leak in accordance with 2-AOP-LEAK-1, Sudden Increase In Reactor Coolant System Leakage

B. Pressurizer Level Transmitter has failed low. Select an alternate channel in accordance with 2-AOP-INST-1, Instrument or Controller Malfunctions

C. There was an increase in letdown flow. Start another charging pump in accordance with 2-SOP-3.1, Charging, Seal Water and Letdown Control.

D. Letdown line leak outside containment. Isolate the leak in accordance with 2-AOP-LEAK-1, Sudden Increase In Reactor Coolant System Leakage

Answer: C

Explanation/Justification:

A. Incorrect. VCT Level would not be trending up Plausible because PZR level is trending down.

B. Incorrect. Pressurizer level would be trending up for operable channel and VCT level would be trending down. Plausible because Charging pump is running at maximum speed.

C. Correct

D. Incorrect. VCT level would be trending down. Plausible because PZR level is trending down

Technical References: 2-SOP-3.1
Proposed References to be provided: None

Learning Objective I2LP-ILO-CS001 10c

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#	2	
	Group#	2	
	K/A#	014000K302 Knowledge of the effect that a loss or malfunction of the RPIS will have on the following: - Plant computer	
	Importance	2.5	2.8

Question # 59

The plant is operating at 75% power with Control Bank D at 180 steps withdrawn. An open circuit occurred in the IRPI coil stack (primary side) for Control Rod P-6.

Which of the following identifies the effects this malfunction will have on the available Rod Position Indications?

	Flight Panel DVM	IRPI Test Panel DVM	PICS Indication	Flight Panel IRPI
A.	Actual Rod Position	Actual Rod Position	Fully Withdrawn	Fully Withdrawn
B.	Fully Inserted	Fully Inserted	Fully Inserted	Fully Inserted
C.	Actual Rod Position	Actual Rod Position	Fully Inserted	Fully Inserted
D.	Fully Withdrawn	Fully Withdrawn	Fully Withdrawn	Fully Withdrawn

Answer: B

Explanation/Justification:

The candidate must know that an open circuit will result in 0 volts output from the Linear Voltage Differential Transformer (LVDT). The candidate must also recall that LVDT output is directly proportional to rod height i.e., increases as rod height increases. Finally the candidate must recall that the output from the LVDT supplies all components listed.

A. Incorrect. Plausible because candidate may believe that Actual Rod Position can always be determined using either the flight panel DVM or IRPI Test Panel DVM. In addition the PICS and Flight Panel indications are incorrect.

B. Correct

C. Incorrect. Plausible because candidate may believe that Actual Rod Position can always be determined using either the flight panel DVM or IRPI Test Panel DVM. In addition the PICS and Flight Panel indications are correct.

D. Incorrect. Plausible because the candidate may believe the LVDT output is inversely proportional to rod height.

Technical References:	2-GRAPH-RPC-3
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICRPI 4 I2LP-ILO-ICRPI 5

Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	015000K101 Knowledge of the physical connections and/or cause-effect relationships between the NIS and the following systems: - RPS	
	Importance	4.1	4.2

Question # 60

Which ONE of the following functions is provided when reactor power is raised above the P-10 setpoint?

A. Automatically blocks SR High Flux trip. Permits blocking of the PR High Flux (Low setpoint) trip

B. Automatically blocks IR High Flux trip and allows manual block of PR High flux (Low Setpoint) trips.

C. Allows manual block of SR High Flux trip, and IR High Flux trip and PR high flux (Low setpoint) trips

D. Allows manual block of IR and PR High flux (Low Setpoint) trips. Prevents re-energizing SR nuclear instrument channels.

Answer: D

Explanation/Justification:

A Incorrect. Plausible because it does permit blocking PR Hi Flux Low Setpoint; however it does not auto block SR High flux trip.

B. Incorrect. Plausible because P-10 does allow manual block of PR trips but IR range trips must also be manually blocked.

C. Incorrect. Plausible because P-10 does allow manual block of IR and PR trips but it does not auto block SR trip.

D. Correct.

Technical References:	Syst Desc 13
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICEXC 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#	2	
	Group#	2	
	K/A#	016000A301 Ability to monitor automatic operation of the NNIS, including: - Automatic selection of NNIS inputs to control systems	
	Importance	2.9	2.9

Question # 61

A slow leak has developed on the Main Boiler Feed Pump Suction pressure transmitter PT-408B causing indicated pressure to decrease.

Which of the following describes the impact of this condition on the Main Boiler Feed Pump Speed Control System?

The Main Boiler Feed Pump Speed Control System will:

A. Maintain current speed and go into Track and Hold due to the instrument failure.

B. Lower feed pump speed by selecting the lower of the %Feedwater signal and Low Suction Pressure cutback signal.

C. Lower feed pump speed due to the increase in differential pressure between suction and discharge pressure.

D. Lower feed pump speed due to the decreased speed control feedback signal to the regulation amplifier.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Track and Hold will maintain current speed for a very rapid decrease in %Feedwater Signal due to the failure (i.e., loss of control power) of the input controller

B. Correct. The Main Boiler Feed Pump speed control system selects the lower of %Feedwater signal and Suction Pressure signal to control pump speed.

C. Incorrect. Plausible because the Main Boiler Feed Pump Speed control system uses a differential pressure between DISCHARGE pressure and Steam Header Pressure to develop the %Feedwater Signal.

D. Incorrect. Plausible because the Main Boiler Feed Pump Speed control system uses actual pump speed to provide feedback input to the regulation amplifier.

Technical References: Syst Desc 21
Proposed References to be provided: None

Learning Objective
I2LP-ILO-ICLOVE 11
I2LP-ILO-ICLOVE 2
I2LP-ILO-ICLOVE 5
I2LP-ILO-ICLOVE 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#	2	
	K/A#	017000K403 Knowledge of ITM System design feature(s) and/or interlock(s) which provide for the following: - Range of temperature indication	
	Importance	3.1	3.3

Question # 62

A Loss of Coolant Accident has occurred; Control Room temperature has increased 15 deg-F above its normally maintained environment. As a result, the temperature in all instrument racks has risen by at least that amount. What impact will this change have upon the incore instrumentation information available to the operators?

A. CET readings will be falsely high by at least 15 deg-F and can be used for trending purposes up to 2300°F

B. CET readings will be falsely high by at least 15 deg-F and can be used for trending purposes up to 3300°F

C. No effect on CET readings as they are temperature compensated and can be used for trending purposes up to 2300°F

D. No effect on CET readings as they are temperature compensated and can be used for trending purposes up to 3300°F

Answer: C

Explanation/Justification:

A Incorrect: Plausible because 2300°F is correct.

B Incorrect: Plausible because 3300°F is close to 2300°F

C Correct

D Incorrect: Plausible because there is no effect on CET readings

Technical References:	Syst Desc 14
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICNXC 7
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	035000A401 Ability to manually operate and/or monitor in the control room: - Shift of S/G controls between manual and automatic control, by bumpless transfer	
	Importance	3.7	3.6

Question # 63

Given the following:

- The plant is approximately 20% power
- Power ascension is in progress

Which of the following describes the method used to transfer feedwater control to the Main Feedwater Regulating valves in accordance with SOP-21.1, Main Feedwater System?

A. Manually crack open the MFRV. When an increase in feedwater flow is observed, simultaneously close the associated LFBV while opening the MFRV. Place MFRV in auto when LFBV is closed and SG level is stable.

B. Manually crack open the MFRV. Ensure SG level is maintained on program by the automatic closure of the LFBV. When LFBV is closed and SG level is stable, place the MFRV in automatic.

C. Place the MFRV in automatic. Reduce SG level slightly by closing the LFBV and observe the MFRV automatically restores SG level to setpoint. Continue the process until LFBV is closed

D. Place the MFRV in auto. Raise controller output until SG level begins to rise. Manually throttle the LFBV closed, ensuring the MFRV automatically returns SG level to setpoint.

Answer: C

Explanation/Justification:

A Incorrect: Plausible because the MFRV and LFBV are operated and MFRV is eventually placed in AUTO

B Incorrect: Plausible because the MFRV and LFBV are operated and MFRV is eventually placed in AUTO

C Correct

D Incorrect: Plausible because MRFV is in AUTO

Technical References:	2-SOP-21.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MFW001 11
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 4

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

Given the following:

- The plant is in a refueling outage and fuel is being moved between the Fuel Building and the Vapor Containment
- Rad Waste personnel are conducting a general clean up of containment
- A high radiation alarm is received on R-2, Containment Area Monitor

What is the cause for the radiation alarm?

A. Fuel movement through the fuel transfer canal is increasing the general area radiation levels.

B. Additional irradiated fuel in the containment is increasing the general area radiation levels.

C. Staging of waste bags near the containment airlock is increasing the general area radiation levels.

D. Increased airborne activity as a result of containment clean up is increasing general area radiation levels.

Answer: C

Explanation/Justification:

A. Fuel movement will not place R-2 in alarm. R-2 is located on the 80 foot level near the containment airlock.

B. Refueling cavity level during refueling operation prevents the general area radiation level from increasing to the alarm point on R-2

C. Radioactive material staged near the containment airlock will be detected by R-2.

D. Increased airborne contamination could increase general area radiation levels; however, it would have been detected by the containment particulate monitor first.

Technical References:	2-ARP-SBF-2 3-ARP-005
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RMS001 5
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 11

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	075000K203 Knowledge of bus power supplies to the following: - Emergency/essential SWS pumps	
	Importance	2.6	2.7

Question # 65

Given the following:

- Unit 2 at 100%
- 24/25/26 Essential Service Water Header
- Three Header Service Water System Operation
- Operating Service Water Pumps prior to Rx Trip
  a. 21
  b. 22 powered from 2A
  c. 25 powered from 3A
  d. 26

From the list below, determine the service water pump combinations for 22 And 25 Service Water Pumps that would result following a Reactor Trip with a Station Blackout with no other equipment malfunctions:

SWP	22	25
A.	Running – 2A	Running -2A
B.	Stopped	Running -2A
C.	Running -2A	Running -3A
D.	Stopped	Running -3A

Answer: B

Explanation/Justification:

A Incorrect: Plausible because 25 SWP would be running on 2A

B Correct

C Incorrect: Plausible because 25 SWP would be running

D Incorrect: Plausible because 22 SWP would be stopped and 25 SWP would be running

Technical References:	2-AOP-138KV-1 2-AOP-480V-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-SW001 5

Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 4

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012103 Conduct of Operations - Knowledge of shift or short-term relief turnover practices.	
	Importance	3.7	3.9

Question # 66

EN-OP 115, "Conduct of Operations", states that every off-going operator will ________________."

A. brief all Control Room trainees, if present, prior to conducting watch relief

B. not leave their work area until they are satisfied that their relief has assumed the shift

C. ensure that the on-coming watchstander is properly signed in on the station log prior to leaving the Control Room

D. not relinquish the watch until satisfied that the on-coming Command and Control SRO has been fully briefed on the unit status

Answer: B

Explanation/Justification:

A Incorrect: Plausible because trainees in the Control Room will need to know current plant status and current plant evolutions in progress

B Correct

C Incorrect: Plausible because they want to ensure that the oncoming watch has the watch prior to leaving the control room.

D Incorrect: Plausible because CRS may have questions or need information from his crew prior to them leaving the control room

Technical References:	EN-OP-115
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ADM01 2
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#	1940012130 Conduct of Operations - Ability to locate and operate components, including local controls	
	Importance	4.4	4

Question # 67

Given the following:

- The Control Room has been evacuated 2-AOP-SSD-1 is in effect
- The reactor was tripped from the Control Room prior to evacuation.
- You have been dispatched as the second RO and are directed to maintain SG levels.
- 21 ABFP was tagged out for maintenance yesterday for bearing replacement.
- 22 and 23 ABFPs are operating.

Which of the following actions should you take to control feed to the SGs in accordance with AOP-SSD-1, Control Room Inaccessibility – Safe Shutdown Control?

A. Feed all four SGs to ensure even cooling of the RCS.

B. Feed 22 and 23 SGs to ensure steam is available to run 22 ABFP.

C. Feed 23 and 24 SGs using 23 ABFP to ensure a heat sink on the reactor.

D. Feed 21 and 22 SGs by using the control handjacks on FCV-405A/B (22 ABFP Discharge valve to 21 and 22 SGs)

Answer: D

Explanation/Justification:

A Incorrect: Plausible because student may believe feeding all four SG's will provide better cooling of the RCS

B Incorrect: Plausible because student may want to preferentially feed 22 or 23 SG to ensure there is sufficient volume to support running 22 ABFP

C Incorrect: Plausible because 23 ABFP feeds 23 and 24 SG

D Correct

Technical References: 2-AOP-SSD-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-ASSD 7

Question Source: Bank

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 4

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 # 68

The plant is in a refueling outage. A full core off-load is in progress and fuel is being removed from the core and sent to the Spent Fuel Pool (SFP), where insert shuffle is to take place.

The following conditions exist:

- The Refueling Manipulator in Containment has a Fuel Element fully withdrawn and is about to travel to the up-ender area.
- The SFP bridge have removed a fuel element from the up-ender and is proceeding from the transfer canal towards the spent fuel pool.
- A report from the Containment refueling team indicates that cavity level is decreasing rapidly and this has been confirmed by the team in the SFP.

Given that the operators implement the AOP for this event correctly, which of these answers contains a correct status for the fuel element in the Manipulator in the Containment, the fuel element on the bridge in the SFP and the fuel transfer tube gate valve?

	Fuel Element in the Containment Manipulator	Fuel Element on the SFP Bridge	Tube gate valve
A.	Place back into the reactor vessel	Placed in the upender in a down position	Closed
B.	Placed back into the reactor vessel	Placed in an accessible SFP storage rack	Closed
C.	Placed back into the reactor vessel	Placed in the upender in a down position	Open
D.	Stored vertically in the	Placed in an accessible	Open

Upender	SFP storage rack

Answer: B

Explanation/Justification:

A Incorrect: Plausible because the fuel element would be placed back in the reactor vessel

B Correct

C Incorrect: Plausible because the fuel element would be placed back in the reactor vessel

D Incorrect: Plausible because the fuel element on the SFP Bridge would be placed in an accessible SFP storage rack

Technical References: 2-AOP-FH-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-FHD001 11e

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#	1940012202 Equipment Control - Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	
	Importance	4.6	4.1

Question # 69

The following plant conditions exist during a reactor start-up with the MSIVs closed:

- RCS Boron is 1000 PPM.
- Estimated Critical Position is Bank D at 100 steps
- Doppler Power Coefficient is -12 pcm/%
- Moderator Temperature Coefficient is -5 pcm/°F
- Differential Rod Worth is 5 pcm/step

After recording critical data, the Reactor Operator pulls rods 10 steps to put the reactor on a 0.2 DPM startup rate. If no other operator action is taken to stabilize the plant at the POAH, the expected plant response will be:

A. T_{avg}, power level, and pressurizer level will all increase until the reactor trips at 10% power.

B. T_{avg}, power level, and pressurizer level will increase while the steam dumps open to stabilize the plant.

C. T_{avg}, power level, and pressurizer level will increase while the atmospherics open to stabilize the plant.

D. T_{avg} will increase which will add negative reactivity causing power to decrease, which will drive the reactor sub-critical.

Answer: C

Explanation/Justification:

Basis: When the reactor reaches the point of adding heat, the plant Tavg, pressurizer pressure and level increase. Doppler and moderator feedback will limit the power increase and the plant will stabile at a higher power level determined by the steam demand on the SG atmospherics.

Technical References: 2-POP-1.3
Proposed References to be provided: None

Learning Objective I2LP-ILO-POP006 3

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 1

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012239 Equipment Control - Knowledge of less than or equal to one hour technical specification action statements for systems.	
	Importance	3.9	4.5

Question # 70

During a plant shutdown with the unit at 6% reactor power, the following conditions existed before action was completed to stop the cooldown:

- Loop 21 Tavg - 540°F
- Loop 22 Tavg - 543°F
- Loop 23 Tavg - 542°F
- Loop 24 Tavg - 541°F

What Tech Spec actions for Minimim Temperature for Criticality?

A. No Tech Spec action is required since all loops Tavg's did not drop below 541°F.

B. Be in Mode 3 with Keff <1.0 within 30 minutes.

C. No Tech Spec action is required since the average of the four loop Tavg's remained at or above 541°F.

D. Be in Mode 2 with Keff < 1.0 within 30 minutes.

Answer: D

Explanation/Justification:

A Incorrect: Plausible because student may believe all Tavg need to drop below 541 in order for the tech spec to be applicable

B Incorrect: Plausible because the time is correct

C Incorrect: Plausible because the student may not know how to apply the tech spec

D Correct

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

Learning Objective I2LP-ILO-POP006 1

Question Source: Bank

Question History:

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012304 Radiological Controls - Knowledge of radiation exposure limits under normal and emergency conditions.	
	Importance	3.2	3.7

Question # 71

Which ONE of the following identifies the 10 CFR 20 annual limit for TEDE and also identifies the EP-115, Emergency Plan Forms, limit for saving valuable equipment?

A. 2 rem;
10 rem

B. 5 rem;
10 rem

C. 2 rem;
25 rem

D. 5 rem;
25 rem

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because 2 REM is the admin limit and 10 REM is correct for Emergency limits.

B. Correct. Both limits are correct.

C. Incorrect. Plausible because 2 REM is the admin limit and 25 Rem TEDE is listed in the EP but is applicable for search and rescue, first aid, and (as given in the stem) removal of injured personnel.

D. Incorrect. Plausibe because the first part is correct, however the second part is incorrect as noted in Distractor C.

Technical References: IPEC-EP
Proposed References to be provided: None

Learning Objective I0LP-ILO-ADM01 4

Question Source: Bank

Question History:

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#	1940002311 Radiological Controls - Ability to control radiation releases.	
	Importance	3.8	4.3

Question # 72

Given the following:

- Plant is operating at 100% power.
- Annunciator, R-46, FAN CLR UNIT SERVICE WTR HI RAD/TROUBLE, is in alarm.
- Increased activity from 22 FCU service water has been confirmed.

What action is required to be taken?

A. Isolate Service Water flow for 22 FCU and raise the R-46 High setpoint above existing reading to clear the alarm

B. Stop all FCUs and isolate Service Water flow to 22 FCU to prevent the spread of contamination in containment

C. Initiate Containment Ventilation Isolation to prevent an unmonitored release to the environment

D. Initiate a Containment Pressure Relief and monitor a release of the Containment environment to the plant vent

Answer: C

Explanation/Justification:

A Correct

B Incorrect: Plausible because service water flow is isolated to 22 FCU

C Incorrect: Plausible because we do not want an unmonitored release to the environment

D Incorrect: Plausible because student may want to see activity levels inside containment via the plant vent

Technical References: 2-ARP-SAF-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-RMS001 5

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#	3	
	Group#		
	K/A#	1940012315 Radiological Controls - Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	
	Importance	2.9	3.1

Question # 73

Given the following:

- A Waste Distillate Tank has been recirculated for 24 hours.
- Indications on R-54 Liquid Waste Distillate Monitor and confirmation sample shows that the water cannot be released due to the water radiation level.

Which of the following options is the most probable course of action the operators will take

A. The Waste Distillate tank will be recirculated till the radiation decays off.

B. The Waste Distillate tank will be transferred to the waste concentrates tank for further processing.

C. The Waste Distillate tank will be diluted.

D. The Waste Distillate tank will be transferred to a Waste Collection Tank for further processing.

Answer: D

Explanation/Justification:

A Incorrect: Plausible because given enough time the student may believe radiation levels will decrease

B Incorrect: Plausible because student may believe that waste will be transferred to a different tank for processing due to the current radiation levels

C Incorrect: Plausible because students may believe that dilution of the water will produce lower radiation levels

D Correct

Technical References: 2-SOP-5.1.3
Proposed References to be provided: None

Learning Objective I2LP-ILO-LWR001 11

Question Source: Bank

Question History:

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#	1940012445 Emergency Procedures/Plan - Ability to prioritize and interpret the significance of each annunciator or alarm.	
	Importance	4.1	4.3

Question # 74

The following alarms have just actuated:

- R-47 COMPONENT COOLING WATER HI RAD/TROUBLE
- COMPONENT COOLING SURGE TANK LEVEL
- THERMAL BARRIER CCW HEADER LOW FLOW

What ONE (1) of the following procedures will be used to respond to this event?

A. AOP-RCP-1, Reactor Coolant Pump Malfunction

B. AOP-LEAK-1, Excessive Reactor Coolant System Leakage

C. AOP-CCW-1, Loss of Component Cooling

D. AOP-LICCW-1, Leakage into the Component Cooling System

Answer: D

Explanation/Justification:

A Incorrect: Plausible because of the Thermal Barrier CCW header low flow alarm

B Incorrect: Plausible because of the high rad alarm

C Incorrect: Plausible because of the component cooling surge tank level alarm

D Correct

Technical References:	2-AOP-LICCW-1 3-AOP-LICCW-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-AOPLIC 1
Question Source:	Bank
Question History:	
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#	1940012450 Emergency Procedures/Plan - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	
	Importance	4.2	4

Question # 75

Which ONE of the following describes the parameter, setpoint, and actuation upon receiving the annunciator ABFP LOW SUCT PRESSURE?

A. 0 psig on the combined AFW suction header from the CST; City Water is manually aligned to supply the TDAFW and the MDAFW Pumps.

B. 0 psig on the combined AFW suction header from the CST; City Water is automatically aligned to supply the 21 MDAFW Pump; City Water is manually aligned to supply the TDAFW and 23 MDEFW Pumps.

C. 4 psig on the combined AFW suction header from the CST; City Water is manually aligned to supply the TDAFW and the MDAFW Pumps.

D. 4 psig on the combined AFW suction header from the CST; City Water is automatically aligned to supply the 21 MDAFW Pump; City Water is manually aligned to supply the TDAFW and 23 MDAFW Pumps.

Answer: C

Explanation/Justification:

A Incorrect: Plausible because city water is manually aligned to supply the pumps

B Incorrect: Plausible because city water is aligned to the pumps

C Correct

D Incorrect: Plausible because 4 psig is correct

Technical References:	2-ARP-SCF
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MFW001 13p

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#	000022A202 Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: - Charging pump problems	
	Importance	3.2	3.7

Question # 76

Given the following:

- Unit 2 is operating at 100% power.
- 22 charging pump is operating with flow cycling between 25 and 70 gpm.
- Seal injection flows fluctuating between 3 and 6 gpm.
- Letdown is 87 gpm.
- VCT level is 23% with LCV112C open.
- VCT Outlet Temperature is 115° F

Then:

- The Reactor Operator reports 22 charging pump has tripped.
- As the SRO, you direct entry into 2-AOP-CVCS-1.

Which of the choices below correctly describes both:

(1) what has occurred and the most urgent operational concern
and
(2) the required actions per 2-AOP-CVCS-1?

A. (1) Gas binding of the charging pumps has occurred and common mode failure of the remaining charging pumps is possible.
(2) Isolate letdown, isolate charging, Isolate seal injection locally, correct the cause of gas binding, perform initial start of charging pump per SOP, slowly re-establish seal injection, re-establish charging and letdown per AOP Attachment.

B. (1) Cavitation of the charging pumps has occurred and common mode failure of the remaining charging pumps is possible.
(2) Isolate charging and VCT outlet, align charging pump suction to the RWST, start standby a pump.

C. (1) Gas binding of the charging pumps has NOT occurred and the most urgent concern is that RCP seal injection has been lost.
(2) Start a standby charging pump, adjust seal flow to normal and then restore charging and letdown to normal per AOP attachment.

D. (1) Cavitation of the charging pumps has NOT occurred and the most urgent concern is that RCP seal injection has been lost.
(2) Isolate letdown, isolate charging, Isolate seal injection locally, align charging to RWST, start a standby charging pump, re-establish charging and letdown and slowly re-establish seal injection per AOP attachment.

Answer: A

Explanation/Justification:

A. Correct. Oscillating flows indicates gas binding. Since all charging pumps have a common suction the condition likely effects all charging pumps. The charging pump is started per the SOP to vent the suction.

B. Incorrect. Plausible because the charging pump has experienced gas binding. Candidate may believe that aligning the charging pump to the RWST will provide a source of cool water that will allow starting the pump.

C. Incorrect. Plausible because this was the correct answer for the unmodified question; the candidate must recognize the indications of vapor binding. Also it is not necessary to start the pump per the SOP if gas binding was NOT the cause.

D. Incorrect. Plausible because the candidate must recognize the indications of vapor binding. The actions are similar to those required for the trip of a charging pump; however, the suction is NOT aligned to the RWST and seal injection is NOT isolated if gas binding is NOT the concern

Technical References: 2-AOP-CVCS-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPCVC 3

Question Source: Modified

Question History: Unit 2 NRC 2008

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#	1940012441 Emergency Procedures/Plan - Knowledge of the emergency action level thresholds and classifications.	
	Importance	2.9	4.6

Question # 77

The plant was initially at 100% power.

TIME	EVENT
0300	Based on RCS and SG indications, the operating crew determined that a Steam Generator Tube Rupture occurred on 23 SG. The Leakrate was estimated at approximately 125 gpm.
0305	Manual Reactor Trip and Safety Injection.
0310	Shift Manager Declared initial event
0315	NPO reports that a safety valve on 23 SG has lifted and has not reseated.

Which of the following describes the Emergency Classification and the latest time that the NRC must be notified?

A. Alert 0410

B. Alert 0415

C. SAE 0410

D. SAE 0415

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the SGTR alone is an ALERT. The SGTR in combination with the faulted SG is an SAE. Time is also incorrect, one hour from event not one hour from classification.

B. Incorrect. Plausible because the SGTR alone is an ALERT. The SGTR in combination with the faulted SG is an SAE. Time is correct.

C. Correct.

D. Incorrect. Classification is correct. Time is incorrect, one hour from event not one hour from classification.

Technical References:	IP-EP-120
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ERT002 4
Question Source:	Modified
Question History:	Ginna NRC 2007
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#	1940012143 Conduct of Operations - Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.	
	Importance	4.1	4.3

Question # 78

Given the following:

- The reactor has tripped from 100% near BOL.
- A loss of offsite power subsequently occurs.
- Control rod drive fans are **not** running
- The operating crew has transitioned to ES- 0.2, "Natural Circulation Cooldown."
- The pressurizer and RCS are sampled for boron
- Hot Shutdown boron concentration is met
- Cold shutdown boron concentration is **not** met

Which of the following is correct concerning reactor plant cooldown?

A. Boron concentration is adequate, the cooldown can commence at 25°F/hr.

B. Boron concentration is adequate, the cooldown can commence at <100°F/hr.

C. Boron concentration is **not** adequate, additional boration is required before the cooldown can begin.

D. Boron concentration is **not** adequate, cooldown can commence at 25°F/hr after boration is initiated.

Answer: C

Explanation/Justification:

Point beach 2009
A. Incorrect. Plausible because the candidate may believe that Hot Shutdown boron concentration is adequate to initiate cooldown at 25°F (the cooldown rate in ES-0.2)

B. Incorrect. Plausible because the candidate may believe that Hot Shutdown boron concentration is adequate to initiate cooldown at <100°F (the cooldown rate allowed in ES-0.3)

C. Correct. Cooldown cannot commence until cold shutdown boron is established.

D. Incorrect. Candidate may believe that cooldown can commence if boration to cold shutdown is established.

Technical References:	2-ES-0.2 3-ES-0.2
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPS02 1
Question Source:	Bank
Question History:	Point Beach NRC 2009
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#	0000652107 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 # 79

Given the following:

- The Unit is at 43%
- INST AIR LOW PRES alarm has actuated
- Instrument air pressure is 75 psig and decreasing slowly
- Instrument air compressor control switches are in AUTO
- Pressurizer level is 53% and increasing slowly
- LCV-459, has failed closed
- Steam Generator Narrow Range levels are 35% and decreasing slowly
- VCT level is 20% and decreasing slowly

Which ONE of the following is the required action for this event?

A. Take manual control of Charging Pump speed and reduce speed.

B. Trip the reactor and initiate E-0, Reactor Trip or Safety Injection.

C. Commence an immediate plant shutdown per POP 3.1. Plant Shutdown from 45% Power.

D. Take manual control of Main Boiler Feed Pump speed and increase speed.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Charging pump speed is failing high, lowing pump speed would assist in maintaining pressurizer level however this will not be affective.

B. Correct. SG levels have decreased by > 10% requiring a reactor trip and initiating E-0.

C. Incorrect. Plausible because this action is performed if letdown cannot be re-established or if PRZR level is < 5% and Rx power is 0%.

D. Incorrect. Plausible because increasing speed would assist in maintaining Steam Generator levels however FRVs will continue to fail closed.

Why are SG Levels above program (>45%)?

Technical References:	2-AOP-AIR-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-SA01 12 I2LP-ILO-SA01 15
Question Source:	Modified
Question History:	NA
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#	00WE11A202 Ability to determine and interpret the following as they apply to the Loss of Emergency Coolant Recirculation: - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
	Importance	3.4	4.2

Question # 80

Given the following conditions:

- 21 Recirc Pump is OOS for breaker maintenance.
- A LOCA has occurred.
- While performing E-1, "LOSS OF REACTOR OR SECONDARY COOLANT", 21 RHR pump motor seizes.
- Bus 6A normal feeder breaker trips on Overcurrent.
- The crew enters ECA-1.1, LOSS OF EMERGENCY RECIRCULATION.
- RWST Level is 30'
- A cooldown has been initiated as directed in ECA-1.1.
- During the cooldown, the crew restores power to bus 6A.

Based on current plant conditions, which of the following describes an appropriate mitigation strategy?

A. Start 22 RHR pump and return to E-1 and continue recovery actions with the step previously in effect.

B. Start 22 RHR pump and continue actions of ECA-1.1 until the RWST LOW LOW Level alarm actuates.

C. Continue with the cooldown and start 22 RHR pump when directed in ECA-1.1.

D. Start 22 Recirc pump and transition to ES-1.3, "TRANSFER TO COLD LEG RECIRCULATION", to verify recirculation flowpath.

Answer: A

Explanation/Justification:

A Correct

B Incorrect, Plausible because power is restored to 22 RHR pump and student may believe the correct action is to now start the pump and stay in ECA-1.1

C Incorrect, Plausible because with power restored student may stay in the procedure and wait to start 22 RHR pump when directed by the procedure

D Incorrect, Plausible because with power restored to bus 6A student may want to start 22 Recirc pump and transition to ES-1.3 to verify the recirculation flowpath

Technical References:	2-ECA-1.1 3-ECA-1.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPC11 5

Question Source:	Bank
Question History:	
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#	00WE12A201 Ability to determine and interpret the following as they apply to the Uncontrolled Depressurization of all Steam Generators: - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	
	Importance	3.2	4

Question # 81

Given the following:

- The unit was operating at 100% power
- An earthquake caused a rupture in the East Main Steam Header
- Main Steam Isolation Valves (MSIV) would not close
- Nuclear Plant Operators are currently trying to close any MSIV
- The Control Room team has entered ECA-2.1, "Uncontrolled Depressurization of all Steam Generators"
- An NPO reports that the 22 Steam Generator MSIV has been closed

What of the following describes conditions necessary to transition out of ECA-2.1 and what procedure should be entered?

A. SI Termination in ECA-2.1 is complete
Transition to E-1 Loss of Reactor or Secondary Coolant

B. At least one SG pressure is increasing
Transition to E-2, Faulted SG Isolation

C. RCS pressure is > 320 psig and stable
Transition to E-2, Faulted SG Isolation

D. SR NIS Startup Rate = 0.1 dpm
Transition to FR-S.2 Response to Loss of Core Shutdown

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because If SI termination is initiated in ECA-2.1, a transition is NOT made until it is complete; however, the transition from ECA-2.1 requires SG pressure increasing and it directs the operating team to E-2.

B. Correct. From the ECA-2.1 Foldout Page, If any SG pressure increases at any time, except while performing SI Termination in Steps 10 to 18, to 2-E-2.

C. Incorrect. Plausible because a transition to E-1 is made if RCS pressure is LESS THAN 320 psig and stable or increasing.

D. Incorrect. Plausible because a SUR of 0.1 dpm is entry condition for FR-S.2; however, FR-S.2 is a "yellow" path procedure and it is not required to be entered.

Technical References:	2-ECA-2.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPC21 1
Question Source:	New
Question History:	NA
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#	000003A201 Ability to determine and interpret the following as they apply to the Dropped Control Rod: - Rod position indication to actual rod position	
	Importance	3.7	3.9

Question # 82

Given the following:

- The operating crew is performing 2-POP-1.3, Plant Startup from Zero to 45% Power.
- Power level is 25%
- Control Bank D is at 149 steps
- Tavg is 552° F

- The Rod Bottom Light for H-8 illuminates
- IRPI for H-8 indicates 0 inches
- The Rod Bottom Rod Stop alarm annunciates
- NIS Power Range Dropped Rod Rod Stop alarm did NOT annunciate
- Reactor Power is approximately 23% on all 4 Power Range NIs
- Tavg decreased to 548°F

Which ONE (1) of the following describes the current condition of rod H-8 and the actions required (if any) in accordance with Technical Specifications?

A. H-8 IRPI has failed low; Verify the position of H-8 Once per 12 hours

B. H-8 IRPI has failed low; No additional actions needed, Power is < 50%

C. H-8 is dropped; Verify SDM within limits of COLR within 1 hour and MODE 3 within 6

D. H-8 is dropped; Restore alignment within 1 hour OR verify SDM within limits of COLR within 1 hour.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because most actual dropped rod conditions actuate the NIS Power Range Dropped Rod Rod Stop alarm. At this power level the alarm did not actuate. The candidate must identify the actual dropped rod from Tavg decrease. The TS action is correct for a failed IRPI if power is greater than 50%.

B. Incorrect. Plausible because most actual dropped rod conditions actuate the NIS Power Range Dropped Rod Rod Stop alarm. At this power level the alarm did not actuate. The candidate must identify the actual dropped rod from Tavg decrease. The TS action is correct for a failed IRPI if power is less than 50%.

C. Incorrect. Plausible because the rod is dropped; the TS action is for an inoperable control rod not a misaligned rod.

D. Correct. The rod is dropped and the TS action is correct.

Technical References:	2-AOP-ROD-1 Tech Specs
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICRPI 14

Question Source:	New
Question History:	NA
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#	000024A204 Ability to determine and interpret the following as they apply to the Emergency Boration: - Availability of BWST	
	Importance	3.4	4.2

Question # 83

Given the following:

- The plant was operating at 100% power
- 22 Boric Acid Transfer Pump is in service
- 21 Boric Acid Transfer Pump is out of service for maintenance
- 22 Primary Water Pump is in service
- 22 Charging Pump is in service
- 21 Rod Drive MG set is secured for maintenance
- Bus 6A normal feed breaker tripped on a fault resulting in a reactor trip
- 3 control rods failed to insert on the trip

The operating crew performed E-0, Reactor trip or Safety Injection steps 1-4 and transitioned to ES-0.1, Reactor Trip Response. At step 6 the CRS determines Emergency Boration is required. All actions of E-0 and ES-0.1 up to step 6 have been completed.

In accordance with 2-SOP-3.2, Reactor Coolant System Boron Concentration Control, which of the following describes the emergency boration flowpath for current plant conditions?

A. Normal Boration Path

B. MOV-333 Boration Path

C. CH-293, Boric Acid Blender Bypass, Alternate Method

D RWST Boration Path via LCV-112B

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because this is the preferred method of Emergency Boration per 2-SOP-3.2; however, due to loss of bus 6A, 22 boric acid transfer pump is not operating and 21 Boric Acid Transfer Pump is out of service.

B. Incorrect. Plausible because MOV-333 is the Emergency Boration Valve; however, this path is not available due to loss of bus 6A, 22 boric acid transfer pump is not operating. Candidate must remember that the inservice Boric Acid Transfer Pump supplies MOV-333.

C. Incorrect. Plausible because , this path is not available due to loss of bus 6A, 22 boric acid transfer pump is not operating. Candidate must remember that the inservice Boric Acid Transfer Pump supplies CH-293.

D. Correct. RWST is the first alternate boration path and the only path available with the inservice boric acid transfer pump secured.

Technical References: 2-SOP-3.2
Proposed References to be provided: None

Learning Objective I2LP-ILO-CVCS 5

Question Source: New

Question History: NA

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#	1940012408 Emergency Procedures/Plan - Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	
	Importance	3.8	4.5

Question # 84

Given the following:

- The plant was operating at 100% power.
- N-16 Radiation Monitor for 22 SG alarms
- NPO reports N-16 indicates 150 GPD leak
- Chemistry confirms the leakrate at approximately 150 GPD
- The operating crew entered 2-AOP-SG-1, Steam Generator Tube Leak
- During the performance of 2-AOP-RSD-1, Rapid Shutdown, the plant was tripped at 250 MWe.

Assuming no further degradation in SG tube integrity and all equipment functions as designed, which of the following describes the expected procedure flowpath for this event?

A. Perform E-0, Reactor Trip or Safety Injection, and manually initiate Safety Injection
Transition to E-3, Steam Generator Tube Rupture
Transition to ES-3.1, Post SGTR Cooldown Using Backfill

B. Perform E-0, Reactor Trip or Safety Injection, and manually initiate Safety Injection
Transition to E-3, Steam Generator Tube Rupture
Transition to ES-3.2, Post SGTR Cooldown Using Blowdown

C. Perform E-0, Reactor Trip or Safety Injection,
Transition to ES-0.1, Reactor Trip Response
Perform actions in 2-AOP-SG-1 in parallel with ES-0.1
Perform plant cooldown using 2-POP-3.3, Plant Cooldown

D. Perform E-0, Reactor Trip or Safety Injection,
Transition to ES-0.1, Reactor Trip Response

When ES-0.1 is complete return to 2-AOP-SG-1
Perform plant cooldown using 2-AOP-SG-1.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because candidate may believe that once the EOP network is entered, E-3 is the best option. A SG tube leak of this size will not require a safety injection. In addition, a cooldown using backfill would be nearly impossible for a small break.

B. Incorrect. Plausible because candidate may believe that once the EOP network is entered, E-3 is the best option. A SG tube leak of this size will not require a safety injection. In addition, a cooldown using blowdown would be preferable to backfill for a small break.

C. Correct. Since conditions do not exist for a safety injection, a transition to ES-0.1 is correct. Actions in 2-AOP-SG-1 should be performed in parallel to minimize contamination.

D. Incorrect. Plausible because conditions will not exist for a safety injection. A transition to ES-0.1 is correct. However, actions in 2-AOP-SG-1 to minimize the spread of contamination should not wait until ES-0.1 is complete. In addition, 2-AOP-SG-1 does not have cooldown steps.

Technical References: 2-AOP-SG-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPSG1 2

Question Source: New

Question History: NA

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#	00WE092406 Emergency Procedures/Plan - Knowledge of EOP mitigation strategies.	
	Importance	3.7	4.7

Question # 85

Given the following:

- A natural circulation RCS cooldown is in progress
- RCS hot leg temperatures are at 535°F
- RCS pressure is at 1880 psig and Automatic SI has been blocked
- The crew initiated ES-0.2 Natural Circulation Cooldown and is at step 6
- Subsequently, RVLIS becomes unavailable

Which of the following describes correct actions at this time and the difference in the mitigation strategies between ES-0.2 Natural Circulation Cooldown and ES-0.4, Natural Circulation Cooldown with Steam Void in Vessel (Without RVLIS)?

A. Complete first 11 steps of ES-0.2 then transition to ES-0.4
- Cooldown Rate is increased from 25°F/hr in ES-0.2 to 50°F/hr in ES-0.4
- Both procedures direct simultaneous cooldown and depressurization
- ES-0.4 does NOT include a "soak" period prior to depressurizing the RCS.

B. Immediately transition to ES-0.4
- Cooldown Rate is increased from 25°F/hr in ES-0.2 to 100°F/hr in ES-0.4
- Both procedures direct simultaneous cooldown and depressurization
- ES-0.4 does NOT include a "soak" period prior to depressurizing the RCS.

C. Complete first 11 steps of ES-0.2 then transition to ES-0.4
- Cooldown Rate is increased from 25°F/hr in ES-0.2 to 50°F/hr in ES-0.4
- ES-.02 direct simultaneous cooldown and depressurization: ES-0.4 directs a stepwise cooldown and depressurization

- Both procedures include a “soak” period prior to depressurizing the RCS.

D. Immediately transition to ES-0.4
- Cooldown Rate is increased from 25°F/hr in ES-0.2 to 100°F/hr in ES-0.4
- ES-.02 direct simultaneous cooldown and depressurization: ES-0.4 directs a stepwise cooldown and depressurization
- Both procedures include a “soak” period prior to depressurizing the RCS.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the allowable cooldown rate increases in ES-0.4; however it increases to 100°F/hr. ES-0.2 and ES-0.3 direct simultaneous cooldown and depressurizations, ES-0.4 directs a stepwise cooldown and depressurization. All natural circ procedures include a 27 hour soak period prior to final depressurization.

B. Incorrect. Plausible because the allowable cooldown rate increases in ES-0.3 is 100°F/hr; however, the cooldown rate in ES-0.4 is 50°F/hr. ES-0.2 and ES-0.3 direct simultaneous cooldown and depressurizations, ES-0.4 directs a stepwise cooldown and depressurization. All natural circ procedures include a 27 hour soak period prior to final depressurization.

C. Correct.

D. Incorrect. Plausible because the allowable cooldown rate increases in ES-0.3 is 100°F/hr; however, the cooldown rate in ES-0.4 is 50°F/hr. ES-0.4 directs a stepwise cooldown and depressurization. All natural circ procedures include a 27 hour soak period prior to final depressurization.

Technical References:	2-ES-0.2 2-ES-0.2 BG 3-ES-0.2 3-ES-0.4
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPS02 3 I2LP-ILO-EOPS04 3

Question Source:	Modified
Question History:	NA
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#	0050002236 Equipment Control - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	
	Importance	3.1	4.2

Question # 86

Given the following:

The plant is in Mode 6 with the refueling cavity at 93'.
Core off-load is in progress
21 RHR pump is in service
23 EDG is tagged out for maintenance.

During the maintenance activities on 23 EDG, it was discovered that a replacement part was not qualified for the job. In addition, the same non-qualified part was previously installed on 21 EDG during this outage.

Which of the following states the most restrictive LCO for this condition and what actions are required?

A. Declare 21 and 23 Safety Injection Pumps inoperable and restore one to operable status within 1 hour.

B. Declare Safety Injection pump inoperable and initiate actions to restore to operable status within 24 hours.

C. Declare 21 EDG inoperable, CORE ALTERATIONS may continue for up to 1 hour.

D. Declare 21 EDG inoperable, suspend all CORE ALTERATIONS immediately.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because 21 and 23 SI pumps are inoperable; however, the pumps are not required for MODE 6 with the head removed.

B. Incorrect. Plausible because 21 SI Pump should be declared inoperable; however, the pumps are not required for Mode 6 with the head removed.

C. Incorrect. Plausible because 21 EDG is declared inoperable but core alterations must be suspended immediately.

D. Correct.

Technical References:	Tech Specs
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EDS01 14
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	0100002222 Equipment Control - Knowledge of limiting conditions for operations and safety limits.	
	Importance	4	4.7

Question # 87

A plant trip has occurred 15 minutes ago. Which ONE of the following states the RCS Pressure Safety limit setpoint, the MAXIMUM time allowed in accordance with Technical Specifications to reduce RCS pressure below the safety limit and the time limit within which the NRC must be notified?

	Pressure Limit	**Restoration Time**	**NRC Notification Time**
A.	2735 psig	5 Minutes	1 hour
B.	2735 psig	1 Hour	1 hour
C.	2700 psig	5 Minutes	4 hours
D.	2700 psig	1 Hour	4 hour

Answer: A

Explanation/Justification:

A. Correct

B. Incorrect. Plausible because the pressure limit is correct but restoration time is not correct.

C. Incorrect. Plausible because the pressure value is close, the restoration time is correct but the NRC notification time is wrong.

D. Incorrect. Plausible because the pressure value is close, the restoration time is correct for MODE 1the NRC report time is incorrect

Technical References:	Tech Specs
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RCSPZR 14
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	012000A201 Ability to (a) predict the impacts of the following malfunctions or operations on the RPS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Faulty bistable operation	
	Importance	3.1	3.6

Question # 88

Given the following:

- I&C is performing a surveillance test on Pressurizer High Pressure Reactor Trip.
- The technician reports that the High Pressure Reactor Trip bistable for Channel 455 is stuck at 2465 psig and cannot be adjusted to the correct value.
- The bistable will need to be replaced.
- The new bistable will not be onsite for 5 days.

Tech Spec Table 3.3.1-1 for Pressurizer Pressure

7. Pressurizer Pressure					
a. Low	1(e)	4	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 1878 psig
b. High	1,2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 2416 psig

Which of the following identifies the immediate impact on the Reactor Protection System and what actions (if any) are required.

A. The current setpoint is non conservative
The channel for PT-455 MUST be removed from service using 2-AOP-INST-1, Instrument or Controller Failures.

B. The current setpoint is conservative

Only the bistable MUST be placed in the tripped condition in accordance with Tech Specs

C. The current setpoint is non conservative
Only the bistable MUST be placed in the tripped condition in accordance with Tech Specs

D. The current setpoint is conservative
The channel for PT-455 MUST be removed from service using 2-AOP-INST-1, Instrument or Controller Failures

Answer: C

Explanation/Justification:

Give Candidate Table 3.3.1-1 Reactor Protection System Instrumentation.
A. Incorrect. Plausible because the setpoint is non-conservative (allowable value is 2416 in TS); however, the AOP is not the correct procedure to use for these conditions.

B. Incorrect. Plausible because the TS allowable value is greater than the actual setpoint used in the bistable; the candidate may believe that this value is acceptable. The bistable must be placed in the tripped condition to satisfy TS. It is not necessary to remove the entire channel.

C. Correct. Plausible because the setpoint is non-conservative (allowable value is 2416 in TS). The AOP is not appropriate for this condition and only the faulty bistable needs to be placed in the tripped condition.

D. Incorrect. Plausible because the TS allowable value is greater than the actual setpoint used in the bistable; the candidate may believe that this value is acceptable. The AOP is not the correct procedure to use for these conditions.

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

Learning Objective I0LP-ILO-ITS001 3

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	006000A208 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Effect of electric power loss on valve position	
	Importance	3	3.3

Question # 89

Given the following:

- The plant was operating at 100% power.
- A loss of both Main Boiler feed pumps resulted in a reactor trip.
- When the reactor tripped bus 6A tripped on over current.
- 22 EDG failed to start.
- 22 Auxiliary Boiler Feed Pump tripped on Overspeed.
- The crew has just transitioned to 2-FR-H.1
- Steam Generator Wide Range Levels are:
  - 21 – 47%
  - 22 – 38%
  - 23 – 37%
  - 24 – 45%

Which of the following describes the actions in FR-H.1 for these conditions?

A. When the average of ALL SG levels decrease to ≤ 41% initiate safety injection
Start available charging pumps
Open both PORV Block Valves
Open both PORVs

B. Secure ALL RCPs
Initiate Safety Injection
Start available charging pumps
Open one PORV Block Valve

Open one PORV
Re-energize and Open all available Head Vent Valves

C. When the average of ALL SG levels decrease to ≤ 41% initiate safety injection
Secure 21,22, and 23 RCPs
Start available charging pumps
Open one PORV Block Valve
Open one PORV
Re-energize and Open all available Head Vent Valves

D. Initiate Safety Injection
Start available charging pumps
Open both PORV Block Valves
Open both PORVs

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Feed and Bleed criterion is the average of the 3 lowest NOT the average of all SG WR levels. The PORV block valves are normally closed and, the block valve for one of the PORVs is powered from bus 6A (MCC26B). Opening the PORV will not satisfy the requirement if the Block valve is closed.

B. Correct. Only one PORV Block valve is energized and capable of being opened. The head vent valves must be re-energized and opened.

C. Incorrect. Plausible because Feed and Bleed criterion is the average of the 3 lowest NOT the average of all SG WR levels. The block valve for one of the PORVs is normally closed and powered from bus 6A (MCC26B). Thus only one PORV can be opened as a vent path. The head vent valves must be re-energized and opened.

D. Incorrect. Plausible because Feed and Bleed criterion is satisfied; however the PORV block valves are normally closed and, the block valve for one of the PORVs is powered from bus 6A (MCC26B). Opening the PORV will not satisfy the requirement if the Block valve is closed.

Technical References: 2-FR-H.1
Proposed References to be provided: None

Learning Objective	I2LP-ILO-EOPFH1 5
Question Source:	New
Question History:	NA
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#	013000A205 Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of dc control power	
	Importance	3.7	4.2

Question # 90

The SAFEGUARDS RELAYS DC POWER FAILURE alarm comes in. Investigation reveals that the DC Power Supply to the Train A Safeguards Rack has failed. No other alarms are up.

Which of the following statements accurately describes the status of the Safeguards Initiation System to this event and what actions are required?

A. SI Train A is disabled due to loss of power to the master relays. If SI is required, Train A equipment will start. Some Phase A valves will have to be manually aligned using E-0, Reactor Trip or Safety Injection Attachment 1

B. SI Train A is disabled due to loss of power to the master relays. If SI is required, Train A equipment cannot be started due to a loss of control power. Some Phase A valves will be properly aligned

C. Automatic SI Train A is disabled due to loss of power to the master relays. If SI is required, Train A equipment will have to be manually started/realigned using E-0, Reactor Trip or Safety Injection Attachment 1.

D. Automatic SI Train A is disabled due to loss of power to the master relay. If SI is required, Manual actuation of SI Train A is available and will actuate all safeguards equipment.

Answer: A

Explanation/Justification:

A. Correct. Either Train A or Train B SI actuation will start all of the Safeguards Pumps. The Phase A signal is train specific and either train actuates ½ of the valves. The remaining valves will be shut manually using E-0 Attachment 1.

B. Incorrect. Plausible because the Train A Auto and Manual relays will not actuate SI equipment. The loss of control power to the SI actuation relays does not prevent manually starting (loss of control power) to the individual SI equipment. The Phase A signal is train specific and either train actuates ½ of the valves. The remaining valves will be shut manually using E-0 Attachment 1.

C. Incorrect. Plausible because Automatic SI is disabled; however, Train B SI will start all equipment and actuate Train B Phase A. Train B Phase A will close ½ of the valves.

D. Incorrect IPEC Unit 2 has independent Automatic and Manual SI actuation Master Relays. Both Master relays are powered from the same source; however, the candidate may believe the power sources are independent to provide increased reliablility.

Technical References:	2-ARP-SBF-1 2-SOP-10.1.4
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ESS001 7
Question Source:	Modified
Question History:	Unit 3 NRC 2010
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#	017000A202 Ability to (a) predict the impacts of the following malfunctions or operations on the ITM System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Core damage	
	Importance	3.6	4.1

Question # 91

A severe accident has occurred and the operating team is currently implementing the Emergency Operating Procedures. The following conditions exist:

- All RCPs are off.
- PZR level is off scale low.
- RVLIS, Natural Circ Range, is 52%
- RCS pressure is 400 psig.
- Core exit thermocouples are reading 750°F.

What course of action should the operating team take?

A. Transition to FR-C.1, Response to Inadequate Core Cooling because core damage is occurring.

B. Transition to FR-C.1, Response to Inadequate Core Cooling because core uncovery is occurring and core damage is imminent.

C. Transition to FR-C.2, Response to Degraded Core Cooling because core damage is likely occurring.

D. Transition to FR-C.2, Response to Degraded Core Cooling because core uncovery is occurring.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because IP-EP-360 Core Damage Assessment (E-Plan Procedure) uses 700°F as one criterion when evaluating if core damage has occurred. The purpose of FR-C.1 is to prevent Core Damage due to inadequate core cooling condition.

B. Incorrect. Plausible because IP-EP-360 Core Damage Assessment (E-Plan Procedure) uses 700°F as one criterion when evaluating if core damage has occurred. The purpose of FR-C.1 is to prevent Core Damage due to inadequate core cooling condition..

C. Incorrect. Plausible because IP-EP-360 Core Damage Assessment (E-Plan Procedure) uses 700°F as one criterion when evaluating if core damage has occurred. The purpose of FR-C.2 is to restore core cooling before an inadequate core cooling condition that would lead to core damage.

D. Correct. FR-C.2 addresses conditions where core uncovery is likely. The actions in FR-C.2 address restoration of inventory to prevent on inadequate core cooling condition.

Technical References: 2-FR-C.1
2-FR-C.1 BG

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFC1 5

Question Source: New

Question History: Unit 2 NRC 2004

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#	033000A201 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: - Inadequate SDM	
	Importance	3	3.5

Question # 92

Given the following:

- Core offload is complete.
- All core alterations have stopped.
- The Spent Fuel pool is isolated from the Transfer Canal.
- The Spent Fuel pool level is 93'
- Chemistry reports new and backup samples are less than 700 ppm Boron concentration in the Spent Fuel Pool

Which of the following will satisfy Technical Specifications?

A. Increase Spent Fuel pool Boron concentration to > 2000 ppm to satisfy Shutdown Margin.
Use 2-SOP-4.3.1, Spent Fuel Pit Cooling, to dump boron into the pool and recirculate water with the Spent Fuel Pit Cooling Pump.

B. Increase Spent Fuel pool Boron concentration to > 2000 ppm to satisfy Shutdown Margin.
Use 2-SOP-3.2 Reactor Coolant System Boron Concentration Control, to raise the boron concentration in the pool and recirculate water with the Spent Fuel Pit Cooling Pump.

C. Increase Spent Fuel pool Boron concentration to > 786 ppm to satisfy Shutdown Margin.

Use 2-SOP-3.2 Reactor Coolant System Boron Concentration Control, to raise the boron concentration in the pool and recirculate water with the Spent Fuel Pit Cooling Pump.

D. Increase Spent Fuel pool Boron concentration to > 786 ppm to satisfy Shutdown Margin.
Use 2-SOP-4.3.1, Spent Fuel Pit Cooling, to recirculate the Spent Fuel Pit by bleeding and feeding to the RWST.

Answer: A

Explanation/Justification:

A. Correct. TS Basis states >2000 ppm Boron is required. Correct procedure is used.

B. Incorrect. Plausible because >2000 ppm Boron is required but the wrong procedure is used.

C. Incorrect. Plausible because TS Basis does state that Keff will remain less than 0.95 if filled with 786 ppm boron but the wrong procedure is used.

D. Incorrect. Plausible because TS Basis does state that Keff will remain less than 0.95 if filled with 786 ppm boron. Also plausible because the correct procedure is used.

Technical References: 2-SOP-4.3.1
Proposed References to be provided: None

Learning Objective I2LP-ILO-SFP001 10
I2LP-ILO-SFP001 6

Question Source: Modified

Question History: VC Summer NRC 2002

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#	034000A302 Ability to monitor automatic operation of the Fuel Handling System, including: - Load limits	
	Importance	2.5	3.1

Question # 93

Operators are performing a full core off-load.

- As the manipulator crane operator raises a fuel element using the manipulator hoist, the overload light on the manipulator console comes on and the hoist motion stops.
- The manipulator crane operator noted that load indicator reading while moving was 2390 pounds which is below the overload limit of 2665 pounds.

Which ONE of the following is required by 2-SOP-17.30, "Manipulator Crane Operations" to defeat the interlock and what is the reason for the interlock?

A. Because overload is not valid, RSRO permission is not required to bypass the interlock. The overload interlock prevents damage due to an assembly getting hung up on adjacent element.

B. Because overload is not valid, RSRO permission is not required to bypass the interlock. The overload interlock prevents the gripper from disengaging and dropping the fuel assembly

C. The RSRO permission is required to bypass the interlock. The overload interlock prevents damage due to an assembly getting hung up on adjacent element.

D. The RSRO permission is required to bypass the interlock. The overload interlock prevents the gripper from disengaging and dropping the fuel assembly.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the overload is not valid and it prevents damage to an assembly getting hung up on adjacent elements.

B. Incorrect Plausible because the overload is not valid and student may believe the extra weight may cause the fuel element to drop from the gripper.

C. Correct because only the Refueling SRO has the authority to bypass an interlock and this is an apparent interlock malfunction.

D. Incorrect. Plausible because RSRO permission is required to bypass the interlock.

Technical References:	2-SOP-17.30
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-FHD001 19 I2LP-ILO-FHD001 5 I2LP-ILO-FHD001 9
Question Source:	Modified
Question History:	Turkey Point NRC 2008
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012132 Conduct of Operations - Ability to explain and apply all system limits and precautions.	
	Importance	3.8	4

Question # 94

Technical Specifications 3.4.9 states, the pressurizer shall be OPERABLE based on level and operating heater groups.

Which of the following is the T.S. basis for ≤ 65.1% and maintaining heaters operable?

A. ≤ 65.1% ensures a steam bubble to prevent water solid operation and heaters need to be operable to account for heat losses and maintain near operating conditions assuming failure of one emergency diesel generator.

B. ≤ 65.1% ensures a steam bubble to prevent water solid operation and heaters need to be operable to maintain adequate NPSH for RCP operation during a Steam Generator Tube Rupture or Main Steam Line Break.

C. ≤ 65.1% limits the amount of high energy water released from the RCS during a LOCA and heaters need to be operable to account for heat losses and maintain near operating condition s assuming failure of one emergency diesel generator.

D. ≤ 65.1% limits the amount of high energy water released from the RCS during a LOCA and heaters need to be operable to maintain adequate NPSH for RCP operation during a Steam Generator Tube Rupture or Main Steam Line Break

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Plausible because 65.1% ensures a steam bubble assuming maximum insurge; however the basis for heaters is not correct. It is desirable to operate RCP during a SGTR and MSLB.

C. Incorrect. Plausible because the amount of energy released is a concern for peak containment pressure during a LOCA; however, it is not the basis for this limit. The basis for the heaters is correct.

D. Incorrect. Plausible because the amount of energy released is a concern for peak containment pressure during a LOCA; however, it is not the basis for this limit. The basis for heaters is not correct. It is desirable to operate RCP during a SGTR and MSLB.

Technical References:	Tech Specs
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RCSPZR 14
Question Source:	Bank
Question History:	ANO NRC 2008
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012145 Conduct of Operations - Ability to identify and interpret diverse indications to validate the response of another indication.	
	Importance	4.3	4.3

Question # 95

Given the following:

- The plant experienced a Large Break LOCA 8 hours ago.
- The crew performed all actions in:
  - E-0 Reactor Trip or Safety Injection
  - E-1 Loss of Reactor or Secondary Coolant
  - ES-1.3 Transfer to Cold Leg Recirculation (via the Recirc Pumps)
  - ES-1.4 Transfer to Hot Leg Recirculation

Which of the following indications would direct the crew to transition to ECA-1.3, Loss of Emergency Coolant Recirculation Caused by Sump Blockage, and what actions will be directed in ECA-1.3?

	Indications	**Actions**
A.	• 480V Switchgear Motor Trip (Common) • Recirc Pump 21 control switch amber light lit	1. Throttle HCV-638 and 640 2. Close 888A and 888B
B.	• Low Head Injection Line Low Flow Alarm • Recirc Pump 21 control switch amber light lit	1. Throttle HCV-638 and 640 2. Close 888A and 888B
C.	• Reduced Low Head Injection Flow • Fluctuating amps on bus 3A	1. Secure High Head Safety Injection Pumps 2. Align RHR Pumps for Recirculation

D.	• SI Pump Suction Low Pressure Alarm • Recirc Sump level Indicates 49' 6"	1. Secure High Head Safety Injection Pumps 2. Align RHR Pumps for Recirculation

Answer: D

Explanation/Justification:

For this condition, the SI system is lined up for hot leg recirculation. The Recirc pumps are taking a suction on the recirc sump and discharging to the High Head Pumps and a reduced number of cold leg injection lines.

A.. Incorrect. Plausible because indication could mean a pump tripped due to loss of suction; however the indications are essentially the same condition (Breaker Tripped on overcurrent). Actions are also incorrect. Throttling 638 and 640 will help with sump blockage; however closing 888A and B will isolate suction supply to the running high head SI Pumps.

B. Incorrect. Plausible because the indications are consistent with a pump trip on low suction flow. Actions are incorrect. Throttling 638 and 640 will help with sump blockage; however closing 888A and B will isolate suction supply to the running high head SI Pumps.

C. Incorrect. Plausible because reduced low head injection flow is a possible indication of sump blockage; however the recirculation pumps are powered from 5A and 6A. Fluctuating amps on bus 3A is not consistent with cavitation of a recirculation pump. The actions are correct.

D. Correct.

Technical References: 2-ECA-1.3
Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPC13 1
I2LP-ILO-EOPC13 3

Question Source: Bank

Question History: NA

Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

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 # 96

Given:

- The crew is preparing for a reactor startup and has entered 2-POP-1.2 Reactor Startup.
- N31 Source Range Nuclear Instrument is indicating 4 cps and Operable
- N32 Source Range Nuclear Instrument is indicating 1 cps and Operable
- Both Intermediate Range Indicators are Operable

POP-1.2 Prerequisite 3.9 requires both Source Range Channels indicate at least 2.0 cps.

The Shift Manager has requested you to prepare a TPC to POP-1.2 to allow the startup with N36 less than 2.0 cps.

Which one of the following describes the type of procedure change and required approval authority?

A. This is considered an INTENT change. It must be approved by the Shift Manager/CRS and Responsible Procedure Owner only.

B. This is considered an INTENT change. It must be approved by the Shift Manager/CRS and Subject Matter or Technical Expert, and the Responsible Procedure Owner.

C. This is considered a NON-INTENT change. It must be approved by the Shift Manager/CRS or Responsible Procedure Owner.

D. This is considered a NON-INTENT change. It must be approved by the Shift Manager/CRS only.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because it is an INTENT change (change of scope); however INTENT changes require a Technical Review prior to use.

B. Correct.

C. Incorrect. Plausible because candidate may not recognize that this is an INTENT change. For a NON-INTENT change, either the SM/CRS or RPO can authorize use.

D. Incorrect. Plausible because candidate may not recognize that this is an INTENT change. For a NON-INTENT change, either the SM/CRS or RPO can authorize use.

Technical References:	IP-SMM-AD-102
Proposed References to be provided:	None
Learning Objective	I0WKB-ILO-ADM00 15
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012237 Equipment Control - Ability to determine operability and/or availability of safety related equipment.	
	Importance	3.6	4.6

Question # 97

Given the following:

- Reactor Power is 20%
- Control Bank D rods are at 100 steps
- ONE Control Bank D rod was dropped and recovered
- The P/A Converter could NOT be reset per 2-AOP-ROD-1, Rod Control and Position System Malfunctions AFTER recovering the dropped rod.

What effect will these events have on continued rod control system operation? As control rods are inserted ...

A. the ROD INSERTION LO-LO Limit Alarm will be received at a lower actual rod position. Per LCO 3.1.6 (Control Bank Insertion Limits) operation may continue as long as actual rod position can be verified above the insertion limit every 12 hours.

B. the ROD INSERTION LO-LO Limit Alarm will be received at a lower actual rod position. Per LCO 3.1.6 (Control Bank Insertion Limits) the alarm must be made operable within 2 hours or the plant be brought to Mode 3 in an additional 6 hours.

C. the ROD INSERTION LO-LO Limit Alarm will be received at a higher actual rod position. Per LCO 3.1.6 (Control Bank Insertion Limits) operation may continue as long as actual rod position can be verified above the insertion limit every 12 hours.

D. the ROD INSERTION LO-LO Limit Alarm will be received at a higher actual rod position. Per LCO 3.1.6 (Control Bank Insertion Limits) the alarm must be made operable within 2 hours or the plant be brought to Mode 3 in an additional 6 hours.

Answer: A

Explanation/Justification:

A. Correct. The P/A converter will have Bank D at 200 steps following rod recovery. The bank will be at 100. This will make the Rod Insertion Lo-Lo Limit alarm come in at lower actual rod position. LCO 3.1.6 (Control Bank Insertion Limits) is met as long as SR 3.1.6.3 (verify actual position) can be performed every 12 hours.

B. Incorrect but plausible. Shutdown would be required if actual position is below the insertion limit.

C. Incorrect but plausible if the candidate misunderstands how this failure affects rod control.

D. Incorrect but plausible if the candidate misunderstands how this failure affects rod control. Also see B.

Technical References:	Syst Desc 16.2 Tech Specs
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICRPI 14 I2LP-ILO-ICRPI 9

Question Source:	Bank
Question History:	IPEC Unit 3 2010
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012311 Radiological Controls - Ability to control radiation releases.	
	Importance	3.8	4.3

Question # 98

The operating crew is responding to a Steam Generator Tube Rupture. All systems responded properly. Which of the following is the preferred Post SGTR Cooldown procedure and why?

A. ES-3.1 Post SGTR Cooldown Using Backfill because it minimizes radiological releases, and it facilitates processing of contaminated reactor coolant.

B. ES-3.1 Post SGTR Cooldown Using Backfill because it minimizes radiological releases, and it is the fastest method of recovery.

C. ES-3.2 Post SGTR Cooldown Using Blowdown because it minimizes radiological releases, and it facilitates processing of contaminated reactor coolant.

D. ES-3.2 Post SGTR Cooldown Using Blowdown because it minimizes radiological releases and it is the fastest method of recovery.

Answer: A

Explanation/Justification:

ES-3.1 is the preferred method for Post SGTR Cooldown because it minimizes radiological releases. Ruptured SG water is forced back into the RCS where it is diverted to the liquid waste processing system; thereby, minimizing radiological release.

ES-3.2 directs the Ruptured SG water to the blowdown system. This will result in a release to the environment via the flash tank. A CAUTION at the beginning of the procedure states that an offsite dose evaluation should be completed prior to using this procedure.

A. Correct

B. Incorrect Plausible because correct procedure is in the answer

C. Incorrect Plausible because ES-3.2 is a procedure for post SGTR cooldown and “facilitates processing of contaminated reactor coolant” is correct.

D. Incorrect Plausible because ES-3.2 is a procedure for post SGTR cooldown

Technical References: 2-E-3 BG
Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE30 3

Question Source: Modified

Question History: Diablo Canyon NRC 2009

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 4

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012416 Emergency Procedures/Plan - Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, severe accident management guidelines.	
	Importance	3.5	4.4

Question # 99

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 200 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 200 psig, then transition to FR-P.1, Response to Imminent Pressurized Thermal Shock.

B. Transition to FR-P.1, "Response To Imminent Pressurized Thermal Shock".

C. Complete FR-C.2, "Response To Degraded Core Cooling", then transition to FR-P.1, "Response To Imminent Pressurized Thermal 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 sates 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: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012425 Emergency Procedures/Plan - Knowledge of fire protection procedures.	
	Importance	3.3	3.7

Question # 100

The control room has been evacuated due to a fire in the cable spreading room. The crew is performing the actions in 2-AOP-SSD-1.

Which of the following correctly identifies Time Critical actions in 2-AOP-SSD-1?

A. Establish Charging in 60 minutes
Isolate PORVs and Letdown within 5 minutes
Establish AFW within 60 minutes

B. Establish Charging in 60 minutes
Isolate PORVs and Letdown within 5 minutes
AFW within 30 minutes

C. Establish Charging in 30 minutes
Isolate PORVs and Letdown within 15 minutes
Establish AFW within 60 minutes

D. Establish Charging in 30 minutes
Isolate PORVs and Letdown within 15 minutes
Establish AFW within 30 minutes

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Letdown isolation is correct and, charging flow is correct; however, AFW is required within 30 minutes after the event.

B. Correct.

C. Incorrect. Plausible because AFW flow and Charging flow time requirements are reversed. Letdown isolation is required within 5 minutes

D. Incorrect. Plausible because AFW time is correct; however, charging flow is not required until 60 minutes and Letdown isolation is required within 5 minutes after the event.

Technical References:	2-AOP-SSD-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ASSD 12
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.43 (b) 5

Comments