

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000007A201	
		Ability to determine and interpret the following as they apply to a reactor trip: - Decreasing power level, from available indications	
	Importance	4.1	4.3

Question # 1

Given:

- Unit 2 was operating at 100% when the Main Turbine tripped, causing a reactor trip.
- The RO is performing the immediate actions of E-0, Reactor Trip or Safety Injection.

Of the following, which choice contains only the indications that will be used to determine that the reactor is tripped?

- Intermediate Range SUR ~ 0.3 dpm, Power Range NI 4%.
- Source Range SUR ~ 0.3 dpm, Intermediate Range SUR ~ 0.3 dpm.
- Source Range NI 10^4 cps, Intermediate Range NI 10^{-5} amps, Power Range NI 3%.
- Power Range NI 6%, Intermediate Range SUR ~ 0.3 dpm, Intermediate Range NI 10^{-5} amps.

Answer: A

Explanation/Justification:

A. Correct. Following the prompt drop from 100% power, Intermediate Range will indicate a -1/3 dpm startup rate and Power Range will be less than 6%.

B. Incorrect but plausible because the -1/3 dpm SUR is correct for the Intermediate; however, the source range NIs will not be energized.

C. Incorrect but plausible because indications for source and intermediate ranges are approximately equivalent; however the source range would not be energized. The power range indication is consistent with a reactor trips prompt drop.

D. Incorrect but plausible because 6% power is approximately correct for the "prompt drop" in power, but the procedure checks power less than 5%. Also, the expected SUR would be -1/3 dpm

Technical References: 2-E-0

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) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000008K101	
		Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: - Thermodynamics and flow characteristics of open or leaking valves	
	Importance	3.2	3.7

Question # 2

Given:

- Unit 2 is operating at 100% power steady state when a small leak develops on a PZR PORV.
- After the PZR Pressure Control system returns PZR pressure to normal, the following conditions exist:

PZR pressure: 2235 psig

PRT pressure: 5.3 psig

PRT temperature: 90° F

Determine the temperature downstream of the leaking PORV PRIOR to closing the PORV Block Valve.

- A. 162° F
- B. 212° F
- C. 228° F
- D. 240° F

Answer: C

Explanation/Justification:

Constant enthalpy. After being throttled across the PORV, the downstream temperature will be at saturation for the pressure it is at, which is PRT pressure. 5.3 psig + 20 psia.

Can either use the Mollier Diagram to intersect the 20 psia line with the Saturation Curve or go right to 20 psia in the Table 1 - Saturated Steam: Temperature Table and find 228.

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

Learning Objective

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#	0000092107	
		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 # 3

The reactor is tripped. Safety Injection is actuated. All equipment is operating as designed.

Which of the following describes the reason that RCPs are tripped on loss of RCS subcooling?

- A. Operation of RCPs during loss of subcooling may mask subsequent failures and give false indication of adequate RCS inventory.
- B. Loss of subcooling is an indication that a LOCA is in progress. Core uncover may occur due to increased RCS mass loss if RCPs were to trip later during the accident.
- C. RCP operation during loss of subcooling caused by a SBLOCA will eventually result in excessive peak fuel cladding temperatures.
- D. Once a loss of RCS subcooling occurs, ECCS flow provides more efficient RCS heat removal. Operation of the RCPs may impede the RCS inventory recovery provided by ECCS.

Answer: B

Explanation/Justification:

A. Incorrect but plausible because with RCPs operating, Natural Circulation Range RVLIS will indicate higher.

B. Correct total mass loss increases if RCPs are operated after saturation conditions reached at the break.

C. Incorrect but plausible because if the RCPs did trip at some later time, peak clad temperature could be exceeded. The timing is important and it is not an absolute as stated.

D. Incorrect but plausible because candidate may believe that the discharge pressure of the RCPs may restrict ECCS flow.

Technical References: 2-E-1
2-E-1 BG
3-E-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPGEN 1
I3LP-ILO-EOPRCP 2
I3LP-ILO-EOPRCP 5

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#	000011A115	
		Ability to operate and/or monitor the following as they apply to a Large Break LOCA: - RCS temperature and pressure	
	Importance	4.2	4.2

Question # 4

Which of the following indicates that a LBLOCA has occurred instead of a SBLOCA?

- A. RCS subcooling < 0°F.
- B. RCS temperature < 350°F.
- C. RCS pressure below the shutoff head of the RHR pumps.
- D. RCS pressure below the shutoff head of the HHSI pumps.

Answer: C

Explanation/Justification:

A Incorrect but plausible as there are numerous instances of requiring $>0^{\circ}\text{F}$ subcooling in EOPs, however, loss of subcooling alone is not indicative of a LBLOCA.

B Incorrect but plausible as MODE 3/4 transition point is 350° , as well as other places in EOPs which refer to 350°F .

C Correct in that if the break is off a size large enough to lower RCS pressure to where the RHR pumps are injecting, then it's a LBLOCA.

D Incorrect but plausible as it refers to an ECCS injection pump which would inject based on RCS pressure.

Technical References: 2-E-0

Proposed References to be provided: None

Learning Objective I2LP-ILO-SIS01 7

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#	000022A201	
		Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: - Whether charging line leak exists	
	Importance	3.2	3.8

Question # 5

Given the following condition:

- The plant is operating at 100% power

Subsequently, over a 15-minute period, the Team observes the following indications:

Parameter	Initial	Final
Tave	558.8	558.8
VCT Level	32	29
Pressurizer Level	45	43
Containment Radiation Monitor R2	4 mr/hr	33 mr/hr
Non-Regenerative HX outlet temperature	90	90
Non-Regenerative HX outlet flow	75	63
Charging flow	85	87
Regenerative HX Charging outlet temperature	468	367
Charging Header pressure	2405	2400
Component Cooling Water Surge Tank level	55	55

Which of the following events is occurring?

- Letdown line leak upstream of Regen Heat Exchanger.
- Charging line leak upstream of Regen Heat Exchanger.

- C. Charging line leak downstream of Regen Heat Exchanger.
- D. Letdown line leak downstream of Non-Regen Heat Exchanger.

Answer: A

Explanation/Justification:

A Correct

B Incorrect but plausible because if the leak were there, then Regen HX outlet temp would go up, as less cold charging flow would be going thru HX.

C Incorrect but plausible because if the leak were there then temp would not be affected.

D Incorrect but plausible because NRHX flow would not have lowered.

Technical References: 2-AOP-LEAK-1
3-AOP-LEAK-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-CVCS 1

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

This question meets the KA because it requires the candidate to evaluate charging and letdown conditions and determine whether a charging or letdown leak exists.

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000025K101	
		Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: - Loss of RHRS during all modes of operation	
	Importance	3.9	4.3

Question # 6

Given:

- Unit 2 is in MODE 5 with CETs at 195°F
- RHR is in service in Shutdown Cooling
- All RHR cooling is lost
- Neither RHR pump can be started

Which of the following conditions will preclude using Steam Generators to remove RCS decay heat IAW 2-AOP-RHR-1, Loss of RHR?

- PZR level is 5%.
- The RCS is intact.
- ALL MSIVs and Bypass valves are shut.
- Only ONE SG is intact and has feed and bleed capability.

Answer: A

Explanation/Justification:

A. Correct. Pressurizer level must be maintained $> 10\%$ for the RCS and SGs to be considered "coupled".

B. Incorrect but plausible because if the RCS was NOT intact it would preclude using SG as a heat sink

C. Incorrect but plausible because MSIVs and bypass valve provide a heat removal path to the condenser, but it is not necessary.

D. Incorrect but plausible because candidate may believe that one SG is not adequate as a heat sink.

Technical References: 2-AOP-RHR-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPRHR 3

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#	1	
	Group#	1	
	K/A#	000027K203	
		Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: - Controllers and positioners	
	Importance	2.6	2.8

Question # 7

Given:

- The plant is operating at 99% power when the controlling Pressurizer Pressure Channel PT-455 fails low.
- The ATC Reactor Operator takes manual control of the Master Pressure Controller to control pressure at 2235 psig.

With NO other operator action taken, determine the PORV functionality for PCV-456 and PCV-455C.

- Both PORVs will open automatically when required.
- Only PORV PCV-456 will open automatically when required.
- Only PORV PCV-455C will open automatically when required.
- Neither PORV PCV-455C or PCV-456 will open automatically when required.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because in if the Defeat Switch was in Defeat Channel 1&4 this would be true.

B. Correct.

C. Incorrect. Plausible because one channel is controlled from the controlling channel and the other is not. Candidate must know which PORV is controlled from the controlling channel.

D. Incorrect. Plausible because if the defeat switch is in Defeat 1&4 and channel 457 failed low this would be true.

Technical References:

Drawing
Syst Desc 1.4

Proposed References to be provided:

None

Learning Objective

I2LP-ILO-RCSPZR 5
I3LP-ILO-RCSPZR 5,6

Question Source:

Bank

Question History:

Unit 2 NRC 2016

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#	000029K306	
		Knowledge of the reasons for the following responses as they apply to the ATWS: - Verifying a main turbine trip; methods	
	Importance	4.2	4.3

Question # 8

Given:

- Unit 2 was operating at 100% power when a reactor trip signal failed to trip the reactor, and the reactor cannot be tripped.

Which of the following describes the FIRST indication that will be checked to verify the Main Turbine is tripped when performing 2-FR-S.1 Response to Nuclear Power Generation / ATWS and why?

- All MSIVs closed to verify AMSAC actuated
- All turbine stop valves closed to verify AMSAC actuated
- All MSIVs closed to prevent excessive cooldown
- All turbine stop valves closed to prevent excessive cooldown

Answer: D

Explanation/Justification:

The FIRST indication that will verify the turbine trip is all stop valves closed.

A. is incorrect because while it is a method used to trip the turbine if normal trip fails, it is not used to verify a turbine trip. The reason is also incorrect.

B. is incorrect but plausible because the indication is correct but the reason is incorrect..

C. is incorrect because while it is a method used to trip the turbine if normal trip fails, it is not used to verify a turbine trip. The reason is correct.

D. Correct

Technical References: 2-FR-S.1 BG

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFRS 1

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000038K308	
		Knowledge of the reasons for the following responses as they apply to the SGTR: - Criteria for securing RCP	
	Importance	4.1	4.2

Question # 9

Given:

- A reactor trip with SI has occurred
- The Team has just entered E-3, "Steam Generator Tube Rupture", due to the presence of SGTR symptoms
- The ATC reports that the subcooling criteria for tripping RCPs has been met
- The Team verifies that Safety Injection pumps are running and stop all Reactor Coolant Pumps

The RCPs were stopped to...

- reduce flow-induced vibration in the ruptured SG U-tubes, thereby preventing the rupture from increasing in size.
- protect against a misdiagnosis of the event, operator error, or the occurrence of a multiple-failure event scenario.
- minimize the heat input into the RCS, thereby helping to reduce RCS pressure to equilibrium with secondary pressure.
- ensure adequate core cooling. Adequate core cooling cannot be maintained during a SGTR with reactor coolant pumps running.

Answer: B

Explanation/Justification:

A. Incorrect but plausible because candidate may believe that increasing the size of the rupture is the primary concern.

B. Correct

C. Incorrect but plausible because RCPs do add heat to the RCS and cooling down is a strategy for success with a SGTR.

D. Incorrect but plausible because RCPs are tripped during a SBLOCA to minimize mass loss and SG overfill is a concern during SGTR.

Technical References: 2-E-3

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE30 1

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#	000040K201	
		Knowledge of the interrelations between the Steam Line Rupture and the following: - Valves	
	Importance	2.6	2.5

Question # 10

Given:

- Unit 2 has experienced a Main Steamline break from 100% power.
- The Reactor was tripped, the Main Turbine was tripped, and SI was initiated.
- All MSIVs were shut in E-0, Reactor Trip or Safety Injection.

While isolating the faulted SG in E-2, Faulted Steam Generator Isolation, the operator reports:

- 22 SG level is 10% wide range and lowering.
- 22 SG pressure is 0 psig.
- The remaining SG NR levels are all 5% and rising.
- The remaining SG pressures are 980 and rising.

Which of the following identifies:

- (1) What are the required actions associated with AFW flow to the faulted SG?
- (2) How steam valves to Turbine Drive AFW pump should be positioned

- (1) Isolate AFW flow to 22 SG
 - (2) Shut MS-41 (SG 22) ONLY
- (1) Isolate AFW flow to 22 SG
 - (2) Shut MS-41 (SG 22) AND MS-42 (SG 23)
- (1) Maintain AFW to 22 SG until at least one SG NR level is >10% in at least one SG.
 - (2) Shut MS-41 (SG 22) ONLY
- (1) Maintain AFW to 22 SG until at least one SG NR level is >10% in at least one SG.

(2) (2) Shut MS-41 (SG 22) AND MS-42 (SG 23)

Answer: A

Explanation/Justification:

On a steamline break, the faulted SG is isolated by, among other things, closing AFW supply valves and steam supply valves to TDAFW pump.

A Correct.

B Incorrect but plausible if it is thought that since the TDAFW pump is NOT the only available source of Aux Feed, that it is isolated from both steam supply sources.

C Incorrect but plausible if it is thought that at least one SG >10% is required before isolated AFW to faulted SG.

D Incorrect but plausible for reasons in B and C above.

Technical References: 2-E-2

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE20 1

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	0000542418	
		Emergency Procedures/Plan - Knowledge of the specific bases for EOPs.	
	Importance	3.3	4

Question # 11

Given:

- The unit was operating at 100% power.
- A malfunction in the lube oil system cause loss of both Main Boiler Feed Pumps
- The unit was manually tripped
- 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?

- 400 gpm within 30 minutes to prevent a transition to FR-H.1.
- 400 gpm within 10 minutes to ensure adequate heat removal.
- 760 gpm within 30 minutes to prevent a transition to FR-H.1.
- 760 gpm within 10 minutes to ensure adequate heat removal.

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 and 30 minutes is the time to establish AFW during Appendix R scenario. 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 and 30 minutes is the time to establish AFW during Appendix R scenario.

D. Correct.

Technical References: 2-E-0 BG

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE00 1

Question Source: Bank

Question History: Unit 2 NRC 2012

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#	000055A102	
		Ability to operate and/or monitor the following as they apply to a Station Blackout: - Manual ED/G start	
	Importance	4.3	4.4

Question # 12

A unit trip occurred from 100% power

At step 3 of E-0, Reactor Trip or Safety Injection, the crew transitioned to ECA-0.0, Loss of All AC Power:

- 138 kV and 13.8 kV are unavailable
- 21, 22, and 23 EDGs are not running.
- All 480 V buses are de-energized.

Which of the following actions is intended to start the emergency diesel generators?

- Manually actuate Safety Injection.
- Reset 480V Bus Lockout (86) relays
- Depress Blackout logic reset pushbuttons
- Placing 480 V bus normal supply breakers in trip pullout.

Answer: B

Explanation/Justification:

- A. Correct. The intent of this action is to send a different start signal to the EDGs.
- B. Incorrect but plausible because the 480V bus lockout relay will prevent auto closure of the EDG breaker, but not auto start of the EDG.
- C. Incorrect but plausible because the Blackout Relay is reset in AOP-138kV-1 when prepared to restore normal power to a 480V bus
- D. Incorrect but plausible because candidate may believe that the normal feed breakers must be open to satisfy undervoltage start logic for the EDG. In addition many breaker switches are placed in Trip Pull Out in ECA 0.0.

Technical References: 2-ECA-0.0

Proposed References to be provided: None

Learning Objective I2LP-ILO-EDGR 1

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#	000056K301	
		Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: - Order and time to initiation of power for the load sequencer	
	Importance	3.5	3.9

Question # 13

The unit was operating at 100%.

A unit trip occurred

All equipment operated as designed.

5 minutes later a fault occurred on the Station Aux Transformer.

Which of the following correctly states the order of and reasons for the response of Service Water, CCW, and AFW pumps when buses are re-energized?

- A. AFW pumps restart immediately due to SG Shrink (low level)
All SW pumps restart after short time delay to cool EDGs and Turbine Lube Oil
CCW pumps restart later to supply thermal barrier cooling
- B. AFW pumps restart immediately due to SG Shrink (low level)
Essential SW pumps restart after short time delay to cool EDGs
CCW pumps do not restart to prevent bus overload.
- C. CCW pumps restart first to supply thermal barrier cooling
Essential SW pumps restart after short time delay to cool EDGs
AFW pumps restart last to ensure adequate heat sink
- D. CCW pumps do not restart to prevent bus overload
All SW pumps restart after short time delay to cool EDGs and Turbine Lube Oil
AFW pumps restart last to ensure adequate heat sink.

Answer: C

Explanation/Justification:

A. Incorrect but plausible because the AFW pumps have an auto start on low SG level; however the low level start is blocked on a bus undervoltage/SI. Even though no accident exists only, Essential Service Water Pumps will restart after a time delay; also CCW does restart on a Blackout-Unit Trip. The sequence of starting is not correct.

B. Incorrect but plausible because the AFW pumps have an auto start on low SG level; however the low level start is blocked on a bus undervoltage/SI. Essential Service Water Pumps will restart after a time delay; also CCW does not restart on a Blackout withan SI. The sequence of starting is not correct.

C. Correct. CCW pumps sequence on at 6 seconds, 9 seconds and 11 seconds. SW pumps start after 15 seconds. AFW pumps sequence on at 25 and 30 seconds.

D. Incorrect but plausible because CCW does not restart on a Blackout with an SI. . Even though no accident exists only, Essential Service Water Pumps will restart after a time delay. AFW pumps do start last. The sequence of starting is correct.

Technical References:	Logic Unit 2 Sheet 8
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-EDS01 11
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000057A206	
		Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: - AC instrument bus alarms for the inverter and alternate power source	
	Importance	3.2	3.7

Question # 14

Given:

- Unit 2 is operating at 100% power
- PRZR Level Control is selected to Channel 2
- The following alarm is received in the Control Room: SDF 1-4 "21 OR 22 INVERTER TROUBLE"
- The Team determines that NIS NI Rack C6 (N32, N36 & N42) is deenergized along with numerous control board indications
- An attempt to restore the inverter in accordance with 2-AOP-IB-1, Loss of Power to an Instrument Bus, by pressing the ALTERNATE SOURCE TO LOAD button was unsuccessful

Which one of the following actions is required?

- Restore 22 Vital Instrument Bus by aligning to 22 DC power panel; remove inverter from service and restore letdown.
- Restore 22 Vital Instrument Bus by bypassing the inverter; control plant parameters manually as necessary and restore letdown.
- Trip the reactor; enter E-0, Reactor Trip Or Safety Injection, only if boration rate from RWST exceeds capability to control prior to restoring bus in accordance with AOP-IB-1.
- Trip the reactor and enter E-0, Reactor Trip or Safety Injection. Post trip, restore letdown and defeat containment pressure high-high bistable channel 2 in accordance with 2-AOP-IB-1.

Answer: B

Explanation/Justification:

A. Incorrect: 22 Inverter is normally aligned to 22 DC power panel and this has failed if the inverter is removed from service the DC bus can not supply the AC bus, plausible if they believe that there is an alternate way to align DC power to supply AC.

B. Correct: Per the ARP and AOP the operators will attempt to manually transfer the inverter using the Alternate Source pushbutton. If that does not work the next action is to bypass the inverter which is the only correct answer given.

D. Incorrect: Neither a Trip or defeat of containment pressure bistable is required per AOP or ARP. The bistable fails to un-actuated state for containment pressure high-high. There is a trip required if <P-10 due to loss of IRNI.

Plausible: Containment pressure bistable is affected but if power can not be restored action is to align alternate power from "topaz" inverter not defeat the bistable.

C. Incorrect: This is a trip criteria for loss of the 21 IB.

Plausible: Candidate might not recall loss of power effects.

Technical References: 2-AOP-IB-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPIB1 3

Question Source: Bank

Question History: NRC Unit 2 2008

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#	0000582420	
		Emergency Procedures/Plan - Knowledge of operational implications of EOP warnings, cautions, and notes.	
	Importance	3.8	4.3

Question # 15

A loss of all AC power occurred 15 minutes ago. The Appendix R Diesel is expected to be available to power 480V busses in 30 minutes. The BOP notes that 21 DC Voltage has dropped from 131V prior to the event to 126V. The team is concerned about a loss of vital AC instrument bus power due to depleting station batteries. Which of the following describes how this condition will be addressed by ECA-0.0, Loss of All AC Power?

- A. Since an ELAP (Extended Loss of AC Power) will NOT be declared, no actions will be directed by ECA-0.0 to shed loads.
- B. ECA-0.0 will direct shedding loads using AOP-DC-1, Loss of 125V DC Panel, and AOP-IB-1, Loss of Power to an Instrument Bus.
- C. ECA-0.0 will direct shedding loads using SOP-27.1.6, Instrument Bus, DC Distribution System And PA System Inverter
- D. ECA-0.0 will direct initiation of FSG-004, ELAP DC Bus Load Shed/Management, and FSG-007, Loss of Vital Instrumentation or Control Power.

Answer: B

Explanation/Justification:

Duplicated from question no 26783

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

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

B. Correct answer.

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

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

Technical References: 2-ECA-0.0

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPC00 3

Question Source: Bank

Question History: Unit 3 NRC 2017

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#	00WE04K101	
		Knowledge of the operational implications of the following concepts as they apply to the LOCA Outside Containment: - Components, capacity, and function of emergency systems	
	Importance	3.5	3.9

Question # 16

Following a reactor trip:

- RCS pressure is 1600 psig and lowering.
- Pressurizer level 10% and slowly lowering.
- Pressurizer spray valves are closed
- PRT parameters are: 50% level, 4 psig, 115°F and steady
- 21-24 steam generator water levels are: 22%, 27%, 24%, 31% and steady.
- AFW flows are 100 gpm, 105 gpm, 110gpm, 120 gpm.
- Primary auxiliary building radiation monitors are rising.
- Plant ventilation radiation monitors are rising.
- Containment pressure and sump levels are normal.

Based on these conditions, which of the following has occurred and what procedure will be used to mitigate it?

- A. Faulted Steam Generator, E-2
- B. Ruptured Steam Generator, E-3
- C. LOCA Outside Containment, ECA-1.2
- D. LOCA Inside Containment, E-1

Answer: C

Explanation/Justification:

A. Incorrect: No indication of steam/feed leak. In particular AFW flow rates and SG levels are responding normally and a steam leak would not result in elevated radiation levels.

Plausible: A loss of secondary coolant could cause a lowering of RCS pressure.

B. Incorrect: No indication of tube rupture. In particular AFW flow rates and SG levels are responding normally

Plausible: A SGTR could cause low RCS pressure and some elevation of secondary radiation levels.

C. Correct: Elevated radiation levels outside the containment and lowering RCS pressure with no evidence of a SGTR leaves a LOCA outside containment.

D. Incorrect: Containment parameters are not indicative of a LOCA inside containment.

Plausible: Large LOCA's can elevate radiation levels outside containment.

Technical References:	2-E-0
	2-E-1
	2-ECA-1.2

Proposed References to be provided:	None
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Learning Objective	I2LP-ILO-EOPC10 1
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Question Source:	Bank
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Question History:	Unit 2 NRC 2008
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 8
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	00WE05A103	
		Ability to operate and/or monitor the following as they apply to the Loss of Secondary Heat Sink: - Desired operating results during abnormal and emergency situations	
	Importance	3.8	4.2

Question # 17

Given:

- The unit was operating at 100% power
- The unit was tripped when both Main Boiler Feed Pumps tripped.
- AFW failed to actuate.
- The crew entered FR-H.1, Loss of Heat Sink.
- When conditions were met, the crew initiated Bleed and Feed cooling.

Which of the following gives the desired condition(s) to start the SI flow reduction sequence?

- When CETs < 355°F and lowering
- When level in at least 1 SG is $\geq 10\%$ NR.
- When feed flow to at least 1 SG is ≥ 200 gpm.
- When RCS pressure is < 1500 psig and HHSI flow is indicated.

Answer: B

Explanation/Justification:

A. Incorrect but plausible because 345 is the temperature below which RHR can be placed in service.

B. Correct.

C. Incorrect but plausible because following a normal AFW actuation the SGs are feed at approximately 200 gpm until the operator takes control.

D. Incorrect but plausible because HHSI flow will start at approximately 1500 psig. That will not be an adequate heat sink.

Technical References: 2-FR-H.1

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFRH 4

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	00WE11K202	
		Knowledge of the interrelations between the Loss of Emergency Coolant Recirculation and the following: - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	
	Importance	3.9	4.3

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 2-ECA-1.1, how are the accumulators controlled and at what pressure do we stop depressurizing SGs?

- A. Slowly Inject accumulators into the RCS
Stop depressurizing at 170 psig
- B. Rapidly Inject accumulators into RCS
Stop depressurizing at 170 psig
- C. Slowly Inject accumulators into the RCS
Stop depressurizing at 350 psig
- D. Rapidly Inject accumulators into RCS.
Stop depressurizing at 350 psig

Answer: A

Explanation/Justification:

A Correct.

B. Incorrect but plausible some EOPs rapidly depressurize to rapidly inject accumulators. ECA-1.1 slowly injects the accumulators. The stopping pressure is correct.

C Incorrect but plausible because ECA-1.1 does slowly inject the accumulators, but 366 is not the correct value however it is the correct value to put RHR in service

D Incorrect. Incorrect but plausible some EOPs rapidly depressurize to rapidly inject accumulators. ECA-1.1 slowly injects the accumulators. 366 is not the correct value however it is the correct value to put RHR in service

Technical References:	2-ECA-1.1 2-ECA-1.1 BG
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Proposed References to be provided:	None
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Learning Objective	I2LP-ILO-SIS01 2
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Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 8
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	000005K305	
		Knowledge of the reasons for the following responses as they apply to the Inoperable/Stuck Control Rod: - Power limits on rod misalignment	
	Importance	3.4	4.2

Question # 19

Given:

- Unit 2 was performing a power reduction from 100% to 80% power.
- During the power reduction it was identified that a single control rod was misaligned from its group demand counter by more than the permissible amount in Tech Spec Table 3.1.4-1.
- A power reduction to 74% was performed to comply with LCO 3.1.4 Rod Group Alignment Limits, Action B.2.2.

Which of the following describes the bases for performing the Tech Spec required power reduction?

The power reduction was performed to ...

- prevent radial flux from exceeding Tech Spec limits..
- prevent Xenon oscillations from developing as power production shifts in the core.
- ensure that Peaking Factors, will not cause the core design criteria to be exceeded.
- ensure that safety analyses assumptions for SDM are preserved.

Answer: C

Explanation/Justification:

The K/A asks for knowledge of the reasons for the power limits on rod misaligned, not what the limit is.

A Incorrect but plausible because it is a possible result of having a rod misaligned however the power reduction for QPTR is based on 3% for every % QPTR exceeds 1.00.

B Incorrect but plausible because Xenon is localized concern for a dropped rod; however an oscillation is not expected.

C is correct per (B.3.1.4)

D is incorrect as it is the bases for Rod Insertion Limits. (B3.1.6)B is incorrect as it is not listed in the bases doc as a reason for reducing power .

Technical References: Tech Specs

Proposed References to be provided: None

Learning Objective I2LP-ILO-ICROD 10

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#	000028K303	
		Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunctions: - False indication of PZR level when PORV or spray valve is open and RCS saturated	
	Importance	3.5	4.1

Question # 20

Given:

- A PZR Safety Valve has failed open
- Reactor Trip and Safety Injection have occurred.
- All equipment is operating as designed.
- RCS pressure is currently 1300 psig and lowering.
- The crew is performing actions of 2-E-0, Reactor Trip or Safety Injection
- PZR Level is 100%

Which ONE of the following describes the reason for the pressurizer level indication for this event?

- Steam from hot leg creates false indication of solid pressurizer.
- Steam Bubble in the Reactor Head forces water into pressurizer.
- Safety Injection mass addition greater than steam through safety rapidly fills pressurizer.
- Cold safety injection water rapidly expands as it is heated rapidly filling the pressurizer

Answer: B

Explanation/Justification:

A. Incorrect but plausible because at TMI steam flow through the pressurizer held the water in the pressurizer. Indication was real but not a reflections of RCS mass.

B. Correct. but plausible because the water in the reactor vessel head flashes to steam (IPEC is a Thot plant) at approximately 1400 - 1500 psig water is forced into the pressurizer.

C. Incorrect but plausible because at approximately 1500 psig, the Safety Injection pumps will supply water to the RCS. Even with mass flow into the RCS greater than mass flow out, the level response will not be rapid.

D. Incorrect but plausible because cold water from the RWST will heat up as it enters the RCS. This will not be enough to cause the rapid level change in the pressurizer.

Technical References: 2-ES-0.2 BG

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE10 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#	2	
	K/A#	0000322402	
		Emergency Procedures/Plan - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. Note: The issue of setpoints and automatic safety features is not specifically covered in the systems sections.	
	Importance	4.5	4.6

Question # 21

The unit was operating at 100% power.

PR N44 was removed from service due to erratic operation.

Subsequently:

- PR channel N41 Instrument Power Fuse blew.
- The reactor tripped and the crew responded in accordance with E-0 and transitioned to ES-0.1

Approximately 30 minutes later the STA reported a YELLOW path condition on Subcriticality.

- Intermediate Range SUR is NOT less than -0.2DPM
AND
- Source Range is not energized

At this time:

- Remove Power Range channel N41 from service to re-energize Source Range detectors.
- Remove both Intermediate Range Control Power fuses to remove P-6 permissive.
- Manually reenergize the Source Range NIs by HV MANUAL switches to ON on Source Range drawers.
- Initiate emergency boration to lower Intermediate Range power to below P-6 setpoint.

Answer: C

Explanation/Justification:

The loss of 2/4 Power Range NIs trips the P-10 bistable blocking the re-energization of the Source Range NIs.

A. Incorrect but plausible because this is what is done if the Intermediate Range NIs are undercompensated. This action will not work because the malfunction is in the Power Range NIs.

B. Incorrect but plausible because this would cause IR power to go to zero; however the malfunction is in the Power Range NIs.

C. Correct.

D. Incorrect but plausible because Boration is the procedural direction if SR SUR is not zero or negative.

Technical References: 2-FR-S.2

Proposed References to be provided: None

Learning Objective I2LP-ILO-ICEXC 4

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#	1	
	Group#	2	
	K/A#	000060A101	
		Ability to operate and/or monitor the following as they apply to the Accidental Gaseous Radwaste Release: - Area radiation monitors	
	Importance	2.8	3

Question # 22

Given:

- The unit is preparing for refueling.
- R-27 Plant Vent Wide Range Gas Monitor is increasing
- R-44 Plant Vent Radio Gas is in alarm.
- R-50 Gas Decay Tank Activity is stable
- R-4 Unit 2 Charging Pump Room is in alarm
- R-5987 Breaker Service Access is stable

Which of the following events has occurred?

- A. VCT Relief Valve lift
- B. VCT vapor space leak
- C. Waste Gas Compressor discharge relief valve lift
- D. Waste Gas Compressor discharge line leak.

Answer: D

Explanation/Justification:

Radiation Monitors R-27, R-44, and R-50 are process radiation monitors. R-4 and R 5987 are area radiation monitors. Discharge of radioactive gas will cause local area radiation monitors to increase.

A. Incorrect but plausible because if the relief valve discharged to the VCT room, R-27 and R-44 would increase; however, the relief valve discharges to the Vent Header.

B. Incorrect but plausible because a tank vapor space leak would cause R-27 and R-44 to increase, but the VCT is located above the charging pumps and gas will not cause R-4 to alarm.

C. Incorrect but plausible because the relief valve discharges to the waste gas vent header not the local area.

D. Correct. A leak on the discharge of the waste gas compressors will discharge gas in the vicinity of R-4.

Technical References:	Drawing
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-GWR01 6 I2LP-ILO-RMS001 4
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000068A205	
		Ability to determine and interpret the following as they apply to the Control Room Evacuation: - Availability of heat sink	
	Importance	4.2	4.3

Question # 23

Given:

- The Unit 2 is operating at 100% power.
- 23 AFW Pump is tagged and disassembled.

Subsequently:

- A fire in the 480V Switchgear Room forced evacuation of the control room.
- All 480 V Buses are de-energized.
- The reactor, main turbine, MBFP's and RCP's are tripped.
- 21 AFW pump tripped after starting and remains tripped.
- All other App R equipment is available including 12FD3.

Which one of the following correctly describes the availability of a secondary heat sink?

- A. ONLY 21 SG and 22 SG are available for use with 22 AFW pump.
- B. ONLY 23 SG and 24 SG are available for use with 22 AFW pump.
- C. ALL SGs are available for use with 22 AFW pump, however only 21 SG and 22 SG will be used.
- D. ALL SGs are available for use with 22 AFW pump, however only 23 SG and 24 SG will be used.

Answer: C

Explanation/Justification:

Duplicated from question no 26611- used stem, modified it to make only 22 AFW pump available. Replaced ALL choices to reflect KA asking about availability of heat sink not maintenance of heat sink.

Aux feed will be established if possible from the control room prior to evac, with 21 or 22 AFW pump supplying 21 and 22 SG's. Attachment 2 Conventional Side RO Actions will further explain how to use AFW to feed only 21 and 22 SGs.

A Incorrect but plausible because the TDAFW pump CAN supply ALL SGs, it is preferred to feed 21 and 22 because they are the only 2 which have Wide Range level at RSD.

B Incorrect but plausible because 23 and 24 SG are fed from 23 AFW pump.

C Correct 21 and 22 SGs have indication on Remote Shutdown Panel 23 and 24 do not.

D Incorrect but plausible because all SG are available with 22 AFW pump in service, however 21 and 22 SGs are used.

Technical References: 2-AOP-SSD-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-MFW001 10

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#	000076K201	
		Knowledge of the interrelations between the High Reactor Coolant Activity and the following: - Process radiation monitors	
	Importance	2.6	3

Question # 24

The plant is operating at 100% Power.

ALL of the following have occurred:

A plant shutdown is in effect due to RCS Activity greater than Tech Spec limits.

Radiation Monitor R-47 is in alarm

RCV-017, CCW Surge Tank Vent Valve has automatically closed.

Which of the following events could have caused these conditions to occur and what is the appropriate procedure to address the condition?

- A. Tube leak in RCP Seal Return HXs
Go to 2 AOP-RCP-1, Reactor Coolant Pump Malfunctions
- B. Tube leak in RCP Seal Return HX
Go to 2-AOP-LICCW-1 Leakage into Component Cooling System
- C. Tube leak in Non-regenerative HX
Go to 2-AOP-CCW-1, Loss of Component Cooling Water
- D. Tube leak in Non-regenerative HX
Go to 2-AOP-LICCW-1 Leakage into Component Cooling System

Answer: D

Explanation/Justification:

The only auto closure signal for RCV-017 is high activity on Radiation Monitor R-47.

A. Incorrect but plausible because an operator may not recall the pressure differences involved. Seal return is from RCS, but it is essentially VCT pressure at this point. In addition AOP-RCP-1 is not the correct procedure to address this condition.

B. Incorrect, but plausible for the same reasons as A. AOP-LICCW-1 is the correct procedure to address this condition.

C. Incorrect but plausible because a leak in the Non-regenerative heat exchanger will cause leakage into CCW and may cause RCV-017 to auto close. Incorrect because AOP-CVCS-1 is not the correct procedure to address this condition.

D Correct. A leak in the Non-regenerative heat exchanger will cause leakage into CCW and may cause RCV-017 to auto close. AOP-LICCW-1 is the correct procedure to address this condition.

Technical References: 2-AOP-LICCW-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPLIC 1

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#	2	
	K/A#	00WE08K102	
		Knowledge of the operational implications of the following concepts as they apply to the Pressurized Thermal Shock: - Normal, abnormal and emergency operating procedures associated with Pressurized Thermal Shock	
	Importance	3.4	4

Question # 25

Given:

- A LOCA had occurred from HOT STANDBY conditions, Tave at 547°F, 30 minutes ago
- RCS pressure is 125 psig
- RCS Core Exit TCs read 380°F
- RCS Cold Leg temperatures are all 220°F
- 21 SI Pump is running providing 325 gpm flow
- 21 RHR Pump is running providing 1150 gpm flow
- RWST Level is 13 ft. and trending down
- E-0, Reactor Trip or Safety Injection, Attachment 1 is complete

What is the appropriate action to take in response to the above conditions?

Entry into FR-P.1, Response to Pressurized Thermal Shock Condition, is ...

- NOT required since RCS pressure is below 350 psig.
- made but NO actions are implemented before returning to procedure in effect.
- made and a RCS temperature soak for a ONE hour period will be completed.
- made and cooldown will continue within a limit of 50°F in any 60 minute period.

Answer: B

Explanation/Justification:

For these conditions, FR-P.1 will be entered, but the procedure will direct the team to go back to procedure and step in effect.

A. Incorrect but plausible. Since no actual actions are taken in FR-P.1, it is plausible a candidate would think entry is not required.

B. Correct answer.

C. Incorrect but plausible since these are actions in FR-P.1.

D. Incorrect but plausible since these are actions in FR-P.1.

Technical References: 2-FR-P.1
2-FR-P.1 BG
3-FR-P.1

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFRP 4

Question Source: Bank

Question History: Unit 3 NRC 2006

Question Cognitive Level: Comprehension

10 CFR Part 55 Content: 55.43 (b) 5

Comments:

KA match because the question makes the candidate determine that a LBLOCA is occurring and then determine that the actions for the LOCA take precedence over the overcooling event that is also occurring.

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

Given:

- A major storm has caused a loss of 138kV off-site power.
- The Reactor tripped
- Con Ed reported restoration will take several days.
- 13.8kV is supplying 6.9kV buses
- CRDM fans are not available
- During the cooldown PRZR level rapidly increased to 100%
- The crew was unable to collapse the steam void in the vessel
- The crew is at step 16 of ES-0.2

Which of the following describes the crew actions?

- Remain in ES-0.2 and maximum cooldown rate $<25^{\circ}\text{F} / \text{HR}$
- Transition to ES-0.3 and maximum cooldown rate $<25^{\circ}\text{F} / \text{HR}$
- Remain in ES-0.2 and maximum cooldown rate $<100^{\circ}\text{F} / \text{HR}$.
- Transition to ES-0.3 and maximum cooldown rate $<100^{\circ}\text{F} / \text{HR}$.

Answer: D

Explanation/Justification:

A. Incorrect but plausible because 25° is correct in ES-0.2 if no CRDM fans can be operated. MCC 28 is powered from bus 5A and supplies all CRDM Fans, but MCC28A can also supply all fans and it is powered from bus 2A. The crew must transition to a procedure that monitors the void.

B. Incorrect but plausible because 25° is correct in ES-0.2 if no CRDM fans can be operated. The crew must transition to a procedure that monitors the void, thus ES-0.3 would be correct; however the cooldown rate is 100°F/hr

C. Incorrect but plausible because 100°F/hr is correct cooldown rate, however, the crew must transition to a procedure that monitors the void.

D. Correct 100°F/hr is correct in 2-ES-0.3, Natural Circulation Cooldown With Steam Void In Vessel (With RVLIS)

Technical References:	2-ES-0.2
	2-ES-0.3
	2-ES-0.4

Proposed References to be provided:	None
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Learning Objective	I2LP-ILO-EOPS00 3
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 10
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	00WE15A103	
		Ability to operate and/or monitor the following as they apply to the Containment Flooding: - Desired operating results during abnormal and emergency situations	
	Importance	2.8	3

Question # 27

Given:

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

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

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

Answer: C

Explanation/Justification:

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

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

C. Correct.

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

Technical References: 2-FR-Z.2
2-FR-Z.2 BG

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFRZ 4

Question Source: Bank

Question History: Unit 2 NRC 2004

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 9

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	003000K505	
		Knowledge of the operational implications of the following concepts as they apply to the RCPS: - The dependency of RCS flow rates upon the number of operating RCPs	
	Importance	2.8	3

Question # 28

GIVEN:

- Unit 1 is in MODE 4
- Three RCPs are running

Which of the following describes the expected RCS flow indication?

	Idle Loop Flow Indication	Operating Loop Flow Indication
A.	approximately 0%	approximately 100%.
B.	approximately 0%	approximately 106%.
C.	approximately 18%	approximately 100%.
D.	approximately 18%	approximately 106%.

Answer: D

Explanation/Justification:

Flow in the operating loops increases to 106%. Flow in the idled loop indicates 18%, which is actually -18% (reverse flow). If an RCP is stopped, the high pressure discharge of the other three pumps forces the coolant to flow backwards through the newly idled loop. Due to the reduced backpressure of the idle loop, the flow rate in each of the operating loops increases from 100% to about 106% of rated flow. The idle loop has an equivalent flow of about 18%, in the reverse direction. Total core flow will decrease since only three RCPs are operating, and some of their flow is bypassing the core through the idle loop.

A and B incorrect. If candidate knows there is reverse flow and bottom of scale is zero, then it would be plausible to think that the meter would read downscale, or zero.

C incorrect. Indicated flow in the loops with running pumps is greater than 100%.

D is correct. Indicated flow in the idle loop, is the reverse flow indication of approximately 18% and flow in the operating loops is greater than 100% or approximately 106%

Technical References:

Proposed References to be provided: None

Learning Objective	I2LP-ILO-RCS001 5 I2LP-ILO-RCSRCP 5
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Question Source:	Modified
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Question History:	Diablo Canyon 2012
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 14
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	004000K509	
		Knowledge of the operational implications of the following concepts as they apply to the CVCS: - Thermal shock: high component stress due to rapid temperature change	
	Importance	3.7	4.2

Question # 29

Given the following conditions:

- The plant is in MODE 3, at normal operating pressure and temperature.
- The crew is initiating auxiliary spray in accordance with 2-SOP-1.4, Pressurizer Pressure Control.
- The operator is verifying spray line delta T is acceptable.

Which ONE (1) of the following is the MINIMUM allowable regenerative heat exchanger outlet temperature for Auxiliary Spray initiation under these conditions?

- A. 230°F
- B. 260°F
- C. 320°F
- D. 340°F

Answer: D

Explanation/Justification:

To prevent thermal shock to the spray nozzle do NOT initiate Aux Spray flow if the temperature difference between PZR vapor space and the outlet of the Regen Hx is > 320°F.

- A. Incorrect. This uses RCS cold leg temperature (547°F and subtracts 320).
- B. Incorrect. This uses RCS cold leg temperature and 300°F
- C. Incorrect. This is 651°F minus 330°F.
- D. Correct. Pressurizer temperature is approximately 651°F (2235 psig) and subtracts 340 = 311.

Technical References:

Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSPZR 11

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#	004000K304	
		Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: - RCPS	
	Importance	3.7	3.9

Question # 30

Given:

- Indian Point 2 has just experienced a loss of all CVCS charging capability while at power.
- The operating crew isolated CVCS letdown flow and has entered the appropriate Technical Specification action statements.

How is RCP operation affected by the loss of charging flow?

- RCP operation may continue while restoring RCP Seal Injection, since Thermal Barrier Cooling is in service.
- The RCPs must be immediately tripped to prevent damage to the RCP seal packages from uncontrolled heatup.
- RCP operation may continue while restoring RCP Seal Injection since the number 2 seal is now a film riding seal.
- The RCPs must be immediately tripped to prevent damage to the RCP seal packages via contaminants from the RCS backflowing into the RCP Seals.

Answer: A

Explanation/Justification:

A is correct as the thermal barrier is designed to cool rcs flow through it to the seal package.

B is incorrect but plausible if it is thought high temperature RCS fluid will enter the seal package.

C is incorrect but plausible if it is thought that a number 1 seal failure will occur.

D is incorrect but plausible if it is thought that this true event should cause operators to immediately shutdown RCPs.

Technical References:

Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSRCP 11

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#	005000K412	
		Knowledge of RHRS design feature(s) and/or interlock(s) which provide for the following: - Lineup for piggyback mode with CSS	
	Importance	3.1	3.7

Question # 31

Which one of the following describes the normal Containment Spray flowpath during the recirculation phase of operation?

- A. Water is recirculated from the Safety Injection pump discharge to the Containment Spray suction headers.
- B. Water is recirculated from the Containment Sump to the suction of the Containment Spray pumps.
- C. Water is recirculated from the Recirc Sump by the Recirc Pumps to the Containment Spray header.
- D. Water is recirculated from the Recirc Sump by the RHR pumps to the suction of the Containment Spray pumps.

Answer: C

Explanation/Justification:

At Indian Point, containment spray pumps take a suction only from the RWST. When the RWST is empty, continued containment spray is provided by securing the spray pumps and diverting some recirculation flow to the Spray Headers. Recirc flow is provided by Recirculation Pumps or RHR pumps.

A. Incorrect but plausible because recirculation flow can be diverted to the suction of the Safety Injection pumps for high head recirculation or hot leg recirculation. Safety injection pumps do not connect to the Containment Spray system.

B. Incorrect but plausible because the containment sump supplies water to the RHR pumps suction.

C. Correct. When the RWST is empty, normal spray pumps are secured and recirculation flow is directed to the spray header if necessary. Normally recirculation flow is provided from the recirculation pumps (not RHR).

D. Incorrect but plausible because recirculation flow is provided to the spray system; however, it is directed to the discharge of the pumps.

Technical References:	Drawing
Proposed References to be provided:	None

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	I3LP-ILO-RHR001 1
	I3LP-ILO-RHR001 3

Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	006000K202	
		Knowledge of bus power supplies to the following: - Valve operators for accumulators	
	Importance	2.5	2.9

Question # 32

Given:

- Unit was operating at 100% power
- 23 EDG is OOS
- Bus 5A de-energized due to a fault
- SBLOCA occurred resulting in a reactor trip and safety injection.
- The crew is at the step to check if SI Accumulators can be isolated.

Assuming subcooling and pressurizer level requirements are satisfied, which of the following is correct for the SI Accumulator isolation actions?

- A. 894 A & C are closed; 22 and 24 Accumulator are vented
- B. 894 B & D are closed; 21 and 23 Accumulator are vented
- C. All Accumulators are isolated
- D. All Accumulators are vented

Answer: D

Explanation/Justification:

Indian Point Unit 2 has 3 Safeguards buses 5!, 2A/3A and 6A. While 2 buses are assumed energized in accident analysis, the emergency procedures will function if one bus is energized. Some safeguards equipment is powered from 2A/3A which remains energized in this question.

The accumulator isolation valves 894 A & C are powered from MCC26A and 894 B & D from MCC26B. MCC26A is powered from bus 5A and MCC26B is powered from bus 6A. With bus 5A de-energized, MCC26A is de-energized and bus 6a is de-energized from 23 EDG OOS.

All distractors are plausible because the candidate must recall which valves are powered from which MCC and which 480V bus supplies which MCC.

Technical References: 2-ES-1.2

Proposed References to be provided: None

Learning Objective I2LP-ILO-SIS01 6

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	007000K401	
		Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: - Quench tank cooling	
	Importance	2.6	2.9

Question # 33

Given:

- PRT Temperature is 195°F
- PRT Level is 75%
- PRT Pressure is 8 psig.

How are PRT level and temperature lowered in accordance with 2-SOP-1.6, Pressurizer Relief Tank Operations?

- Drain to RCDT pump, vent the PRT.
- Drain to RCDT pump, spray the PRT.
- Drain to VC sump, vent the PRT.
- Drain to VC sump, spray the PRT.

Answer: D

Explanation/Justification:

Duplicated from question no 26881 to make Unit 2 specific

2-SOP-1.6, PRT Operations, Section 4.5, PRT Temperature Control, says to lower level by draining to VC sumop due to the temperature of the PRT. Makeup is supplied via the 519, 552, and 560 valves, above the expected water line, hence "spray". Each of the distracters contains either the incorrect drain path or makeup method, or both.

Drawing 9321-F-2719 shows relationship between PRT, RCDT, RCDT pumps, containment sump, and Rx sump.

Technical References: 2-SOP-1.6

Proposed References to be provided: None

Learning Objective I2LP-ILO-RCSPZR 2

Question Source: Bank

Question History: Unit 3 NRC Retake 2018

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#	008000A102	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCWS controls including: - CCW temperature	
	Importance	2.9	3.1

Question # 34

The component cooling water temperature was 92°F when RHR was initially placed in service at 0100. The component cooling water system temperature is increasing at 0.5°F per minute due to decay heat.

If the rate of temperature rise remains constant, when will the maximum allowable CCW temperature for the initial phase of RHR operation be reached?

- A. 0136
- B. 0156
- C. 0236
- D. 0256

Answer: B

Explanation/Justification:

The normal maximum CCW temperature is 110°. During the initial phase of RHR operation the maximum CCW temperature is allowed to rise to 120°. CCW also has a maximum pump suction temperature of 155°.

- A. Incorrect but plausible because this would be correct for the normal maximum temperature of 110.
- B. Correct.
- C. Incorrect but plausible because if the candidate confuses suction temperature limit of 155° as the maximum, this would be correct.
- D. Incorrect but plausible because this would be correct if the candidate believed that 150° was the maximum limit.

Technical References:	2-SOP-4.1.2 3-SOP-RHR-001
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Proposed References to be provided:	None
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Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	010000K202	
		Knowledge of bus power supplies to the following: - Controller for PZR spray valve	
	Importance	2.5	2.7

Question # 35

A fault has resulted in the loss of 23 static inverter. Which of the following describes the impact of this loss?

- A. Trip the Reactor.
Automatic and manual control of pressurizer heaters and spray IS NOT available.
- B. Trip the Reactor.
Automatic control of pressurizer pressure is lost.
Manual control of heaters and spray IS available
- C. Establish Stable Plant Conditions
Automatic and manual control of pressurizer heaters and spray IS NOT available.
- D. Establish Stable Plant Conditions
Automatic control of pressurizer pressure is lost.
Manual control of heaters and spray IS available

Answer: A

Explanation/Justification:

The loss of power from 23 Instrument Bus will not DIRECTLY cause a reactor trip; however it results in loss of multiple control systems. Because of the loss of multiple control systems, the AOP directs a reactor trip. For all other instrument bus losses the AOP allows continued operation depending on plant conditions.

A. Correct. 23 Instrument Bus supplies the Pressurizer Master Pressure controller and both pressurizer spray valves (i.e. heaters and spray valves cannot be operated).

B. Incorrect but plausible because candidate may believe the master pressure controller and individual spray valves controllers are powered from different instrument buses.

C. Incorrect but plausible because stabilizing plant conditions is correct for loss of 21, 22, and 24 instrument buses. The pressurizer control is correct.

D. . Incorrect but plausible because stabilizing plant conditions is correct for loss of 21, 22, and 24 instrument buses. Also, candidate may believe the master pressure controller and individual spray valves controllers are powered from different instrument buses.

Technical References: 2-AOP-IB-1

Proposed References to be provided: None

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Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	012000K301	
		Knowledge of the effect that a loss or malfunction of the RPS will have on the following: - CRDS	
	Importance	3.9	4

Question # 36

Which of the following are affected if a malfunction prevents actuation of Reactor Protection Train "B"?

- A. Reactor Trip Breaker 'A'
Reactor Trip Bypass Breaker 'B'
- B. Reactor Trip Breaker 'A'
Reactor Trip Bypass Breaker 'A'
- C. Reactor Trip Breaker 'B'
Reactor Trip Bypass Breaker 'A'
- D. Reactor Trip Breaker 'B'
Reactor Trip Bypass Breaker 'B'

Answer: C

Explanation/Justification:

The candidate must understand how the reactor trip and bypass breakers are physically arranged and which breakers are associated with which protection train to ensure a trip during testing.

RPS Train A is associated with Rx Trip Breaker A and Bypass Breaker B

RPS Train B is associated with Rx Trip Breaker B and Bypass Breaker A

All distractors are plausible because the reactor protection train A or B and reactor trip breakers are not exactly matched.

Technical References:	Drawing
Proposed References to be provided:	None

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Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	013000K601	
		Knowledge of the effect of a loss or malfunction of the following will have on the ESFAS: - Sensors and detectors	
	Importance	2.7	3.1

Question # 37

Given the following conditions:

- The plant is at 80% power.
- Containment Pressure transmitter 948A has failed low.

Which of the following statements describes the effect of blocking HI-HI Containment Pressure relays when performing AOP-INST-1, Instrument or Controller Failures?

- Blocks the actuation of safety injection from containment high pressure when the bistables are tripped.
- Reduces the containment spray actuation coincidence such that 1 out of 2 additional channel from either set greater than the setpoint will cause Containment Spray
- Reduces the containment spray actuation coincidence to 1 out of 2 on one set and 2 out of 3 in second set greater than setpoint to actuate Containment Spray.
- Blocks the actuation signal from the failed transmitter from causing a Phase B containment isolation signal and Main Steam Isolation when bistables are tripped.

Answer: C

Explanation/Justification:

Containment Spray actuation is from two sets of three transmitters.(948 A, B, C and 949 A, B, C). Spray actuation requires 2 transmitters in each SET greater than setpoint to actuate the signal. Finally, containment spray relays must be energized to actuate the signal. Most other features are fail safe de-energize to actuate. Blocking a relay places it in its energized state.

A. Incorrect but plausible because 948A is an input to VC high pressure SI; however, the bistables are de-energize to actuate and bistables are tripped to reduce the coincidence to 1 out of 2.

B. Incorrect but plausible because for all other ESF signals, AOP-INST-1 actions trip one bistable/relay setting the system up such that one more input will cause actuation. For containment spray this failure only affects one SET.

C. Correct.

D. Incorrect but plausible because high containment pressure will actuate Phase B and Main Steam Isolation however, blocking relays does not affect these features.

Technical References: Logic Unit 2 Sheet 12
Syst Desc 10

Proposed References to be provided: None

Learning Objective I2LP-ILO-ESS001 3

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#	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 # 38

Given the following conditions:

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

Subsequently, a reactor trips and a Safety Injection occur. All equipment functioned as designed.

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

- Only 21, 23, and 25 FCUs will be in service. Cooling water flow is maintained by TCV-1103.
- All FCUs will be in service. Cooling water flow is maintained by TCV-1103.
- Only 21, 23, and 25 FCUs will be in service. Cooling water flow is raised by providing a Service Water flowpath by automatically opening TCV-1104 and 1105 Service Water Contmt Recirc valves.
- All FCUs will be in service. Cooling water flow is raised by providing a Service Water flowpath by automatically opening TCV-1104 and 1105 Service Water Contmt Recirc valves.

Answer: D

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

3-E-0

Proposed References to be provided: None

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Question Source: Bank

Question History: Unit 2 NRC 2012

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#	022000A102	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: - Containment pressure	
	Importance	3.6	3.8

Question # 39

Given:

- A steam line rupture occurred inside containment.
- VC pressure peaked at 12 psig.

Which of the following are true for these conditions?

- EOP adverse values are required until an engineering evaluation is satisfactory.
VC pressure will be reduced using the Containment Fan Cooler Units.
- EOP adverse values are required until pressure is < 4psig.
VC pressure will be reduced using Containment Pressure Relief System.
- EOP adverse values are required until an engineering evaluation is satisfactory.
VC pressure will be reduced using Containment Pressure Relief System.
- EOP adverse values are required until pressure is < 4psig.
VC pressure will be reduced using the Containment Fan Cooler Units.

Answer: D

Explanation/Justification:

A. Incorrect but plausible because adverse values are required and when high radiation conditions exist an engineering evaluation is required to use normal values. It is true that pressure will be reduced by the containment fan coolers.

B. Incorrect but plausible because it is correct that adverse values are used if pressure is greater than 4 psig. The pressure relief system is also plausible because there would be no release of radiation from a steam break accident.

C. Incorrect but plausible because adverse values are required and when high radiation conditions exist an engineering evaluation is required to use normal values. The pressure relief system is also plausible because there would be no release of radiation from a steam break accident.

D. Correct

Technical References: OAP-012

Proposed References to be provided: None

Learning Objective I0LP-ILO-EOPROU 7

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#	026000A405	
		Ability to manually operate and/or monitor in the control room: - Containment spray reset switches	
	Importance	3.5	3.5

Question # 40

Given:

- A large break LOCA occurred.
- Containment pressure peaked at 27 psig and started trending down.

Which of the following describes the operation of containment spray reset pushbuttons?

- Containment Spray signal cannot be reset until recirc spray flow indication is > 960 gpm
- Containment Spray signal cannot be reset until directed in ES-1.3 Transfer to Cold Leg recirculation.
- Containment Spray signal can be reset in E-1 when VC pressure is < 17 psig
- Containment Spray signal can be reset in E-0 when VC pressure is < 2 psig

Answer: C

Explanation/Justification:

- A. Incorrect. Plausible because minimum recirc spray is 960; however, this is not verified until after normal spray flow is secured.
- B. Incorrect. Plausible because if not previously reset, containment spray reset is directed in ES-1.3.
- C. Correct.
- D. Incorrect. Plausible because some safeguards signals (e.g., Safety Injection) can be reset regardless of input signal condition.

Technical References: 2-E-1
Proposed References to be provided: None

Learning Objective I2LP-ILO-CS001 6

Question Source: Bank

Question History: Unit 2 NRC 2016

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#	039000A302	
		Ability to monitor automatic operation of the MRSS, including: - Isolation of the MRSS	
	Importance	3.1	3.5

Question # 41

Which of the following signals will close the Main Steam Isolation Valves (MSIVs)?

- A. High Steam Flow coincident with Low Tav_g OR Low Steam Pressure
Manual Phase B Isolation
- B. Steam Line Delta-P
Hi-Hi Containment Pressure
- C. High Steam Flow coincident with Low SG Pressure
High Containment Pressure
- D. High Steam Flow coincident with Low Tav_g OR Low Steam Pressure
Hi-Hi Containment Pressure

Answer: D

Explanation/Justification:

A. Incorrect but plausible because high steam flow with low Tavg or low steam pressure will close the MSIVs, but Manual phase B will not.

B. Incorrect but plausible because Steam Line Delta P will generate an SI signal but not close the MSIVs. The Hi-Hi containment will close the MSIVs.

C. Incorrect but plausible because high steam flow with low SG pressure will close MSIVs but high containment pressure will not (High High pressure will close the MSIVs).

D. Correct.

Technical References: Syst Desc 10

Proposed References to be provided: None

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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#	059000A302	
		Ability to monitor automatic operation of the MFW System, including: - Programmed levels of the S/G	
	Importance	2.9	3.1

Question # 42

Given:

- The reactor is operating at 96% power,
- The controlling steam pressure channel for steam generator 22 fails high,
- NO operator action is taken.

Which ONE of the following describes the effect this transient will have on level control in steam generator 22?

- Level stabilizes above program setpoint, but high-level trip is NOT reached.
- Level initially controls above program setpoint, but returns to setpoint over several minutes.
- Level stabilizes below program setpoint, but lo-lo level trip is NOT reached.
- Level initially controls below program setpoint, but returns to setpoint over several minutes.

Answer: B

Explanation/Justification:

Duplicated from question no 19881

A. Incorrect but plausible because actual level will increase above programmed level, but it will not remain above the programmed level setpoint.

B. Correct

C. Incorrect but plausible because candidate must recall how steam pressure is used in the compensating circuit (direct relationship not inverse).

D. Incorrect but plausible because candidate must recall how steam pressure is used in the compensating circuit (direct relationship not inverse). Also steam generator level will return to programmed level setpoint over time

Technical References: 2-AOP-INST-1

Proposed References to be provided: None

Learning Objective I0SM-LOR-MBFP01 2

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#	2	
	Group#	1	
	K/A#	0590002123	
		Conduct of Operations - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	
	Importance	4.3	4.4

Question # 43

The plant was operating at 30% power during a power ascension with 21 and 22 MBFP operating in AUTO when 21 MBFP trips on low auto stop oil pressure.

When can 21 and 23 AFW pumps be secured and not auto-restart with the switches in auto?

- A. After 21 MBFP Reset Switch is placed in trip.
- B. Any time adequate MFW flow exists.
- C. Any time SG level is greater than 9% in all SGs.
- D. When 21 MBFP auto stop oil pressure returns to > 25 psig.

Answer: A

Explanation/Justification:

This question meets the KA because the procedural action is to place Main Feedwater Pump Trip/Reset switches in Trip to allow normal operation of AFW motor driven pumps.

A. Correct (2-AOP-FW-1 Step 102)

B. Incorrect. Plausible because adequate feed flow would maintain SG level above the auto start setpoint

C. Incorrect. Plausible because 9% is the auto start setpoint; however, SG level will not decrease to 9% before the AFW pumps auto start on MBFP trip.

D. Incorrect. Plausible because 28 psig is the auto stop oil setpoint that will cause the MBFP to trip, so the pump trip cannot be reset at 25 psig.

Technical References: 2-AOP-FW-1

Proposed References to be provided: None

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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#	061000K602	
		Knowledge of the effect of a loss or malfunction of the following will have on the AFW System components: - Pumps	
	Importance	2.6	2.7

Question # 44

Given:

- Reactor tripped from 25% power.
- Bus 6A has an overcurrent lockout.
- No action has been taken by the crew.

Which ONE of the following describes the performance of the Auxiliary Feedwater system for these conditions?

- A. All SGs fed at a total AFW flow of approximately 800 GPM.
- B. All SGs fed at a total AFW flow of approximately 400 GPM.
- C. ONLY Two SGs fed at a total AFW flow of approximately 800 GPM.
- D. ONLY Two SGs fed at a total AFW flow of approximately 400 GPM.

Answer: D

Explanation/Justification:

- A. Incorrect but plausible because this would be correct if both motor drive AFW pump started and delivered flow to the Steam Generators. 23 AFW pump would not start due to loss of bus 6A.
- B. Incorrect but plausible because the 21 motor driven AFW pump will start with a capacity of approximately 400 gpm; however it will only deliver flow to 21 and 22 SGs.
- C. Incorrect but plausible because only 21 and 22 SGs will be fed, but the flowrate is too high.
- D. Correct

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

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Question Source:	Bank
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 5
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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 # 45

Given:

- 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
- 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?

- The steam supply valves to the steam driven AFW pump (1310A and 1310B).
- Reactor power has exceeded the capacity of the AFW system.
- FC-1135A-S, 21 AFW pump suction flow transmitter has failed high.
- PT-406A, 21 AFW Pump Discharge Pressure 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 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 but plausible because "LOW" suction flow will cause the recirculation valve to open which would reduce flow to the SG. Failure high will prevent the recirculation valve from opening if necessary.

D. Correct: Low discharge pressure is indication of pump runout and the controller will close the discharge valves.

Technical References: Syst Desc 21.2

Proposed References to be provided: None

Learning Objective I2LP-ILO-MFW001 13p

Question Source: Bank

Question History: Unit 2 NRC 2012

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 4

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	0620002447	
		Emergency Procedures/Plan - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	
	Importance	4.2	4.2

Question # 46

Given:

- The unit was operating at 100% power
- Severe weather has caused fluctuations in grid voltage.
- 480 V buses are fluctuating between 400 and 418 volts.
- 60 seconds after the event began, the generator tripped.
- 90 seconds later a manual safety injection signal was initiated due to lowering pressurizer level and pressure.

Assuming voltage conditions do not change, which of the following will occur first

- The 480 V bus normal feed breaker will open 9 seconds after the reactor trips.
- The 480 V bus normal feed breaker will open 180 seconds after the reactor trips.
- The 480 V bus normal feed breaker will open 9 seconds after the SI signal is initiated.
- The 480 V bus normal feed breaker will open 180 seconds after the SI signal is initiated.

Answer: C

Explanation/Justification:

A. Incorrect but plausible because the breaker will open 9 seconds after a SI signal due to sustained undervoltage.

B. Incorrect but plausible because with bus voltage below approximately 421 V the normal feed breaker will open after 180 seconds due to sustained undervoltage.

C. Correct. The sustained undervoltage condition starts one of two timers. A 180 second timer starts if no SI signal is present. A 9 second timer starts if a SI signal is present.

D. Incorrect but plausible because the breaker will open 180 seconds after sustained undervoltage condition occurs without an SI signal.

Technical References: 2-ARP-FCF

Proposed References to be provided: None

Learning Objective I2LP-ILO-EDS01 9
I2LP-ILO-EDS01 10

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#	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 # 47

A loss of 125 VDC Power Panel 21 has occurred. How can the operators confirm that Power Panel 21 was lost and that the associated ASCO transfer switches functioned properly?

- A. Breaker indication lights for 6.9KV Buses 5, 1, and 2 are ON.
Control Power Indicating Light for 21 EDG is WHITE.
- B. Breaker indication lights for 6.9KV Buses 5, 1, and 2 are OFF.
Control Power Indicating Light for 21 EDG is AMBER.
- C. Breaker indication lights for 6.9KV Buses 5, 1, and 2 are ON.
Control Power Indicating Light for 21 EDG is AMBER.
- D. Breaker indication lights for 6.9KV Buses 5, 1, and 2 are OFF.
Control Power Indicating Light for 21 EDG is WHITE.

Answer: B

Explanation/Justification:

Explanation:

On a loss of 21 DC PP, the 6.9 KV switchgear will lose power. The ASCO switch will operate to provide alternate control power to 21 EDG as indicated by an amber light.

- a. Incorrect. Plausible because candidate may believe that the ASCO transfer switch provides control power to 6.9 buses; it does not. Control Power indicating light for 21 EDG is incorrect but it is plausible a candidate could confuse the light color.
- b. Correct answer.
- c. Incorrect. Plausible because candidate may believe that the ASCO transfer switch provides control power to 6.9 buses; it does not. Control Power indicating light for 21 EDG is correct.
- d. Incorrect. Plausible because the 6.9 KV breakers will lose control power. Control Power indicating light for 21 EDG is incorrect but it is plausible a candidate could confuse the light color.

Technical References: Syst Desc 27.1
 Syst Desc 27.3

Proposed References to be provided: None

Learning Objective I2LP-ILO-EDS03 3

Question Source: Bank

Question History: Unit 2 NRC 2016

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#	063000K103	
		Knowledge of the physical connections and/or cause-effect relationships between the D.C. Electrical System and the following systems: - Battery charger and battery	
	Importance	2.9	3.5

Question # 48

Which of the following describes the 21 Battery response if Battery Charger 21 is lost with no operator action?

- A. 21 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 2 hours. Battery voltage will continuously lower at a linear rate.
- B. 21 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 2 hours. Battery voltage will lower at a linear rate then drops rapidly.
- C. 21 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 8 hours. Battery voltage will continuously lower at a linear rate.
- D. 21 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 8 hours. Battery voltage will lower at a linear rate then drops rapidly.

Answer: B

Explanation/Justification:

Duplicated from question no 27000 to convert from Unit 3 to Unit 2 question.

A. Incorrect. Plausible because 2 hour rating is correct; however, voltage will not decrease at a linear rate.

B. Correct. The 2 hour rating is TS basis and voltage decreases more rapidly as actual value decreases.

C. Incorrect. Plausible because 8 hour rating is expected if load are reduced and voltage will not decrease at a linear rate.

D. Incorrect. Plausible because 8 hour rating is expected if load are reduced but voltage decrease rate is correct.

Technical References:	Syst Desc 27.5 Tech Specs
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Proposed References to be provided:	None
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Learning Objective	I2LP-ILO-EDS03 11 I2LP-ILO-EDS03 4
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Fundamental Knowledge
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10 CRF Part 55 Content:	55.41 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	064000K102	
		Knowledge of the physical connections and/or cause-effect relationships between the ED/G System and the following systems:	
		- ED/G cooling water system	
	Importance	3.1	3.6

Question # 49

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
Syst Desc 24

Proposed References to be provided: None

Learning Objective I2LP-ILO-EDSEDG 9
I2LP-ILO-SW001 11

Question Source: Bank

Question History: Unit 2 NRC 2012

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#	073000A401	
		Ability to manually operate and/or monitor in the control room: - Effluent release	
	Importance	3.9	3.9

Question # 50

Given the following:

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

What action is required to be taken?

- The Waste Distillate tank will be recirculated until the radiation decays to an acceptable value.
- The Waste Distillate tank will be transferred to the waste concentrates tank for further processing.
- The Waste Distillate tank will be diluted until activity per unit volume reaches acceptable value.
- 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: Unit 2 NRC 2012

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	073000A202	
		Ability to (a) predict the impacts of the following malfunctions or operations on the PRM System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Detector failure	
	Importance	2.7	3.2

Question # 51

Which ONE of the following actions is required if R-44, Unit 2 Plant Vent Gaseous Activity Monitor, becomes inoperable during a release from the Gaseous Waste System?

- A. Continue with the release and monitor the release using R-27, Plant Vent Monitor.
- B. Continue with the release and perform two independent samples once an hour for the duration of the release.
- C. Terminate the release and complete the actions for an inoperable monitor prior to continuing with the release.
- D. Terminate the release; if it is desired to resume the release install a portable continuous air monitor for monitoring the release.

Answer: C

Explanation/Justification:

- A. Incorrect but plausible because R-27 is a plant vent monitor. It will not provide adequate termination for a release of the gas decay tanks.
- B. Incorrect but plausible because SOP 5.4.2, Gas Decay Tank Gaseous Releases states the release must be terminated if any radiation monitor, whose operability was assumed in the preparation of the release permit, becomes inoperable.
- C. Correct Termination of the release and completing the actions for an inoperable monitor prior to continuing with the release is required by SOP 5.4.2.
- D. Incorrect but plausible because termination of the release is required by SOP 5.4.2; however, the procedure does not address the use of a portable air sampler for monitoring the release. Also the portable air monitor could not meet the FSAR requirements for automatic isolation.

Technical References: 2-ARP-SAF-1
2-SOP-12.1
2-SOP-12.2

Proposed References to be provided: None

Learning Objective I2LP-ILO-GWR01 12

Question Source: Bank

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	076000A102	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: - Reactor and turbine building closed cooling water temperatures	
	Importance	2.6	2.6

Question # 52

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?

- Manually trip the unit due to loss of cooling to the Main Boiler Feed Pump Lube Oil Coolers
- Unit Shutdown due to loss of cooling to the Condensate Pump Oil Coolers
- Unit Shutdown due to loss of cooling to the Generator Hydrogen Coolers
- 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: Bank

Question History: Unit 2 NRC 2012

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#	076000K307	
		Knowledge of the effect that a loss or malfunction of the SWS will have on the following: - ESF loads	
	Importance	3.7	3.9

Question # 53

Given:

- The unit is at 100% power.
- Service Water is in 2 header operation
- The NPOs completed valve alignment making Service Water Header 1 2 3 the Essential Header.
- The Mode Selector Switch has the 4 5 6 header selected as Essential
- The plant experienced a unit trip coincident with a loss of 138kV Power.

1. Containment Fan Cooler Units
2. Iso-phase Bus Duct
3. CCW
4. Instrument Air Closed Cooling System
5. EDGs
6. Stator Water Cooling
7. Hydrogen Coolers

Which of the following lists components that will NOT have cooling automatically restored?

- A. 1, 4, 5
- B. 3, 5, 7
- C. 1, 3, 5
- D. 2, 5, 6

Answer: A

Explanation/Justification:

All of the items listed are cooled by either Essential or Non-Essential Service Water. In addition, all of the items can have cooling supplied from either the 1 2 3 header or 4 5 6 header depending on the valve lineup. The Mode Selector Switch determines which pumps automatically start (Essential Service Water Pumps if everything is properly aligned).

A. Correct

B. Incorrect

C. Incorrect

D. Incorrect

Technical References: Syst Desc 24

Proposed References to be provided: None

Learning Objective I2LP-ILO-SW001 4

Question Source: New

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#	078000A401	
		Ability to manually operate and/or monitor in the control room: - Pressure gauges	
	Importance	3.1	3.1

Question # 54

The plant is operating at 100% power with the following indications and alarm SJF (1-5)
 "Instrument Air Low Pressure" just came into alarm.

Based on this, select the choice that best completes the following statement:

"The IA compressors (1) be running and PI-1144 Instrument Air Header pressure would be expected to indicate (2) .

- A. (1) will
(2) 95 psig
- B. (1) will
(2) 90 psig
- C. (1) will not
(2) 95 psig
- D. (1) will not
(2) 90 psig

Answer: B

Explanation/Justification:

Alarm set point is 90# with the IA compressor auto start of 95#. Consequently B is the correct answer. Distracters are combinations of either the wrong pressure (95# vice 90#) or the correct pressure without the compressors running.

Technical References: 2-ARP-SJF

Proposed References to be provided: None

Learning Objective I2LP-ILO-SA01 4

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#	103000A203	
		Ability to (a) predict the impacts of the following malfunctions or operations on the Containment System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Phase A and B isolation	
	Importance	3.5	3.8

Question # 55

The following plant conditions exist on Unit 2:

- Reactor is at 100% RTP
- A manual Phase A isolation signal was inadvertently actuated on Train A.

Which of the following are direct results of the phase A signal and corrective actions required to be taken in response to this event?

	Results	Actions
A.	LCV-459, Letdown Isolation Loop 21, and all orifice isolation valves close	Reset Phase A Restore Instrument Air to VC Place Excess Letdown in service
B.	LCV-459, Letdown Isolation Loop 21 and all orifice isolation valves close	Reset Phase A Restore Instrument Air to VC Place Letdown in service
C.	201, "Letdown Line Normal Path Isolation" and all orifice isolation valves close.	Reset Phase A Restore Instrument Air to VC Place Letdown in service.
D.	201, "Letdown Line Normal Path Isolation" and all orifice isolation valves close.	Reset Phase A Restore Instrument Air to VC Place Excess Letdown in service

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because 459 does not isolate on a Phase A signal. There is no reason to place excess letdown in service if normal letdown is available.

B. Incorrect; Plausible because 459 does not isolate on a Phase A signal. The actions for this distractor are correct.

C. Correct. 201 and all orifice isolation valves do isolate on a Phase A signal. Since normal letdown is available, this would be preferred to excess letdown.

D. Incorrect. Plausible because the Results are correct but the actions are not. There is no reason to place excess letdown in service if normal letdown is available.

Technical References: 2-AOP-CVCS-1
Drawing

Proposed References to be provided: None

Learning Objective I2LP-ILO-CVCS 5

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#	001000K407	
		Knowledge of CRDS design feature(s) and/or interlock(s) which provide for the following: - Rod stops	
	Importance	3.7	3.8

Question # 56

Which of the following malfunctions will cause the Overtemperature ΔT Channel Trip or Rod Stop alarm to annunciate?

- A. PR Channel N41 blown Instrument Power fuse
- B. Loop 22 Thot RTD low
- C. PT-456, PRZR Pressure, fails high
- D. Loop 21 Tcold RTD fails low

Answer: D

Explanation/Justification:

Duplicated from question no 25208 to make Unit 2 question.

A. Incorrect. Plausible because NIS does provide an input to OT delta T; however, the input is from delta flux.

B. Incorrect. Plausible because the candidate must determine how the failure will affect actual delta T and how the calculated setpoint will be affected.

C. Incorrect. Plausible because candidate must recall that Channel 2 (PT-456) cannot be the controlling channel. If a controlling channel failed high, actual pressure would decrease and the alarm would annunciate when the first OT delta T channel setpoint was reached.

D. Correct. This failure causes the indicated delta T to fail high. The alarm will annunciate when the calculated setpoint is less than the indicated delta T.

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

Learning Objective	I2LP-ILO-ICRXP 4
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Question Source:	Modified
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Question History:	Unit 3 NRC 2010
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	011000K603	
		Knowledge of the effect of a loss or malfunction of the following will have on the PZR LCS: - Relationship between PZR level and PZR heater control circuit	
	Importance	2.9	3.3

Question # 57

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

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

Which of the following would cause these indications?

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

Answer: B

Explanation/Justification:

- A. Incorrect. Plausible because this instrument failure would lead to sprays fully open, backup heaters off and a rapid reduction in actual pressure. The failure would also cause BU heaters to de-energize NOT energize.
- B. Correct. The load rejection due to closure of stop valve, results in a heatup and insurge into the pressurizer; heaters will reduce pressure drop on subsequent outsurge.
- C. Incorrect. Plausible because the pressurizer heaters would respond this way if the level channel failed high instead of low.
- D. Incorrect. Plausible because programmed pressurizer level will decrease when T_{avg} decreases as a result of control rod insertion. This will result in decrease pressure and potential heater on. The sprays would not be open.

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

Learning Objective I2LP-ILO-RCSPZR 4
I3LP-ILO-RCSPZR 3

Question Source: Bank

Question History: Unit 3 NRC 2013

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#	017000A101	
		Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ITM System controls including: - Core exit temperature	
	Importance	3.7	3.9

Question # 58

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; however, there is no effect on CET readings.

B Incorrect: Plausible because 3300°F is close to 2300°F and there is no effect on CET readings.

C Correct

D Incorrect: Plausible because there is no effect on CET readings and 3300°F is close to 2300°F

Technical References:	Syst Desc 14
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-ICNXC 4 I2LP-ILO-ICNXC 7
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Question Source:	Modified
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Question History:	Unit 2 NRC 2012
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 2
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	029000A404	
		Ability to manually operate and/or monitor in the control room: - Containment evacuation signal	
	Importance	3.5	3.6

Question # 59

Given:

A Containment Purge is in progress. The following radiation monitors are in service:

- R-41, Vapor Containment Particulate Activity Monitor.
- R-42, Vapor Containment Gas Activity Monitor.
- R-27, Plant Vent Wide Range Gas Monitor.

Which ONE of the below statements describes the affect of a high activity alarm signal?

- R-41/42 in WARN will cause containment evacuation alarm
R-41/42 in ALARM will cause close purge supply and exhaust valves and trip VC purge fan.
- R-27 in WARN will cause containment evacuation alarm.
R-27 in ALARM will cause close purge supply and exhaust valves and trip VC purge fan.
- R-41/42 in WARN will cause containment evacuation alarm
R-27 in ALARM will cause close purge supply and exhaust valves and trip VC purge fan.
- R-27 in WARN will cause containment evacuation alarm.
R-41/42 in ALARM will cause close purge supply and exhaust valves and trip VC purge fan.

Answer: A

Explanation/Justification:

A. Correct

B. Incorrect but plausible because R-27 is used to monitor containment vent, but it will not cause Containment Evacuation alarm.

C. Incorrect but plausible because R-41 will cause containment evacuation alarm at ALERT , but R-27 will not cause Containment Ventilation Isolation.

D. Incorrect but plausible because R-42 will cause containment evacuation alarm at ALERT (Lower than Alarm setpoint) but R-27 will not cause Containment Ventilation Isolation.

Technical References: 2-SOP-5.4.3

Proposed References to be provided: None

Learning Objective I2LP-ILO-RMS001 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#	2	
	Group#	2	
	K/A#	033000K105	
		Knowledge of the physical connections and/or cause-effect relationships between the Spent Fuel Pool Cooling System and the following systems: - RWST	
	Importance	2.7	2.8

Question # 60

Given:

- Spent Fuel Pit Level alarm is annunciated
- SFP transfer gate is reported leaking
- SFP level is 92'-3" as reported by NPO
- SFP boron concentration is 2000 ppm

What methods are used to restore the SFP level?

- Fill the SFP with PW using 723 PW makeup to SFP, then add boron to pool
- Fill the SFP with a Hose connected to PW ensuring end of hose is in SFP to reduce possibility of contamination
- Fill SFP with RWST purification booster pump at maximum rate
- Fill SFP with RWST purification booster pump at 100 gpm

Answer: D

Explanation/Justification:

Tech Spec level SFP >23' above active fuel (92'-2"), boron concentration 2000ppm

A Incorrect, Plausible because Normal make up to the SFP is from valve 723. Adding PW at that amount will reduce SFP boron concentration below TS value

B Incorrect, Plausible because Normal make up to the SFP can be added from a hose connected to a PW supply. Hose is not allowed to be submerged in pool due to siphon concerns. Adding PW at that amount will reduce SFP boron concentration below TS value

C Incorrect, Plausible because fill with RWST purification pump is correct but not a max flow due to channeling of the SFP resin bed

D Correct

Technical References: 2-SOP-4.3.1

Proposed References to be provided: None

Learning Objective I2LP-ILO-SFP001 8

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#	2	
	K/A#	035000K503	
		Knowledge of the operational implications of the following concepts as they apply to the S/GS: - Shrink and swell concept	
	Importance	2.8	3.1

Question # 61

The plant is operating at 100% steady state power when a load limit failure causes a 100 MWe load rejection. Which of the following correctly describes the initial SG level response?

- A. SG level decreases due to shrink effects of the load rejection
- B. SG level increases due to swell effects of the load rejection
- C. SG level decreases due to a mismatch between Steam Flow and Feed Flow
- D. SG level increases due to a mismatch between Steam Flow and Feed Flow

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect but plausible because SG level changes due to shrink effect; however level decreases not increases.

C. Incorrect but plausible because level will decrease, but not due to Steam Flow Feed Flow mismatch.

D. Incorrect but plausible because it would seem that SG level will increase initially when steam flow is lowered before feed flow.

Technical References: Syst Desc 1.1

Proposed References to be provided: None

Learning Objective I2LP-ILO-ICSGL 4

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	041000K202	
		Knowledge of bus power supplies to the following: - ICS inverter breakers	
	Importance	2.8	2.8

Question # 62

21 DC Distribution Panel Circuit 2 breaker tripped resulting in a loss of power to Channel 1 Low Pressure Steam Dump Valves.

Following a unit trip, Channel 1 LP Steam Dump Lockout Relay will be:

- A. tripped and all low pressure steam dump valves will operate as designed
- B. tripped and half of the low pressure steam dump valves will operate as designed
- C. not tripped and all low pressure steam dump valves will operate as designed
- D. not tripped and half of the low pressure steam dump valves will operate as designed

Answer: C

Explanation/Justification:

A. Incorrect but plausible because without power the 86 relay will NOT trip. It is true that all steam dump valves will operate as designed.

B. Incorrect but plausible because without power the 86 relay will NOT trip. It is also plausible to believe that ½ of the LP steam dumps are adequate to prevent an overspeed condition.

C. Correct.

D. Incorrect but plausible because the 86 will not trip without power and it is plausible to believe that ½ of the LP steam dumps are adequate to prevent an overspeed condition

Technical References: Syst Desc 18.1

Proposed References to be provided: None

Learning Objective I2LP-ILO-SDSLP 4

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	045000K301	
		Knowledge of the effect that a loss or malfunction of the MT/G System will have on the following: - Remainder of the plant	
	Importance	2.9	3.2

Question # 63

Given:

- A plant startup is in progress per POP 1.3
- Reactor Power: 15%
- Generator Megawatts: 120 Mwe
- Tavg: 548 °F
- One MBFP in service
- Rod control in manual
- Steam Dump control in automatic PRESSURE mode

Subsequently:

- The turbine tripped.
- All automatic equipment operates properly.

Which of the following describes the status of the plant after actions in 2-AOP-TURB-1 Turbine Trip without Reactor Trip, have been completed?

- SG level control in MANUAL, SG pressure controlled by the condenser steam dumps
- SG level control in MANUAL, SG pressure controlled by the SG atmospheric dump valves
- SG level control in AUTOMATIC, SG pressure controlled by the condenser steam dumps
- SG level control in AUTOMATIC, SG pressure controlled by the SG atmospheric dump valves

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect but plausible because SG level control will be in manual. Candidate may believe Steam Dumps will not control properly following a turbine trip if left in pressure mode.

C. Incorrect but plausible because the main boiler feed pump would remain in operation, but Candidate may believe AFW is in service which controls FLOW in automatic. Also SG pressure would be controlled by the condenser steam dumps.

D. Incorrect but plausible because the main boiler feed pump would remain in operation, but Candidate may believe AFW is in service which controls FLOW in automatic. Candidate may believe Steam Dumps will not control properly following a turbine trip if left in pressure mode.

Technical References: 2-AOP-TURB-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPTUR 3

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#	055000A303	
		Ability to monitor automatic operation of the CARS, including: - Automatic diversion of CARS exhaust	
	Importance	2.5	2.7

Question # 64

Given:

- A Steam Generator Tube Rupture has occurred.
- Reactor Tripped.
- Safety Injection actuated.
- The crew is performing actions of E-0, Reactor Trip or Safety Injection.

Which ONE of the following describes the alignment of the Condenser Air Ejector exhaust?

- Exhaust diverted to Containment on Warn (R-45); Exhaust remains lined up to containment.
- Exhaust diverted to Containment on Alarm (R-45); Exhaust remains lined up to containment.
- Exhaust diverted to Containment on Warn (R-45); Exhaust diverted back to normal on Phase A isolation.
- Exhaust diverted to Containment on Alarm (R-45); Exhaust diverted back to normal on Phase A isolation.

Answer: D

Explanation/Justification:

A Incorrect. Plausible because exhaust does divert to containment; however, it occurs at the Alarm setpoint. Also after a safety Injection, the containment isolation valves close and exhaust returns to normal.

B Incorrect. Plausible because exhaust does divert to containment Alarm setpoint.; however, after a safety Injection, the containment isolation valves close and exhaust returns to normal.

C Incorrect. Plausible because exhaust does divert to containment; however, it occurs at the Alarm setpoint. Also the containment isolation valves close and exhaust returns to normal.

D Correct

Technical References:	Syst Desc 20
Proposed References to be provided:	None

Learning Objective	I2LP-ILO-RMS001 3
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Question Source:	Bank
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Question History:	Unit 2 2016 NRC
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	056000A204	
		Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of condensate pumps	
	Importance	2.6	2.8

Question # 65

The unit was operating at 100% power.
21 Condensate Pump tripped

Which of the following describes the effects of the pump trip and actions to address plant conditions?

- A. A MBFP suction pressure cutback will occur if pressure decreases to less than 265 psig. Reduce turbine load to match steam flow with feed flow; maintain suction pressure > 280 psig.
- B. A main turbine runback will occur if MBFP suction pressure decreases to 265 psig. Maintain suction pressure > 280 psig; remove windup from the Feed Regulating Valves.
- C. A MBFP suction pressure cutback will occur if pressure decreases to less than 230 psig. Take manual control of the Feed Regulating Valves; maintain MBFP suction pressure > 265 psig.
- D. A main turbine runback will occur if MBFP suction pressure decreases to 230 psig. Take manual control of MBFP master controller; reduce speed to maintain suction pressure > 265 psig

Answer: A

Explanation/Justification:

A Correct.

B. Incorrect but plausible because a main turbine runback will occur if a Main Boiler Feed Pump trips. The procedure does direct maintaining suction pressure > 280 psig and removing windup if necessary.

C. Incorrect but plausible because 230 is the pressure at which the low suction cutback signal is the largest. Also taking manual control of the Feed Regulating Valves would reduce the magnitude of the cutback cycles, but it will not address the steam flow feed flow mismatch.

D. Incorrect but plausible because a main turbine runback will occur if a Main Boiler Feed Pump trips. Taking manual control of the MBFP Master controller is directed by the procedure if a cutback occurs; however reducing load is the most important action.

Technical References: 2-AOP-FW-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPFW1 3

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#	3	
	Group#		
	K/A#	1940012113	
		Conduct of Operations - Knowledge of facility requirements for controlling vital / controlled access.	
	Importance	2.5	3.2

Question # 66

Personnel are off-loading the core during a refueling outage with the following conditions:

- An attempt is made to place an irradiated fuel assembly in the upender inside Containment.
- Another irradiated fuel assembly is already in the upender.
- Some damage has occurred to at least one of the assemblies and both are stuck in position.
- 10 industry experts (non-badged visitors) have been briefed by RP in the Training Building and now need to be escorted into Containment to get a close-up view of conditions to provide recommendations.

What is the MINIMUM number of escorts required?

- A. 1
- B. 2
- C. 4
- D. 5

Answer: b

Explanation/Justification:

A. Incorrect but plausible because 1 person can escort up to 10 individual in the Protected Area.

B. Correct

C. Incorrect but plausible because if an individual could escort 3 individuals, this would be correct.

D. Incorrect but plausible because if an individual could escort 2 individuals, this would be correct.

Technical References: EN-NS-232

Proposed References to be provided: None

Learning Objective I0WKBILOADM00 2.1.13

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#	2	
	Group#	2	
	K/A#	1940012127	
		Conduct of Operations - Knowledge of system purpose and or function.	
	Importance	3.9	4

Question # 67

Given:

- The reactor is operating at 100% power
- A shift NPO reports to the Control Room that MOV-205, Charging Line Isolation Valve, has a significant bonnet leak
- The Shift Manager directs the Control Room operators to isolate letdown, secure normal charging and place excess letdown in service

Under these conditions, excess letdown is required in order to:

- Restore VCT Hydrogen-control capability.
- Maintain a constant RCS inventory/pressurizer level.
- Purify reactor coolant by aligning flow through the mixed-bed demineralizers.
- Ensure an adequate cooling water flow rate through the RCP seals while charging is isolated.

Answer: B

Explanation/Justification:

A. Incorrect but plausible because excess letdown is directed to the VCT but not through the spray nozzle to control hydrogen.

B. Correct seal injection is increasing RCS inventory approximately 5 gpm per RCP.

C. Incorrect but plausible because excess letdown is directed to the VCT but not via the mixed bed demins.

D. Incorrect but plausible because the purpose of excess letdown is to maintain seal injection with normal charging isolated.

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

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#	3	
	Group#		
	K/A#	1940012235	
		Equipment Control - Ability to determine	
		Technical Specification Mode of Operation.	
	Importance	3.6	4.5

Question # 68

Given the following conditions:

- A plant startup is in progress
- RCS temperature is 185°
- RCS pressure is 340 psig with a bubble in the pressurizer
- 24 RCP is in service

The Outage Control Center has requested that the 80' air lock be defeated.

The unit is in ____ (1) ____ and the airlock ____ (2) ____

- A. (1) MODE 4
(2) Can be defeated.
- B. (1) MODE 4
(2) Can NOT be defeated.
- C. (1) MODE 5
(2) Can be defeated.
- D. (1) MODE 5
(2) Can NOT be defeated.

Answer: C

Explanation/Justification:

A. Incorrect but plausible because at 340 psig the pressurizer is above 200°F; however, the pressurizer is not part of the RCS for mode considerations.

B. Incorrect but plausible because at 340 psig the pressurizer is above 200°F; however, the pressurizer is not part of the RCS for mode considerations. The candidate may believe that the operation of the RCP will impact the ability to defeat the airlock.

C. Correct.

D. Incorrect but plausible because the unit is in Mode 5 and the candidate may believe that the operation of the RCP will impact the ability to defeat the airlock.

Technical References: Tech Specs

Proposed References to be provided: None

Learning Objective I3LP-ILO-VCVCB 9
I2LP-ILO-VCVCB 9

Question Source: New

Question History: Unit 3 NRC 2018 Retake

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012241	
		Equipment Control - Ability to obtain and interpret station electrical and mechanical drawings.	
	Importance	3.5	3.9

Question # 69

Given partial excerpt from the Chemical and Volume Control flow diagram (9321-F-2736), which of the following describes the significance of broken/dashed lines used for TCV-130?

- A. The valve is included here for information. The actual valve with details appears with solid lines on another drawing.
- B. The valve seat is undercut or valve is mechanically prevented from fully closing. There is always some minimum flow through this flowpath.
- C. Operation of this valve has the potential to cause a change in reactivity.
- D. The interfacing CCW system is classified as a "closed system" for interface LOCA.

Answer: A

Explanation/Justification:

A. Correct. The "ghosted" component indications are used for information and should not be used for tagging purposes because additional detail may exist on another drawing.

B. Incorrect. Plausible because some valve are undercut to prevent thermal locking during heatup and cooldown activities. Also some valve have a minimum/maximum opening or closing mechanical stop.

C. Incorrect. Plausible because TCV-130 has the potential to affect reactivity by causing letdown excessive cooling or heatup.

D. Incorrect. Plausible because the FSAR classifies some systems as Open or Closed. Isolation valves for all fluid system lines penetrating the containment provide at least two barriers against leakage of radioactive fluids to the environment in the event of a loss-of-coolant accident. These barriers, in the form of isolation valves or closed systems, are defined on an individual line basis.

Technical References:

Proposed References to be provided: None

Learning Objective I0LP-ILO-BOT001 2

Question Source: Bank

Question History: Unit 2 NRC 2010

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012307	
		Radiological Controls - Ability to comply with radiation work permit requirements during normal and abnormal conditions.	
	Importance	3.5	3.6

Question # 70

You have been directed to perform 2-PT-Q028A, 21 Residual Heat Removal Pump Test.
The following area dose rates exist:

- Maximum area dose 7 mr/hr
- Average area dose 3 mr/hr
- Low Dose Area 0.2 mr/hr

Using the attached RWP determine:

- (1) Accumulated dose at which you must stop work and exit RCA
 - (2) Dose Rate Actions
- A. (1) 10 mrem
(2) Exit the area
 - B. (1) 10 mrem
(2) Move to low dose area
 - C. (1) 8 mrem
(2) Exit the area
 - D. (1) 8 mrem
(2) Move to low dose area

Answer: C

Explanation/Justification:

A. Incorrect but plausible because the RWP states the dose alarm is 10 mrem; however the Stop Work section of the RWP states 80% of the ED dose set point. Also Exiting the area is correct for a dose rate alarm.

B. Incorrect but plausible for the same reason above. Candidate may believe that moving to a low dose area is acceptable if accumulated dose is below limit.

C. Correct

D. Incorrect but plausible because dose is correct, but the candidate may believe that moving to a low dose area is acceptable if accumulated dose is below limit.

Technical References: EN-RP-105

Proposed References to be provided: None

Learning Objective

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 12

Comments

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

Question # 71

Given the following:

- A Steam Generator Tube Rupture has occurred on 22 SG
- The crew has performed all actions of E-3, Steam Generator Tube Rupture, up to the step for commencing a depressurization of the RCS
- All equipment is functioning as designed.

Which one of the following describes the status of 22 SG Atmospheric and the reason for the status?

- CLOSED with controller in Manual; to prevent radioactive release to atmosphere
- CLOSED with controller in Manual; ensures minimum RCS subcooling will be maintained when RCS depressurization is initiated.
- Set at 1030 with controller in AUTO; prevent uncontrolled radioactive release due to SG safety valve lifting.
- Set at 1030 with controller in AUTO; ensures minimum RCS subcooling will be maintained when RCS depressurization is initiated

Answer: C

Explanation/Justification:

A. Incorrect but plausible because it is desirable for the valve to be closed; however the controller is not in manual.

B. Incorrect but plausible because opening the atmospheric relief is not desired and it would impact subcooling; however, the valve is left in automatic.

C. Correct.

D. Incorrect but plausible because the controller is set to 1030 and left in automatic, but while maintaining subcooling is desirable, it is not the reason.

Technical References: 2-E-3

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE30 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#	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 # 72

Given the following conditions:

- 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?

- Fuel movement through the fuel transfer canal is increasing the general area radiation levels.
- Additional irradiated fuel in the containment is increasing the general area radiation levels.
- Staging of waste bags near the containment airlock is increasing the general area radiation levels.
- 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 4

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 12

Comments

Question #73 contains potentially sensitive information and is filed separately as a non-public document.

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

Question # 74

Given:

- A Site Area Emergency has been declared.
- Emergency Response Facilities have been declared Operational
- An OFF-SHIFT NPO contacts the Control Room

Which of the following identifies where you would direct the NPO to report?

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

Answer: B

Explanation/Justification:

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

B. Correct.

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

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

Technical References: IP-EP-210

Proposed References to be provided: None

Learning Objective I0LP-ILO-ERT001 1

Question Source: New

Question History: Unit 3 NRC 2017

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#	1940012449 Emergency Procedures/Plan - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	
	Importance	4.6	4.4

Question # 75

Given the following:

Small break LOCA mitigation is in progress in accordance with E-1 "Loss of Reactor or Secondary Coolant".

RHR pumps have been secured in accordance with Step 13 of that procedure.

Containment pressure is 3 psig.

WHICH ONE (1) of the following would require the manual start of the RHR pumps?

- A. RCS pressure is 300 psig.
- B. RCS subcooling margin is 10°F
- C. PZR level cannot be maintained above 4%.
- D. Transfer to Post LOCA Cooldown and Depressurization desired.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect but plausible because this does satisfy one of the safety injection reinitiation criteria.

C. Incorrect but plausible because this does satisfy one of the safety injection reinitiation criteria

D. Incorrect but plausible because RHR flow < 240 gpm is a criterion for transition to ES-1.2 Post LOCA Cooldown and Depressurization

Technical References: 2-E-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE10 3
I2LP-ILO-EOPE10 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#		1
	Group#		1
	K/A#	0000152120	
		Conduct of Operations - Ability to interpret and execute procedure steps.	
	Importance	4.6	4.6

Question # 76

Given:

- Reactor Power is 100%
- 23 RCP Seal Return Flow is >6 gpm
- 23 RCP Shaft Vibration is 16 mils and increasing @ 2 mil/hr
- 23 RCP #1 Seal Inlet Temperature is 120°F and stable
- 23 RCP Seal Return Temperature is 135°F and stable
- 23 RCP Stator Winding Temperature is 175°F and stable

The following annunciators are in alarm:

- 23 RCP HIGH VIBRATION
- 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 23 RCP indications?

- A. Trip the reactor, Trip 23 RCP, Initiate E-0, Reactor Trip or Safety Injection, Close 261C 23 RCP Seal Return Valve and 455B RCP 23 Spray Valve.
- B. Trip the reactor, Trip 23 RCP, Close 455B RCP 23 Spray Valve, Go to E-0, Reactor Trip or Safety Injection.
- C. Initiate POP-2,1 (Operation At Greater Than 45% Power) and POP 3.1 (Plant Shutdown From 45% Power), Trip 23 RCP within 8 hours.
- D. Initiate POP-2.1 (Operation At Greater Than 45% Power) and POP 3.1 (Plant Shutdown From 45% Power). 23 RCP Operation can continue.

Answer: A

Explanation/Justification:

A Correct.

B. Incorrect but plausible because the Reactor and RCP should be tripped; however the sequence is not correct (Go To E-0 vs Initiate E-0) and the seal return valve must be closed.

C. Incorrect but plausible because a normal shutdown would be performed if seal return flow is > 5 but < 6 gpm, but it does not direct securing the RCP.

D. Incorrect but plausible because a normal shutdown would be performed if seal return flow is > 5 but < 6 gpm, it does not direct securing 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: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	0000262119	
		Conduct of Operations - Ability to use plant computers to evaluate system or component status	
	Importance	3.9	3.8

Question # 77

Given:

- Unit is at 40% Power
- CCW Surge Tank level was lowering

Subsequently:

- NPO initiated makeup to CCW Surge Tank
- CCW Surge Tank Level is currently stable
- VC Sump level is increasing
- RCP BRG TEMP HIGH alarm is annunciated.
- PICS indicates 21 RCP Motor Bearing Temperature is 185°F
- 30 minutes later, 21 RCP Motor Bearing Temperature is 186°F
- 22 – 24 RCP Motor Bearing Temperatures approximately 107°F and stable

Which of the following describes the actions for these conditions?

- Trip the reactor
Trip all RCPs
- Trip the reactor
Trip 21 RCP
- Perform a 4 hour shutdown per POP-3.1 Plant Shutdown from 45%
Trip all RCPs
- Perform a 4 hour shutdown per POP-3.1 Plant Shutdown from 45%
Trip 21 RCP

Answer: D

Explanation/Justification:

This question meets the KA because RCP bearing temperature is only indicated on the plant computer (PICS) system.

A. Incorrect but plausible because the leak can be isolated by closing CCW supply and Return valves. That would isolate all CCW to the RCPs which would require tripping all RCPs.

B. Incorrect but plausible because only 21 RCP is affected, but a reactor trip is not required per AOP-RCP-1 until either CCW is lost for > 5 minutes or 200°F motor bearing temperature.

C. Incorrect but plausible because a plant shutdown is the correct action per AOP-RCP-1, and the basis for the shutdown in the AOP is an 8 hour shutdown. With temperature rising at 3°F/hr 200°F will be exceeded in approximately 4.3 hours.

D. Correct. AOP RCP actions for loss of cooling to the RCPs directs a shutdown with the goal of securing the RCP before 200°F.

Technical References: 2-AOP-CCW-1
2-AOP-RCP-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOPCCW 3
I2LP-ILO-AOPRCP 3

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#		1
	K/A#	000056A245	
		Ability to determine and interpret the following as they apply to the Loss of Offsite Power: - Indicators to assess status of ESF breakers (tripped/not-tripped) and validity of alarms (false/not-false)	
	Importance	3.6	3.9

Question # 78

Unit is operating at 100% power
A loss of 138KV off site power occurs.

5 minutes later:

- 480V Lockout lights are energized for all 480V safeguards buses
- 480V Bus 5A indicates 0 Volts
- 52-5A, 480V Bus 5A Normal Feed breaker, position indicating lights are extinguished
- 52-SS5 Sta Serv Xfmr 5 supply breaker, position indicating green light is illuminated
- The following alarms are annunciating:
 - 6900 V Station Service XFMR Breaker Trip (Common) Panel SHF
 - 6900 V Station Aux Breaker Trip 52ST5 52ST6 Panel SHF

Which of the following describes the plant conditions, Sustained UV Safeguard Bus Trip alarm status, and actions to restore power to bus 5A?

- A. 52-5A Breaker is Closed; Alarm is annunciated
Open 5A normal Feed Breaker and Close 21 EDG output breakers in accordance with 2-AOP-138KV-1.
- B. 52-5A Breaker is Closed; Alarm is clear
Open 5A normal Feed Breaker and Close 21 EDG output breakers in accordance with 2-AOP-480V-1.
- C. 52-5A Breaker is Open; Alarm is annunciated
Close 21 EDG output breakers in accordance with 2-AOP-138KV-1.
- D. 52-5A Breaker is Open; Alarm is clear
Close 21 EDG output breakers in accordance with 2-AOP-480V-1.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect but plausible because the bus 5A normal feed breaker is closed; however 2-AOP-480V-1 is not the correct procedure to re-energize the bus.

C. Incorrect but plausible because the bus is de-energized which would support the breaker being open; however, the Station Service Transformer Supply breaker is open preventing the bus from being energized. Also, it is physically possible to simply close the normal supply breaker to re-energize the bus, but the procedure directs opening the normal supply breaker first.

D. Incorrect but plausible because the bus is de-energized which would support the breaker being open; however, the Station Service Transformer Supply breaker is open preventing the bus from being energized. Also, it is physically possible to simply close the normal supply breaker to re-energize the bus, but the procedure is incorrect

Technical References: 2-AOP-138KV-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-EDS01 4

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#		1
	K/A#	000062A204	
		Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: - The normal values and upper limits for the temperatures of the components cooled by SWS	
	Importance	2.5	2.9

Question # 79

Given:

- River Water temperature is 90°
- 1-2-3 is selected as the Essential Service Water Header
- Service Water is in 2 header operations
- 21 and 23 Service Water Pumps are operating
- Containment Temperature is 124° and rising at 2°F/hr

Subsequently:

- 22 Service water pump was started and tripped
- The SM declared 22 SW Pump inoperable
- Containment Temperature is 132°F and rising

Which of the following is the required action for the above plant conditions?

- A. The crew must immediately enter LCO 3.0.3.
- B. Be in Mode 3 in 7 hours.
- C. The crew has 8 hours to restore containment temperature.
- D. The crew has 8 hours to swap Service Water Headers if not complete then enter LCO 3.0.3.

Answer: C

Explanation/Justification:

At IPEC unit 2 Service Water Headers are arranged by supply pump, 21, 22, 23 and 24, 25, 26. Depending on physical valve lineup either header can supply essential or non essential loads. While swapping which header is supplying essential/nonessential loads, both systems are inoperable, but this condition is allowed by TS via a NOTE.

A. Incorrect but plausible because multiple Tech Spec LCOs are entered, but the actions are addressed independently. LCO 3.0.3 does not apply.

B. Incorrect but plausible because this is the action for Ultimate Heat Sink high temperature. UHS high temperature is less than or equal to 95°F

C. Correct.

D. Incorrect but plausible because TS 3.7.8 for Service Water System does allow 8 hours to swap headers from non essential to essential without entering LCO 3.0.3.

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

Learning Objective	I2LP-ILO-VCVCB 10
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 2
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	000065A206	
		Ability to determine and interpret the following as they apply to the Loss of Instrument Air: - When to trip reactor if instrument air pressure is decreasing	
	Importance	3.6	4.2

Question # 80

Given:

- Unit 2 is operating at 15% power when an Instrument Air malfunction occurs.
- The crew enters 2-AOP-AIR-1, Air Systems Malfunction.
- Instrument air header pressure is 75 psig and lowering slowly.
- Letdown isolated
- VCT level lowers to 4%.
- LCV-112B, RWST to Charging Pump Suction LCV, failed to open.

Which of the following describes how the CRS should proceed?

- Direct a reactor trip, stop all RCPs, then initiate E-0, Reactor Trip or Safety Injection while continuing in 2-AOP-AIR-1.
- Direct a reactor trip and initiate E-0, Reactor Trip or Safety Injection, to stabilize the plant, then transition back to 2-AOP-AIR-1 to address the loss of instrument air when transition out of E-0.
- Dispatch NPO to OPEN 288 Manual Suction Stop to Charging Pump, minimize charging pump speed, place excess letdown in service to maintain PRZR level.
- Dispatch NPO to OPEN SA-33 SA Unit 3 Tie Stop Valve, Stop running Charging Pump, start manual makeup to restore VCT level.

Answer: A

Explanation/Justification:

A is correct because when VCT level lowers <5%, a reactor trip is directed per AOP-AIR-1 steps 4.12-4.15, which includes reactor trip, stopping RCPs, stopping charging pumps, and isolating letdown (already isolated in stem), then initiating E-0.

B is incorrect but plausible as it directs a reactor trip, but the AOP is performed in parallel with EOPs to restore air regardless of transition.

C is incorrect but plausible because opening 288 is directed when VCT level is less than 8.5, but the reactor is tripped if level decreases to less than 5%. Also, minimizing charging and placing excess letdown in service would help with rising pressurizer level.

D is incorrect but plausible because the candidate may believe opening SA-33 would help restore air pressure. But this valve is closed in this procedure. Stopping the running charging pump is consistent with low VCT level, however it is not directed in the AOP.

Technical References: 2-AOP-AIR-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-SA01 9

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#		1
	K/A#	0000772401	
		Emergency Procedures/Plan - Knowledge of EOP entry conditions and immediate action steps.	
	Importance	4.6	4.8

Question # 81

Given:

- The plant was operating at 30% power during a plant startup.
- Grid disturbance has caused the Main Generator to trip on over frequency.

Which of the following describe the electric plant conditions and required actions?

- A. All 480V buses are energized from the EDGs
Restore off-site power using AOP-138KV-1
- B. All 480V buses are energized from the EDGs
Restore off-site power using AOP-480V-1
- C. 480V buses 5A and 6A are energized
480V buses 2A and 3A de-energized.
Restore 480V buses using AOP-480V-1
- D. 480V buses 5A and 6A are energized
480V buses 2A and 3A de-energized.
Restore 480V buses using AOP-138KV-1

Answer: C

Explanation/Justification:

Over frequency causes a generator trip and lockout of 6.9 buses 1-4 (they will not fast transfer to offsite power due to frequency mismatch). Buses 5 and 6 are not affected by the generator trip. The reactor trips due to turbine trip.

E-0 step 3 is the immediate operator action that checks for 480V bus alignment. Buses 5A and 6A remain energized from offsite power. Buses 2A and 3A will not be energized. The RNO for step 3 directs re-energizing 6.9 KV buses 2 and 3 and 480 V buses 2A and 3A using AOP-480V-1.

A. Incorrect but plausible because grid over frequency locks out only the 1-4 6.9 KV buses from fast transfer to offsite power buses 5 and 6. Candidate may believe that all 6.9 buses de-energize. If all 6.9KV buses were de-energized the 480V buses would be energized from the EDGs. If all 480V buses are energized the RNO for re-energizing buses is not implemented.

B. Incorrect but plausible because grid over frequency locks out only the 1-4 6.9 KV buses from fast transfer to offsite power buses 5 and 6. Candidate may believe that all 6.9 buses de-energize. If all 6.9KV buses were de-energized the 480V buses would be energized from the EDGs. If all 480V buses are energized the RNO for re-energizing buses is not implemented

C. Correct. 480V buses 2A and 3A will be de-energized. E-0 step 3 RNO is implemented and AOP-480V is the correct procedure to use to re-energize buses.

D. Incorrect but plausible because the bus alignments are correct; however, AOP-138KV will not address losses of only buses 1-4.

Technical References: 2-E-0

Proposed References to be provided: None

Learning Objective I2LP-ILO-EDS01 9

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#	000036A202	
		Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: - Occurrence of a fuel handling incident	
	Importance	3.4	4.1

Question # 82

Given the following conditions:

- Refueling Operations are in progress, Full Core Off-Load is being performed.
- A spent fuel assembly has been latched in the manipulator mast and the assembly has just been lifted clear of the reactor vessel flange.
- Visual Observations indicate Refueling Cavity and Spent Fuel Pool Level are both lowering.
- The local indication in the Refueling Cavity is at 91'

Which of the following describe the correct initial procedural actions based on the above information?

- Immediately suspend movement of all irradiated fuel assemblies in accordance with Technical Specifications 3.7.14 and 3.9.6, evacuate all personnel from Containment, initiate Containment Ventilation Isolation (Purge & Pressure Relief Valves Closed), close the fuel transfer canal gate valve and initiate level makeup.
- Place the suspended fuel assembly in the containment upender, lower and send to the Fuel Storage Building, then close the fuel transfer canal gate valve, and evacuate all personnel from the Fuel Storage Building (FSB) and Containment VC).
- Close the fuel transfer canal gate valve, place the suspended fuel assembly back in the reactor vessel and evacuate non-essential personnel from the Fuel Storage Building (FSB) and Containment (VC).
- Place the suspended fuel assembly in the containment upender in the vertical position, evacuate non-essential personnel from the Fuel Storage Building (FSB) and Containment (VC), close the fuel transfer canal gate valve and initiate level makeup.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the student may be focused on the need to immediately suspend movement of irradiated fuel assemblies per the tech spec actions, however, as stated in the tech spec bases; "this does not preclude movement of a fuel assembly to a safe position." Also plausible because if the assembly is left in the manipulator crane mast with level continuing to lower, actions from the "damaged" fuel assembly section requiring Containment Ventilation Isolation and evacuation are very plausible. The need to makeup is also a subsequent step and therefore additionally plausible.

B. Incorrect. Plausible because depending on how fast level is lowering, the upender would be a second choice per the procedure (See Attachment 2, step 2.5), however, the upender would never be sent back to the FSB. Transfer cart needs to be on containment side to facilitate gate valve closure. The remaining steps are correct, except that all personnel are not evacuated, only "non-essential". Plausible because, all personnel are evacuated for a "damaged" assembly.

C. Correct. See steps 4.27 – 4.30 in body of procedure, Attachments 1 & 2.

D. Incorrect. Plausible because depending on how fast level is lowering, the upender would be a second choice per the procedure (See Attachment 2, step 2.5), however, the upender would be then lowered to the "horizontal" position. Closing the gate valve is correct and the need to makeup is also a subsequent step and therefore additionally plausible.

Technical References: 2-AOP-FH-1
3-AOP-FH-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-AOPFH1 2
I3LP-ILO-AOPFH1 5
I2LP-ILO-FHD001 8

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#		1
	Group#		2
	K/A#	0000692236	
		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 # 83

Given:

- The plant is in MODE 3.
- Personnel airlock interlock mechanism is declared inoperable at 0200.
- Personnel airlock outer door is closed and locked at 0245.

Which of the following describes the TS requirements necessary to permit access to perform repairs on the inoperable interlock mechanism?

- Place the plant in Mode 4 prior to entry.
- Lock the inner door and post a dedicated individual to perform the interlock function prior to entry.
- Lock the inner door and prohibit any entry until after repairs are made.
- Restore Containment to Operable status within 4 hours or Be in Mode 4 in 6 hours..

Answer: B

Explanation/Justification:

A. Incorrect but plausible because this is the action if both door are inoperable and one cannot be closed.

B. Correct

C. Incorrect Note 1 to TS 3.6.2 ACTIONS does not prohibit opening of the inner door. The Bases of TS 3.6.2 acknowledges that the containment boundary may not be intact for a short time.

D. Incorrect The air locks have their own TS for inoperability.

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

Learning Objective	I2LP-ILO-VCVCB 4
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Question Source:	Bank
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Question History:	DC Cook 2014
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 2
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	00WE02A202	
		Ability to determine and interpret the following as they apply to the SI Termination: - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
	Importance	3.5	4

Question # 84

The crew just completed resetting Phase A and B at step 10 in ECA-2.1, Uncontrolled Depressurization of All Steam Generators.

The ATC reports the following SG conditions.

SG	Level	Pressure
SG 21	20% WR	360 psig STABLE
SG 22	19% WR	320 psig DECREASING
SG 23	18% WR	310 psig DECREASING
SG 24	26% WR	380 psig INCREASING

E-2, Faulted Steam Generator Isolation

E-1, Loss of Reactor or Secondary Coolant

Which one of the following actions is correct?

- A. Immediately transition to E-2; a subsequent transition to E-1 will terminate SI with MORE restrictive criteria.
- B. Immediately transition to E-2; a subsequent transition to E-1 will terminate SI using the Foldout Page criteria.
- C. Complete SI Termination in ECA-2.1 then cooldown and place RHR in service per ECA-2.1.

- D. Complete SI Termination in ECA-2.1 then Transition to E-2, a subsequent transition to E-1 will evaluate plant conditons.

Answer: D

Explanation/Justification:

A. Incorrect but plausible because, if the conditions occurred before the crew initiated SI termination actions at step 9 then a transition to E-2 is correct. Also termination criteria in E-1 includes Heat Sink thus MORE restrictive.

B. Incorrect but plausible because, if the conditions occurred before the crew initiated SI termination actions at step 9 then a transition to E-2 is correct. Also termination criteria in E-1 includes termination criteria on the Foldout Page.

C. Incorrect but plausible because ECA-2.1 foldout page directs completing SI Termination (steps 9 – 17) if it has been started then transition to E-2. Also ECA-2.1 does provide actions to cooldown to RHR if a transition out does not occur.

D. Correct. Per the Foldout Page directs “go to E-2” if you are not performing steps 9-17. E-1 will evaluate all plant conditions to identify any additional failures.

Technical References: 2-ECA-2.1

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPC21 4

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#	00WE132435	
		Emergency Procedures/Plan - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	
	Importance	3.8	4

Question # 85

Given:

- The plant experienced an inadvertent SI.
- 21 SG Pressure is 1130 psig and stable.
- Attempts to dump steam from 21 SG have been ineffective from Control Room.
- The team is in FR-H.2, Response to Steam Generator Overpressure.
- RCS Hot Leg Temperatures are 510°F and stable.
- All MSIVs are closed

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

- Feed 21 SG with cold AFW.
- Trip 21 RCP.
- Locally dump steam from 21 SG using Atmospheric
- Cooldown RCS using 22, 23, 24 Atmospherics

Answer: C

Explanation/Justification:

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

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

C. Correct.

D. Incorrect. The procedure directs a cooldown with the other SG if Thot is $> 520^{\circ}$

Technical References: 2-FR-H.2

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFRH 4

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#		2
	Group#		1
	K/A#	0060002445	
		Emergency Procedures/Plan - Ability to prioritize and interpret the significance of each annunciator or alarm.	
	Importance	4.1	4.3

Question # 86

Given:

- A small break LOCA occurred.
- 23 SI Pump failed to automatically start
- The crew performed the actions of E-0 and transitioned to E-1.
- 21 SI Pump started and immediately tripped on overcurrent.

The during the transition brief, the BOP reported that the following alarms were annunciated:

- SAFEGUARDS EQUIPMENT LOCKED OPEN
- SAFEGUARDS VALVE OFF NORMAL POSITION.

Which of the following describes why the alarms are annunciating and what actions are required?

- The SAFEGUARDS EQUIPMENT LOCKED OPEN is expected due to placing the RHR pump in TPO during performance of E-0.
The SAFEGUARDS VALVE OFF NORMAL POSITION is expected due to automatic repositioning of 851A/851B.
851A or 851B must be opened to restore SI Flow to the RCS.
- The SAFEGUARDS EQUIPMENT LOCKED OPEN is expected due to placing the RHR pump in TPO during performance of E-0.
The SAFEGUARDS VALVE OFF NORMAL POSITION is not expected.
Determine which valve has failed and reposition it to its safeguards position.
- The SAFEGUARDS EQUIPMENT LOCKED OPEN is expected due to overcurrent trip of 21 SI Pump.
The SAFEGUARDS VALVE OFF NORMAL POSITION is not expected.
Determine which valve has failed and reposition it to its safeguards position.

D. The SAFEGUARDS EQUIPMENT LOCKED OPEN is expected due to overcurrent trip of 21 SI Pump.

The SAFEGUARDS VALVE OFF NORMAL POSITION is expected due to automatic repositioning of 851A/851B.

851A or 851B must be opened to restore SI Flow to the RCS.

Answer: A

Explanation/Justification:

For a Safety Injection with no complications neither alarm is expected until RHR pump is placed in Trip Pull Out per E-0. The Valve Off Normal alarm is not expected unless a problem exists. Failure of both 21 and 23 SIP will cause both 851A and 851B (discharge valves for 22 SIP. The SIP will not deliver flow to the core until one of the valves is opened and de-energized.

A. Correct. The Safeguards Equipment alarm will annunciate when RHR pump is placed in TPO in E-0 to address strong pump weak pump condition. The trip of either 21 or 23 SIP will reposition 851A or 851B causing the alarm.

B. Incorrect but plausible because the Safeguards Equipment alarm is correct, The Valve Off Normal alarm is expected due to repositioning 851A/B.

C. Incorrect but plausible because Safeguards Equipment alarm is expected but not for the reason given. Valve off normal alarm is expected for the conditions given.

D. Incorrect but plausible because Safeguards Equipment alarm is expected but not for the reason given. The Valve Off Normal alarm and response is correct.

Technical References: 2-E-0

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPE00 4

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#	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 # 87

Given:

- 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.
- All other components satisfied surveillance acceptance criteria.

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

(1) The faulty bistable provides a ____ (1) ____ input.

(2) The ____ (2) ____ must be removed/tripped.

(1)

(2)

- | | | |
|----|------------------|----------|
| A. | non conservative | channel |
| B. | conservative | bistable |
| C. | non conservative | bistable |
| D. | conservative | channel |

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because the setpoint is non-conservative (allowable value is 2416 in TS); however, removing the entire channel because of the failure of one bistable is not conservative.

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 bistable must be placed in the tripped condition to satisfy TS. It is not necessary to remove the entire channel.

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. Also, removing the entire channel because of the failure of one bistable is not conservative.

Technical References: Tech Specs

Proposed References to be provided: None

Learning Objective IOLP-ILO-ITS001 3

Question Source: New

Question History: Unit 2 NRC 2012

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		
	Group#		1
	K/A#	039000A203	
		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: - Indications and alarms for main steam and area radiation monitors (during SGTR)	
	Importance	3.4	3.7

Question # 88

Given:

- The unit was at 100% power.
- A SGTR occurred in 24 SG.
- The crew manually tripped the reactor and actuated SI
- The crew is currently performing the initial cooldown in E-3
- During the cooldown the BOP reports that level in 21 SG is increasing in an uncontrolled manner.

Which of the following identifies the indications to confirm a second tube rupture in 21 SG and what actions are required?

R-61A, 21 Main Steam N-16 Monitor

R-28, 21 Main Steam Line Monitor

- A. R-61A increasing
R-28 increasing
Stabilize the plant and return to E-3 step 1
Isolate 21 SG
Resume cooldown to target temperature based on 24 SG pressure.
- B. R-28 only increasing
Stop cooldown in progress
Close MSIV for 21 SG
Resume cooldown to target temperature based on 24 SG pressure.

- C. R-61A increasing
R-28 increasing
Stop cooldown in progress
Close MSIV for 21 SG
Initiate cooldown to target temperature based on 21 SG pressure.

- D. R-28 only increasing
Stabilize the plant and return to E-3 step 1
Isolate 21 SG
Initiate cooldown to target temperature based on 21 SG pressure.

Answer: D

Explanation/Justification:

R-61A is main steam line monitor for N-16 gammas. After shutdown it will not indicate. R-28 is the main steam line monitor 21 SG. It will increase when 21 SGTR occurs. E-3 Foldout page directs actions for Multiple Tube Ruptures. Essentially, the procedure is restarted as if first tube rupture did not occur.

A. Incorrect but plausible because R28 will increase but R-61C is N-16 monitor and it will not increase. The cooldown is not resumed but initiated based on 21 SG pressure.

B. Incorrect but plausible because R-28 only will increase, but full isolation of 21 SG is required. The procedure does state that "isolation of Ruptured SG(s) should be completed by closing the MSIV(s).

C. Incorrect but plausible R-28 will increase, but R-61A will not. Initiating a cooldown base in 21 SG pressure is correct.

D. Correct.

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

Learning Objective	I2LP-ILO-EOPE30 4
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 5
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	062000A212 Ability to (a) predict the impacts of the following malfunctions or operations on the A.C. Distribution System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Restoration of power to a system with a fault on it	
	Importance	3.2	3.6

Question # 89

Unit 2 is at 100% power when 480V Bus 5A normal feed breaker trips on overcurrent.

- 1) What is the status of the breakers on 480V bus 5A?
 - 2) How will power will be restored to Bus 5A in accordance with 2-AOP-480V-1, Loss of Normal Power to Any 480V bus?
- A.
 - 1) All breakers on Bus 5A will be open EXCEPT for MCC-26A, and MCC29/29A
 - 2) Place all Load Breakers in Trip Pull Out
Re-energize the bus from the Station Service Transformer (Normal Feed)
 - B.
 - 1) All breakers on Bus 5A will be open EXCEPT for MCC-26A
 - 2) Place all Load Breakers in Trip Pull Out
Re-energize the bus from the Emergency Diesel Generator (Emergency Feed)
 - C.
 - 1) All breakers on Bus 5A will be open EXCEPT for MCC-26A, and MCC29/29A
 - 2) Place Non-Safeguards Breakers in Trip Pull Out
Re-energize the bus from the Emergency Diesel Generator (Emergency Feed)
 - D.
 - 1) All breakers on Bus 5A will be open EXCEPT for MCC-26A
 - 2) Place Non-Safeguards Breakers in Trip Pull Out
Re-energize the bus from the Station Service Transformer (Normal Feed)

Answer: B

Explanation/Justification:

A. Incorrect but plausible because the breaker for MCC 26A will not trip on undervoltage. The breaker for MCC 29/29A will trip not trip on a Safety Injection Signal, but it will trip on an undervoltage condition. All load breakers are placed in TPO. The bus is re-energized EDG not the normal supply.

B. Correct. because the breaker for MCC 26A will not trip on undervoltage. The breaker for MCC 29/29A will trip not trip on a Safety Injection Signal, but it will trip on an undervoltage condition.. All load breakers are placed in TOP and the bus is re-energized from the EDG.

C. Incorrect but plausible because the breaker for MCC 26A will not trip on undervoltage. The breaker for MCC 29/29A will trip not trip on a Safety Injection Signal, but it will trip on an undervoltage condition. Leaving Safeguards breakers in normal would allow an auto start if necessary, but it is NOT desired. Also the bus would be re-energized from the EDG.

D. Incorrect but plausible because the breaker for MCC 26A will not trip on undervoltage and the breaker for all other MCCs will trip. The bus is re-energized EDG not the normal supply.

Technical References: 2-AOP-480V-1

Proposed References to be provided: None

Learning Objective I2LP-ILO-AOP480 2

Question Source: Bank

Question History: Unit 3 NRC 2010

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#	1030002244	
		Equipment Control - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	
	Importance	4.2	4.4

Question # 90

A small break LOCA occurred.

Complications with the SI system resulted in no SI flow to core.

Core Exit TCs indicate 800°F and lowering slowly

RVLIS indicates 32%

The crew is performing actions of FR-C.1, Response to Inadequate Core Cooling.

The ATC reports VC High Range Radiation Monitors R-25 indicates 70 R/hr and R-26 indicates 62 R/hr.

Which of the following describes the E-Plan classification and basis?

- A. Site Area Emergency; Activate ERO to Normal facility location
R-25 and R-26 must both exceed 68 R/hr thus there is no challenge to Containment Fission Product Barrier
- B. Site Area Emergency; Activate ERO to Alternate facility location
R-25 > 68 R/Hr indicates 20% loss of Fuel Cladding Fission Product Barrier
- C. General Emergency; Activate ERO to Alternate facility location
R-25 > 68 R/hr combined with assumed VC leakage will result in exceeding Protective Action Guidelines at site boundary.
- D. General Emergency; Activate ERO to Normal facility location
R-25 > 68 R/hr could have severe consequences, if released, regardless of whether containment is challenged.

Answer: D

Explanation/Justification:

R-25 and R-26 are used in both Fuel Matrix fission product barrier Loss/Potential Loss and Containment fission product barrier Loss/Potential Loss tables. R-25/26 are used to indicate fuel damage. When the value of R-25 or R-26 exceeds 68 R/hr the potential consequences if a release occurred are such that a GE is required.

A. Incorrect but plausible because exceeding 68 R/hr is a Potential Loss indicator, but only one indicator is required not both. SAE would typically be correct for only 2 Fission Product Barriers.

B. Incorrect but plausible because R-25/26 are used to indicate Fuel Cladding barrier Loss/Potential Loss but they are also used for Containment Loss/Potential Loss. SAE would typically be correct for only 2 Fission Product Barriers.

C. Incorrect but plausible because a General Emergency is the correct classification, but the basis is not correct.

D. Correct.

Technical References: IP-EP-AD13

Proposed References to be provided: None

Learning Objective IOLP-ILO-ERT002 1.05

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#		2
	K/A#	034000A201 Ability to (a) predict the impacts of the following malfunctions or operations on the Fuel Handling System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Dropped fuel element	
	Importance	3.6	4.4

Question # 91

You are notified by the Fuel Handling Supervisor that an irradiated fuel assembly was dropped in the spent fuel pool. The assembly fell into the correct pool location. R-5 and R-44 readings are increasing. R-5 is in ALARM.

Based on these conditions, what actions are required after suspending fuel handling operations in the FSB by AOP-FH-1, Fuel Damage or Loss of SFP/Refueling Cavity Level?

- A. Evacuate ONLY non-essential personnel from the FSB, place FSB ventilation in service and monitor R-44.
- B. Evacuate ONLY non-essential personnel from the FSB, ensure SFP purification is in service with maximum flow and monitor R-44.
- C. Evacuate ALL personnel from the FSB, ensure ALL FSB doors are closed and monitor R-44.
- D. Evacuate ALL personnel from the FSB, ensure SFP purification is in service with maximum flow and monitor R-44.

Answer: C

Explanation/Justification:

A. Incorrect but plausible. All personnel are evacuated and the procedure does not direct placing ventilation in service. However only evacuating non-essential personnel and placing ventilation in service are plausible.

B. Incorrect but plausible. Maximizing purification is plausible, but not in the procedure.

C. Correct answer per AOP-FH-1

D. Incorrect but plausible. Plausible for same reason as B.

Technical References: 2-AOP-FH-1
3-AOP-FH-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-FHD001 8
I2LP-ILO-FHD001 8

Question Source: Bank

Question History: Unit 3 NRC 2013

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

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

Question # 92

Given:

- A release of 14 Waste Distillate Storage Tank (WDST) was in progress
- R-54, Unit 1 Liquid Waste Distillate Monitor, was in service.

Subsequently:

- During the release R-54 lost power,
- the NPO reports that the breaker tripped for R-54
- The release is still in progress.

What is the course of action to resume the release?

- Stop running waste distillate transfer pump
Obtain 2 independent samples of 14 WDST
Validate release permit
Reset the breaker for R-54
The release can resume if sample is unchanged.
- Stop running waste distillate transfer pump and close discharge valves
Reset the breaker for R-54
Obtain 2 independent samples of 14 WDST
Determine actual volume released from 14 WDST
Validate release permit
- Stop running waste distillate transfer pump and close discharge valves
Declare R-54 inoperable
Obtain 2 independent samples of 14 WDST

Obtain 2 independent verifications of new release permit calculations
Obtain 2 independent verifications of the discharge valve lineup

- D. Stop running waste distillate transfer pump
Declare R-54 inoperable
Obtain 2 independent verifications of new release permit calculations
Obtain 2 independent verifications of the discharge valve lineup
Install portable radiation monitor

Answer: C

Explanation/Justification:

A. Incorrect but plausible because stopping the pump is part of terminating release but it does not include closing valves. Obtaining 2 independent samples is also correct and the procedure is correct.

B. Incorrect but plausible because stopping the pump and closing the valves is correct to terminate the leak. 2 independent samples are required but a new release permit is required. Also the procedure is incorrect.

C. Correct.

D. Incorrect but plausible because stopping the pump will stop the release, but it does not include closing valves. Portable monitors are not used for liquid releases. Also the procedure is not correct.

This question satisfies the KA because the candidate must predict the impact of a loss of power to the rad monitor. The release should terminate on a loss of power and thus the operator must take manual actions to satisfy the requirement. That is the second part of the KA.

Technical References:	2-ARP-SAF-1 ODCM
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-RMS001 4
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#		2
	K/A#	0710002238	
		Equipment Control - Knowledge of conditions and limitations in the facility license.	
	Importance	3.6	4.5

Question # 93

Given:

- RCS Activity increased and the crew entered 2-AOP-HIACT-1.
- The crew is stripping fission gasses per 2-SOP-8.1, Reactor Coolant System Chemistry Control.
- During the degas operation, R-50, Gas Decay Tank Activity exceeded the Alarm setpoint.

Which of the following states the ODCM basis for R-50 alarm and required actions?

R-50 Alarm indicates:

- In-service Waste Gas Tank combined activity has exceeded 29,761 μCi
Swap in-service Waste Gas Decay Tanks to clear R-50 alarm
- Waste Gas Tank combined activity has exceeded 29,761 μCi
Immediately suspend addition of radioactive material to the Gas Decay Tanks
- In-service Waste Gas Decay Tank has exceeded 6,000 μCi
Swap in-service Waste Gas Decay Tanks to clear R-50 alarm
- Waste Gas Tank combined activity has exceeded 6,000 μCi
Immediately suspend addition of radioactive material to the Gas Decay Tanks

Answer: C

Explanation/Justification:

A. Incorrect but plausible because 29,761 is the Currie limit for all gas decay tank (equivalent Xe-133 not combined), however, R-50 is based on one tank (6,000 Ci). Also the action is correct per ODCM if 29,761 Ci limit is exceeded.

B. Incorrect but plausible because 29,761 is the equivalent Xe-133 limit for all GasDeca Tanks; however, R-50 is based on one tank (6,000 Ci). Also the action is correct per ODCM if 29,761 Ci limit is exceeded.

C. Correct. If the in-service tank exceeds 6,000 equivalent Xe-133, R-50 will alarm and the action per the ARP is to swap tanks.

D. Incorrect but plausible because R-50 is based on exceeding 6,000 Ci but not combined Kr and Xe. The action to swap tanks is also correct.

Technical References: 2-ARP-SAF-1
ODCM

Proposed References to be provided: None

Learning Objective I2LP-ILO-GWR01 10
I2LP-ILO-GWR01 9

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#		3
	Group#		
	K/A#	1940012141	
		Conduct of Operations - Knowledge of the refueling process.	
	Importance	2.8	3.7

Question # 94

Given:

- The unit is in MODE 6 performing core reload

In accordance with 2-REF-003-GEN Section 3.1, Fuel Movement Requirements – Core Reload,

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

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

Answer: A

Explanation/Justification:

Duplicated from question no 26811 to make Unit 2 Question
This question was Question 95 on the 2015 McGuire NRC Exam

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

A. Correct answer.

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

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

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

Technical References:

Proposed References to be provided: None

Learning Objective I2LP-ILO-FHD001 8

Question Source: Bank

Question History: McGuire 2015

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012213	
		Equipment Control - Knowledge of tagging and clearance procedures.	
	Importance	4.1	4.3

Question # 95

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

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

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

Answer: D

Explanation/Justification:

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

- A. Incorrect but plausible if the candidate is not sufficiently familiar with the work order/tagout process.
- B. Incorrect but plausible since the procedure could allow the FSS to approve the form.
- C. Incorrect but plausible if the candidate is not sufficiently familiar with the work order/tagout process.
- D. Correct answer.

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

Learning Objective I0LP-ILO-ADM01 1

Question Source: Bank

Question History: Unit 3 NRC 2017

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 5

Comments

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

Question # 96

The plant is at 100% power.

- 0830 on December 3, the 21 RHR pump is declared inoperable.
- 2300 on December 5, the 23 HHSI pump is declared inoperable.
- 0215 on December 6, the 21 RHR pump is restored to OPERABLE status.

Given a copy of TS section 3.5.2 and 1.3, including any extensions that are permitted by TS, which one of the following describes the LATEST time and date to restore the 23 HHSI pump to OPERABLE status without requiring a unit shutdown?

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

Answer: B

Explanation/Justification:

Duplicated from question no 26823

Include TS Section 3.5.2

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

The original inoperability of 21 RHR pump required return to operability by 0830 on 12/6 (choice A).

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

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

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

B. Correct answer.

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

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

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

Learning Objective	I2LP-ILO-RHR001 9
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Question Source:	Bank
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Question History:	N/A
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.43 (b) 2
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Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012311	
		Radiological Controls - Ability to control radiation releases.	
	Importance	3.8	4.3

Question # 97

Given:

- The unit was operating at 100% power
- A 150 gpm SGTR occurred on 22 SG
- All SG levels are off scale low on narrow range indication
- 21 AFW pump tripped on overcurrent
- 23 AFW pump is running
- The operating crew performed all required actions.

Which of the following statements describes the actions related to 22 AFW pump?

22 AFW pump will:

- remain running feeding 21 SG to prevent a dry out condition. An NPO will be dispatched to isolate steam supply from 22 SG.
- be tripped to minimize the radioactive release. Pump can be restarted after steam supply from 22 SG is isolated
- remain running feeding 21 and 22 SGs to establish level in 22 SG. An NPO will be dispatched to isolate steam supply from 22 SG.
- be tripped to prevent excessive cooldown of 22 SG. Pump can be restarted only if necessary for RCS cooldown.

Answer: B

Explanation/Justification:

For this condition 22 AFW pump was started and used to feed 21 and 22 SG. 21 SG level increasing is indication that this was done. In E-3 22 AFW pump is tripped if one motor driven pump is running and the tube rupture is in 22 or 23 SG. When steam supply to 22 AFW pump is isolated from the ruptured SG the pump is restarted.

A. Incorrect but plausible because 21 SG is below 10%, but the pump will be tripped to minimize radiation release. An NPO will be sent to isolate the steam supply from 22 SG to 22 AFW pump to allow restart of the pump.

B. Correct.

C. Incorrect but plausible because adequate level in 22 SG is necessary to perform the cooldown in E-3. An NPO will be dispatched to isolate steam supply from 22 SG after the pump is tripped. The pump can then be restarted

D. Incorrect but plausible because the pump is tripped, but not to prevent excessive cooldown. Additionally, the pump is operated if it is the only AFW pump running and steam supply to the pump from 22 SG is isolated.

Technical References: 2-E-3

Proposed References to be provided: None

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I2LP-ILO-MFW001 15
I2LP-ILO-MFW001 6

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments

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

Question # 98

Given:

- Unit 2 is at 1% Reactor power coming out of a refueling outage.
- Personnel in containment are accompanied by an RP tech with monitoring equipment.
- Personnel are in containment making adjustments to 23 RCP vibration probes.
- The CRS and SM want to raise power to 2%.

Based on 0-SOP-CB-001, Containment Entry and Egress, what is required regarding this power ascension?

- Entry party for the work on the RCP vibration probes will have leave Containment. When the power increase is complete RP supervision determines when workers can return to the RCP.
- Power can be raised since RP tech is continuously monitoring radiation levels; the power ascension does not require additional action per 0-SOP-CB-001.
- Power can be raised. However, since there are personnel in the inner crane wall, 0-SOP-CB-001 requires the SM to specifically approve the power ascension.
- RP Supervision and entry party shall be notified prior to any planned change in power level. The RP Supervisor shall decide if workers need to exit or move to ALARA area prior to raising power is necessary.

Answer: D

Explanation/Justification:

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

A. Incorrect but plausible. It is not unreasonable that 0-SOP-CB-001 would have required removing personnel prior to power ascension, not just moving to outer crane wall.

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

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

D. Correct based 0-SOP-CB-001 step 2.24.1

Technical References: 0-SOP-CB-001

Proposed References to be provided: None

Learning Objective I0LP-ILO-ADM01 4

Question Source: Bank

Question History: Unit 2 NRC 2010

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012408	
		Emergency Procedures/Plan - Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	
	Importance	3.8	4.5

Question # 99

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?

- 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
- 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
- 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
- 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: Unit 2 NRC 2012

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#	1940012430 Emergency Procedures/Plan - Knowledge of which events related to system operations/status that must be reported to internal organizations or external agencies, such as State, the NRC, or the transmission system operator.	
	Importance	2.7	4.1

Question # 100

Unit 2 Initial Conditions:

- Reactor Power = 100%

Unit 2 Current Conditions:

- E-0, Reactor Trip or Safety Injection has been initiated
- 21 RCP seal failure exists and the pump has been secured
- RCS leakage is 200 gpm
- CETs = 550°F
- Containment pressure = 15 psi
- Subcooled margin = 50°F
- 1 RCP is operating
- RVLIS dynamic head range = 30%

Based on the current conditions, which one of the following correctly states: (1) the EAL classification required to be made by the shift manager

and

(2) the maximum time for notification of the NRC after the declaration is made?

- (1) Alert
(2) 15 minutes
- (1) Alert
(2) 1 hour
- (1) Site Area Emergency
(2) 15 minutes

- D. (1) Site Area Emergency
(2) 1 hour

Answer: B

Explanation/Justification:

A. Incorrect but plausible because the alert classification is correct with only one fission product barrier compromised. 15 minutes is plausible because that is the time to complete notifications to the state and counties after declaration,

B. Correct.

C. Incorrect but plausible because candidate may believe that RVLIS indicates a challenge to fuel clad. Fuel clad potential loss combined with RCS loss would be classified as a SAE. 15 minutes is plausible because that is the time to complete notifications to the state and counties after declaration.

D. Incorrect but plausible because candidate may believe that RVLIS indicates a challenge to fuel clad. Fuel clad potential loss combined with RCS loss would be classified as a SAE. The 1 hour notification is correct.

Technical References: IP-EP-120
Steam Tables

Proposed References to be provided: None

Learning Objective IO LP-ILO-ERT002 1.08

Question Source: Bank

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments