Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000007K102 Knowledge of the operational implications of the following concepts as they apply to the reactor trip: - Shutdown margin	
	Importance	3.4	3.8

Question # 1

Given the following conditions:

- A reactor trip without SI has occurred.
- The reactor trip and bypass breakers are open and neutron flux is decreasing.
- All rod bottom lights are on except D-4 and M-8.
- Rod D-4 indicates 25 steps and M-8 indicates 230 in IRPI.
- RCS temperature has decreased to 530°F.

Which of the following describes the operator actions per 3-ES-0.1, Reactor Trip Response to satisfy shutdown margin?

Emergency boration is required for:

A. RCS temperature ONLY.

B. Multiple stuck rods ONLY

C. RCS temperature with any stuck rod ONLY.

D. RCS temperature with any stuck rod AND multiple stuck rods.

Answer: D

Explanation/Justification:

ONOP-CVCS-3 addresses 3 separate post trip conditions that require emergency boration:

- Temperature less than 500°F
- Temperature less than 540°F with any stuck control rods
- More than one control rod stuck.

For the question, two separate conditions exist, temperature less than 540° with any rods stuck AND more than ONE rod stuck. The procedure first emergency borates for the low temp with any rod stuck then (and separately) for the multiple stuck rods.

A. Incorrect. Plausible because temperature is below expected 547° but the temperature for emergency boration is 500°.

B. Incorrect. Plausible because with 2 stuck rods emergency boration is required; however, it is also required for the temperature condition with any stuck rods.

C. Incorrect. Plausible because candidate must remember that a rod greater than 25 steps is considered stuck thus 2 rods requiring more boration.

D. Correct.

Technical References:	3-ES-0.1 3-ONOP-CVCS-3
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPS10 5
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000009K102 Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: - Use of steam tables	
	Importance	3.5	4.2

Question # 2

Given the following conditions:

- A LOCA occurred while at 100% power.
- A fault occurred on bus 6A.
- Containment Temperature is 172°F.
- The crew is performing ES-1.2, Post-LOCA Cooldown and Depressurization.
- RCS pressure is1335 psig and stable.
- Two Charging Pumps are running.
- 34 RCP is running.
- The crew is evaluating stopping 1 SI Pump.

Which of the following is the MAXIMUM RCS CET temperature that will allow stopping 1 SI Pump in accordance with ES-1.2?

A. 347°F

B. 447°F

C. 467°F

D. 530°F

Answer: C

Explanation/Justification:

Duplicated from question no 24407
A. Incorrect. Plausible because this value would be correct if containment conditions were adverse.

B. Incorrect. Plausible because this would be correct for adverse containment with 3 SIPs running

C. Correct. 1350 psia is 582°F saturated conditions

D. Incorrect . Plausible because this would be correct for 3 SIPs running with 2 charging pumps and normal containment values.

Technical References:	3-ES-1.2
Proposed References to be provided:	3-ES-1.2 Flow Reduction Table
Learning Objective	I3LP-ILO-EOPS10 3
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000011K313 Knowledge of the reasons for the following responses as they apply to the Large Break LOCA: - Hot-leg injection/recirculation	
	Importance	3.8	4.2

Question # 3

When responding to a LBLOCA, which of the following choices identifies:

(1) The <u>maximum</u> time allowed from event initiation to the completion of the transfer to Hot Leg recirculation
(2) Why the transfer to Hot Leg recirculation is performed?

A. (1) 4 hours
(2) Terminate boiling in the core and prevent boron precipitation in the core.

B. (1) 6.5 hours
(2) Terminate boiling in the core and prevent boron precipitation in the core.

C. (1) 4 hours
(2) To ensure boron concentration adequate for shutdown margin during cooldown.

D. (1) 6.5 hours
(2) To ensure boron concentration adequate for shutdown margin during cooldown.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because the transfer must begin at greater than or equal to 4 hours. The reason is correct.

B. Correct.

C. Incorrect. Plausible because the transfer must begin at greater than or equal to 4 hours. The reason is also plausible because boron is the concern, however flushing is not.

D. Incorrect. Plausible because the transfer time is correct. The reason is plausible because boron is the concern, however flushing is not the issue.

Technical References:	3-ES-1.3 Background
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPS10 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000015A208 Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions: - When to secure RCPs on high bearing temperature	
	Importance	3.4	3.5

Question # 4

Which of the following contains two independent conditions, BOTH OF WHICH <u>always</u> require an immediate trip of the affected reactor coolant pump (RCP)?

A. (1) Seal return temperature of 230 degrees F.
(2) 10 mils RCP shaft vibration.

B. (1) #1 seal return flow less than 0.84 gpm.
(2) RCP motor stator winding temperature of 245 degrees F.

C. (1) High oil level alarm in upper motor bearing reservoir.
(2) Seal injection temperature of 205 degrees F.

D. (1) Lower motor bearing temperature of 210 degrees F.
(2) #1 seal differential pressure (Δp) of 195 psid.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because seal temperature is elevated (greater than the trip limit for seal inlet temperature but below criteria for seal outlet temperature. Vibration value is above frame limit but below shaft limit.

B. Incorrect. Plausible because seal return flow less than .84 is trip criteria if seal temperatures are increasing. Also, motor stator temperatures are elevated, but not greater than trip setpoint.

C. Incorrect. Plausible because oil level will cause alarm and is addressed in the AOP; however there is no trip criteria for oil level. Seal injection temperature is well above normal, but it is not at the trip criteria setpoint of 225°F.

D. Correct.

Technical References:	3-AOP-RCP-001
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPRCP 2
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000022A204 Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: - How long PZR level can be maintained within limits	
	Importance	2.9	3.8

Question # 5

Given the following condition:

- The unit was operating at 100% power.

Subsequently:

- HCV-142, Charging Line Flow Control Valve, failed shut.
- The CRS entered 3-AOP-CVCS-1, Chemical and Volume Control System Malfunctions.
- The crew isolated letdown.
- The crew lowered charging flow per to 6 gpm seal injection per RCP.
- Seal return flow is 3 gpm per RCP.
- No other operator actions were performed.
- Pressurizer level is 49% and rising slowly.

Which of the following identifies:

(1) How long until a Tech Spec shutdown will be required due to Pressurizer level
(2) The required time line for performing that shutdown

A. (1) 30 minutes.
(2) Immediately initiate actions to be in MODE 3 within 6 hours.

B. (1) 60 minutes.
(2) Immediately initiate actions to be in MODE 3 within 6 hours.

C. (1) 60 minutes.
(2) If level is not restored within the next hour, initiate a shutdown to MODE 3 within 6 hours.

D. (1) 30 minutes.
(2) If level is not restored within the next hour, initiate a shutdown to MODE 3 within 6 hours.

Answer: A

Explanation/Justification:

Seal injection reduced to minimum would be 6 gpm per pump. Design seal return would be 3 gpm per pump. This would create 12 gpm net increase in RCS inventory.
An accepted thumb rule for gallons/% in the Pressurizer is 75 when hot.
0-SOP-LEAKRATE-001 uses 62.6 gallons/% in the Pressurizer when hot
Either way it will approximately 30 minutes to go from 49% to 54.3%.
For a cold pressurizer 125 gallons/% is used or 126.6 gallons/% from SOP.
For cold conditions it would take approximately 55 minutes to reach 54.3%+

A. Correct.

B. Incorrect. Plausible because time would be correct if 126 gallons/% was used and the action is correct.

C. Incorrect. Plausible because the time would be correct if 126 gallons/% was used.

D. Incorrect. Plausible because the time is correct, but the TS action is not.

Technical References:	0-SOP-LEAKRATE-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RCSPZR 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000025A102 Ability to operate and/or monitor the following as they apply to the Loss of Residual Heat Removal System: - RCS inventory	
	Importance	3.8	3.9

Question # 6

Given the following conditions:

- The unit is in MODE 6.
- Reactor cavity is being pumped to the RWST via 883, RHR Pumps Discharge Return to RWST Isolation.
- 32 RHR Pump and Heat Exchanger are in service.

Subsequently:

- A large leak developed on the inlet to MOV-731, RHR Loop Suction Isolation.
- RCS level is 61'6" and slowly lowering.
- In accordance with AOP-RHR-1, Loss of RHR, the RHR pump was secured when flow started to oscillate.

Which of the following describes the expected core cooling flowpath per AOP-RHR-1?

A. Restore RCS inventory > 66' using SI Pump from RWST.

B. Start Containment Spray Pump to refill the refueling cavity from the RWST.

C. Initiate Makeup to RCS using Charging from RWST; when Recirculation sump level >48'2", Open 1802A or B and start a recirculation pump.

D. Restore RCS inventory> 66' using Charging from RWST, when Containment sump level > 48'2", Open 885A or B, Containment Sump RHR Suction Isolation and start an RHR pump.

Answer: C

Explanation/Justification:

A. Incorrect. The SIP could restore level from the RWST. This would provide core cooling, but level restoration >66' is incorrect.

B. Incorrect. Plausible because Containment Spray is the normal means of filling the Refueling cavity via spool piece and fire hose. This would cool the core; but it is not directed in AOP-RHR-1.

C. Correct. The contents of the RWST is transferred to containment and when level is adequate, a Recirculation Pump is started.

D. Incorrect. Plausible because the flow path directed by AOP-RHR-1 is similar to this. The RWST is transferred to containment, but the Recirculation Pumps are used not the RHR pumps.

Technical References:	3-AOP-RHR-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPRHR 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 9

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	0000262120 Conduct of Operations - Ability to interpret and execute procedure steps.	
	Importance	4.6	4.6

Question # 7

Given the following conditions:

- A reactor trip has occurred.
- CCW Surge Tank level is lowering slowly.
- The leak is in the common supply line to the Charging Pumps and must be isolated.

Which one of the following describes the required action when CCW is isolated to the Charging Pumps?

A. Stop the running Charging Pump, stop all RCPs.

B. Stop the running Charging Pump, verify adequate RCP seal leakoff.

C. Place the running Charging Pump in minimum speed until backup cooling water is aligned.

D. Place the running Charging Pump in maximum speed until backup cooling water is aligned.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because stopping the running charging pump would reduce heat on CCW. If CCW was also lost to the RCPs , they would need to be tripped.

B. Incorrect. Plausible because stopping the running charging pump would reduce heat on CCW. As long as CCW existed to thee RCPs operation could continue; however, this is not procedurally driven nor is it desirable.

C. Incorrect. Plausible because running charging pump at minimum speed may seem to create the lowest heat load, but it does not.

D. Correct

Technical References:	2-AOP-CCW-1 3-AOP-CCW-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPCCW 3
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000027K203 Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: - Controllers and positioners	
	Importance	2.6	2.8

Question # 8

Given the following conditions:

- 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.

A. Both PORVs will open automatically when required.

B. Only PORV PCV-456 will open automatically when required.

C. Only PORV PCV-455C will open automatically when required.

D. 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.

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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:	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#	000029K206 Knowledge of the interrelations between the ATWS and the following: - Breakers, relays, and disconnects	
	Importance	2.9	3.1

Question # 9

Given the following conditions:

- A unit startup is in progress.
- Reactor Power is 8%.

Subsequently:

- A Loss of 32 DC Power Panel occurs.
- The ATC reports reactor power remains at 8% and stable.

Which of the following describes whether or not an ATWS has occurred, and why or why not?

An ATWS ___(1)___ occurred because ___(2)___ .

A. (1) has
(2) the shunt trip coil should have opened Reactor Trip Breaker A

B. (1) has
(2) the undervoltage coil should have opened Reactor Trip Breaker A

C. (1) has NOT
(2) control power is lost but no trip signal is present

D. (1) has NOT
(2) the undervoltage coil is energized from an independent source

Answer: B

Explanation/Justification:

Drawing 113E301 Sheet 11
A. Incorrect. Plausible because an ATWS has occurred; however, there is no control power to the trip coil.

B. Correct. An ATWS has occurred. Control power to the breaker is lost, and the undervoltage coil is supplied by 32 Distribution Panel; however 32 Distribution panel is supplied from 32 Power Panel. Loss of power to the undervoltage coil should have tripped the breaker.

C. Incorrect. Plausible because control power was lost and no valid trip signal exists, but the undervoltage coil is de-energized.

D. Incorrect. Plausible because the undervoltage coil is power from 32 Distribution Panel not 32 Power panel; however, 32 Power Panel supplies DC power to 32 Distribution Panel

Technical References:	113E301 Sh 11
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICRXP 3 I3LP-ILO-ICRXP 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#	1	
	K/A#	000038K102 Knowledge of the operational implications of the following concepts as they apply to the SGTR: - Leak rate vs. pressure drop	
	Importance	3.2	3.5

Question # 10

Given the following conditions:

- The unit is operating at 100% power when R-15 (condenser off gas) alarms.
- The crew enters 3-AOP-SG-1, Steam Generator Tube Leak.
- As the crew performs AOP-SG-1, Chemistry reports that 31 SG has experienced a step change in SGTL from 0 to 76 gpm.
- The CRS orders a power reduction to commence.

Assuming the physical size of the tube defect remains the same, which of the following describes how the SGTL rate will be affected, if at all, during the downpower, and how will the SGTL rate affect the downpower being performed?

The affected SG tube leakage will ___(1)___ as power is lowered, and the power reduction ___(2)___ .

A. (1) lower
(2) must continue

B. (1) remain stable
(2) must continue

C. (1) lower
(2) may be terminated if leakage lowers <75 gpd steady state.

D. (1) remain stable
(2) may be terminated when power is < 50%.

Answer: A

Explanation/Justification:

With the physical size of the defect saying the same, and as SG pressure rises during the downpower, the leak rate must lower. Historically if the leakrate was reduced to less than 75 gpd, the power reduction could be suspended. This is no longer true.

A. Correct. The leakrate will decrease with the power reduction, but once commenced the power reduction must continue per AOP. There is no direction to stop the shutdown.

B. Incorrect. SG pressure rises as power is reduced.

C. Incorrect. Plausible because regardless of leakrate the shutdown to mode 3 must continue.

D. Incorrect. The power reduction will not be terminated, the power reduction to <50% must be performed in < 1 hour, then MODE 3 must be achieved within the next 6 hours. The power reduction is not terminated it is modified to achieve MODE 3 in required time.

Technical References:	3-AOP-SG-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPSG1 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000055K302 Knowledge of the reasons for the following responses as they apply to the Station Blackout: - Actions contained in EOP for loss of offsite and onsite power	
	Importance	4.3	4.6

Question # 11

The crew is preparing to commence SG depressurization in ECA-0.0, LOSS OF ALL AC POWER.

Which of the following describes the cooldown rate AND the basis for the depressurization?

Depressurize.....

A. at maximum rate which allows exceeding a cooldown rate of 100°F/Hr to enhance AFW flow.

B. at a rate not to exceed a cooldown rate of 100°F/Hr to minimize RCS inventory loss.

C. at maximum rate which allows exceeding cooldown rate of 100°F/Hr to maintain the ability to continue reflux boiling heat removal.

D. at a rate not to exceed a cooldown rate of 100°F/Hr to prevent having to enter 3-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because some procedures allow a cooldown rate that exceeds 100°/hr; however, ECA-0.0 is NOT one of them and the reason is not to enhance AFW flow.

B. Correct.

C. Incorrect. Plausible because some procedures allow a cooldown rate that exceeds 100°/hr; however, ECA-0.0 is NOT one of them and reflux boiling is not the reason.

D. Incorrect. Plausible because not exceeding 100°F/hr is correct; however, not challenging Thermal Shock is not the reason.

Technical References:	2-ECA-0.0 3-ECA-0.0 3-ECA-0.0 Background
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPC00 1 I3LP-ILO-EOPC00 5
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#	1	
	K/A#	000057A219 Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: - The plant automatic actions that will occur on the loss of a vital ac electrical instrument bus	
	Importance	4	4.3

Question # 12

Given the following conditions:

- Unit 3 is at 100% power.
- "A" Steam Flow and Feed Flow are in control.
- PZR pressure channel 1 is in control and 2 is in alarm positions.
- PZR level channel 2 is in control and 1 is in alarm positions.
- ALL systems are in their normal full power lineup.

Subsequently, a loss of 31 Instrument Bus occurs.

Which of the following describes the plant response with no operator actions?

A. Letdown isolates, ALL PRZR heaters de-energize, 31 and 34 Main Feed Reg valves go open.

B. Letdown isolates, ALL PRZR heaters de-energize, ALL four Main Feed Reg valves will maintain program level.

C. Letdown remains in service, ALL PRZR heaters remain in their initial condition, 31 and 34 Main Feed Reg valves go closed.

D. Letdown remains in service, ALL PRZR heaters remain in their initial condition, ALL four Main Feed Reg valves remain at their initial position.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because Letdown does isolate, all PRZR heaters do Deenergize, 31 and 34 "C" level channels fail low; however they cannot be the controlling channel.

B. Correct.

C. Incorrect. Plausible because if 34 instrument bus fails Letdown will remain in service and PRZR heaters remain in their initial condition. 31 and 34 "C" level channels fail low; however they cannot be the controlling channel.

D. Incorrect. Plausible because if 34 instrument bus fails Letdown will remain in service and PRZR heaters remain in their initial condition. Also all 4 FRVs will remain in their initial position.

Technical References:	3-AOP-IB-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPIB1 3
Question Source:	Bank
Question History:	Unit 3 NRC 2006
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#	000058A103 Ability to operate and/or monitor the following as they apply to the Loss of DC Power: - Vital and battery bus components	
	Importance	3.1	3.3

Question # 13

Given the following conditions:

- Unit 3 is operating at 100% power.
- The control room receives BATTERY CHARGER TROUBLE alarm on CCR Panel SHF.
- The NPO reports that the alarm is for 34 Battery Charger failure.

How is/was the annunciator made available to alarm on any other battery charger alarm condition?

A. Opening the 34 Battery Charger output breaker.

B. Acknowledging the alarm with the CCR Acknowledge pushbutton.

C. Pressing the Alarm Acknowledge pushbutton on the 34Battery Charger Panel.

D. Taking the Normal/Bypass Switch on the 34 Battery Charger Panel to BYPASS.

Answer: D

Explanation/Justification:

A is incorrect but plausible if the candidate thinks opening the output breaker would clear the alarm, but parameters monitored are upstream of the output breaker.

B is incorrect but plausible if the operator thinks there is reflash capability for the alarm.

C is incorrect but plausible if the operator thinks that locally acknowledging the alarm will remove the input into the CCR alarm.
This question is a KA match based on being able to monitor battery bus components (battery chargers) by knowing how alarms on those components will be monitored in the CCR.

D is correct because 31-36 battery chargers alarms feed into a single CCR Battery Charger Trouble Alarm. 3-ARP-011, page 75 identifies how to clear alarm by taking affected charger normal bypass switch to bypass.

Technical References:	3-AOP-DC-1 3-ARP-011
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDS125 9
Question Source:	Bank
Question History:	2017 NRC Exam
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#	000062K302 Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: - The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	
	Importance	3.6	3.9

Question # 14

Given the following conditions:

- The unit is operating at 100% power.
- The Service Water Pump Mode switch is selected to 4, 5, 6.
- 32, 33, and 36 Service Water Pumps are in operation.

Subsequently, an inadvertent SI signal is actuated during testing.

Which of the following describes the response of the Service Water System to this event and why?

A. All 3 service water pumps trip on the SI Signal.
34, 35, and 36 Service Water Pumps start when sequenced on to allow starting current to dissipate.

B. 32 and 33 Service Water Pumps trip on the SI Signal.
36 pump remains running 34 and 35 pumps start when sequenced on to allow starting current to dissipate.

C. All 3 service water pumps trip on the SI signal.
36 pump starts when sequenced on and 34 and 35 pumps are started in RO-1 as necessary to ensure adequate bus load availability.

D. 32 and 33 Service Water Pumps trip on the SI Signal.
36 pump remains running 34 and 35 pumps are started in RO-1 as necessary to ensure adequate bus load availability.

Answer: B

Explanation/Justification:

Drawings 5651D72, and 500B971 Sheet 89
A. Incorrect. Plausible because Non-essential service water pumps (31, 32, 33) strip on SI. Essential pumps (34, 35, 36) do not strip if running. It is true that 34, 35, and 36 Service Water Pumps start when sequenced.

B Correct. Non-essential pumps strip, essential pump remains running and standby essential pumps start.

C. Incorrect. Plausible because Non-essential service water pumps (31, 32, 33) strip on SI. Essential pumps (34, 35, 36) do not strip if running. It is true that 36 will sequence on but so will other ESW pumps.

D. Incorrect. Plausible because 32 and 33 service water pumps will strip on an SI and 36 SW pump will remain running. If pumps failed to automatically start they will be started in RO-1.

Technical References:	5651D72 Sh 8B
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-SW001 6
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#	0000402315 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 # 15

Given the following conditions:

- A steam break occurred on 31 Steam Generator upstream of the MSIVs.
- The team has isolated 31 SG using E-2, Faulted SG Isolation.
- The operator observes 32 SG level rising faster than 33 and 34.

Which of the following describes how Radiation Monitors respond if a SGTR occurred on 32 SG after the SI?

A. R-15 will remain at pre-trip value.
R-62B will increase.
R-19 will remain at pre-trip value.

B. R-15 will remain at pre-trip value.
R-62B will remain at pre-trip value.
R-19 will increase.

C. R-15 will increase.
R-62B will remain at pre-trip value.
R-19 will increase.

D. R-15 will increase.
R-62B will increase.
R-19 will remain at pre-trip value.

Answer: A

Explanation/Justification:

When a SGTR occurs first, R-15 will divert exhaust to containment until SI occurs. Phase A will isolate R-15 exhaust to containment and restore normal lineup to atmosphere.
R-62A-D are GM detectors that will indicate increased activity. They are not N-16 gamma detectors that would not indicate a subsequent SGTR.
R-19 SG Blowdown will isolate on high radiation signal or SI signal. E-2 will restore the lineup for SG Sample, but that does not restore R-19.

A. Correct.

B. Incorrect.

C. Incorrect.

D. Incorrect

Technical References:	3-E-2 9321-F-20173
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPE20 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	000077AK207 Knowledge of the interrelations between Generator Voltage and Electrical Grid Disturbances and the following: - Turbine / generator control	
	Importance	3.6	3.7

Question # 16

Severe weather conditions have resulted in the loss of the feeder from Millwood Substation and multiple local power outages. These events have resulted in swings in megawatts, frequency, and VARs.

Current generator conditions are:

- Generator Hydrogen Pressure 60.0 psig
- MVARs 200 Lead
- Gross Megawatts 1000

Which of the following describes the operator actions in accordance with Graph EL-1, Indian Point Unit 3 Capability Curve?

Lower generator load and:

A. Raise Base Adjuster setpoint.

B. Lower the Base Adjuster setpoint.

C. Raise Auto Voltage Regulator setpoint.

D. Lower Auto Voltage Regulator setpoint.

Answer: C

Explanation/Justification:

Duplicated from question no 26581

A. Incorrect. Plausible because this would work if the voltage regulator was in Manual.

B. Incorrect. Plausible because Base Adjuster will affect VARS if the voltage regulator is in Manual.

C. Correct. Raising the Auto Voltage Regulator will lower leading VARs.

D. Incorrect. Plausible because lowering the Auto voltage Regulator would reduce Lagging VARs.

Technical References:	3-ARP-008 3-GRAPH-EL-1 3-SOP-TG-004
Proposed References to be provided:	3-GRAPH-EL-1
Learning Objective	I3LP-ILO-EDS22K 4 I3LP-ILO-EDS22K 7
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#	1	
	K/A#	00WE042404 Emergency Procedures/Plan - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	
	Importance	4.5	4.7

Question # 17

Given the following conditions:

- The unit was operating at 75% power when a plant transient resulted in a Reactor Trip and Safety Injection.
- E-0, Reactor Trip or Safety Injection, is in progress.
- RCS pressure 1700 psig and slowly lowering.
- Pressurizer PORVs are closed.
- Spray valves are closed.
- Steam Generator wide range levels are 45% and rising slowly.
- Steam Generator pressures are 1000 psig and stable.
- Containment pressure normal.
- Containment sump level normal.
- Radiation Monitors R-2, R-7, R-25 and R-26 are Normal.
- Radiation Monitor R-68 is in alarm.
- Radiation Monitors R-64, R-66 and R-67 are all rising.

What procedure will the CRS direct the crew to transition to?

A. ES-1.1, SI Termination.

B. ECA-1.2, LOCA Outside Containment.

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

D. ECA-1.1, Loss of Emergency Coolant Recirculation

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because a Loss of Coolant is occurring; but SI Termination criteria is not satisfied.

B. Correct. PAB Radiation monitors in containment are normal and in the PAB are elevated.

C. Incorrect. Plausible because pressure is higher than expected for a LOCA and symptoms do not direct a transition to E-2, E-3 or E-1.

D. Incorrect. Plausible because if a LOCA outside containment cannot be isolated, ECA-1.2 directs the crew to ECA-1.1 for loss of emergency coolant recirculation.

Technical References:	2-ECA-1.2 3-ECA-1.2
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPE00 1
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#	00WE11A101 Ability to operate and/or monitor the following as they apply to the Loss of Emergency Coolant Recirculation: - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	
	Importance	3.9	4

Question # 18

Given the following conditions:

- A major LOCA is in progress.
- ECA-1.1, Loss of Emergency Coolant Recirculation is in progress.
- RWST level is 1.5 feet.
- All SGs have been depressurized to 700 psig.

Which of the following criteria are used to determine when to dump steam from the intact SGs?

Dump steam…

A. to maintain RVLIS at the target value.

B. to maintain a cooldown rate of 25°F/HR.

C. as needed to maintain core exit temperature stable.

D. as needed to maintain subcooling in the selected band.

Answer: A

Explanation/Justification:

A. Correct. This will extend the time to deplete the SI accumulators to the maximum allowing time to restore some type of core cooling.

B. Incorrect. Plausible because a cooldown is established in ECA-1.1 if RWST level is > 1.5 feet. In addition, the cooldown rate in ECA-1.1 is 100°F/hr not 25°F/hr.

C. Incorrect. Plausible because dumping steam will decrease core exit thermocouple temperatures; however, this is not a current concern due to the loss of makeup capability.

D. Incorrect. Plausible because subcooling is desired if RWST level is > 1.5 feet; however, this is no longer a target now that all makeup has been lost and the accumulators are the only remaining source.

Technical References:	3-ECA-1.1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPC10 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#	1	
	Group#	2	
	K/A#	000001K206 Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: - T-ave./ref. deviation meter	
	Importance	3	3.1

Question # 19

Given the following conditions:

- Unit 3 is at 72% power.
- Power ascension is in progress.

Which of the following correctly states how the recorder indications for the listed parameters would change during an inadvertent continuous control rod withdrawal event with NO operator action?

A.	Avg Tavg ↑	Tref ↑	Loop ΔT ↑
B.	Avg Tavg ↔	Tref ↑	Loop ΔT ↑
C.	Loop ΔT ↔	OTΔT Setpoint ↑	OPΔT Setpoint ↔
D.	Loop ΔT ↑	OTΔT Setpoint ↔	OPΔT Setpoint ↑

Answer: A

Explanation/Justification:

A. Correct. Positive reactivity from Rod Withdrawal will increase Tavg. Steam Generator pressure will increase and turbine impulse pressure will also increase thus Tref increases.

B. Incorrect. Plausible because if turbine load alone was increased, Tavg would remain constant. Also Tref will increase and Delta T will increase.+

C. Incorrect. Plausible because candidate may believe that Thot gets hotter and Tcold gets hotter by the same amount and Delta T remains the same. OTdeltaT setpoint actually gets smaller and OPdeltaT setpoint does not change.

D. Incorrect. Plausible because Delta T does get larger. OT/DT setpoint will lower.

Technical References:	3-ARP-003 IP3V-171-0052
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICROD 11 I3LP-ILO-AOPROD 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000051K301 Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: - Loss of steam dump capability upon loss of condenser vacuum	
	Importance	2.8	3.1

Question # 20

With the unit operating at 100% power, a leak on the condenser develops causing condenser vacuum to decrease.

Which of the following describes the impact of the loss of vacuum on the High Pressure Steam Dump System?

At ___(1)___ Hg lowering, ___(2)___ .

A. (1) 25"
(2) all steam dump operation is prevented to provide protection for the LP Turbines.

B. (1) 25"
(2) steam dump operation for individual condenser sections is prevented to provide backup protection for a loss of circulating water pump interlock.

C. (1) 18"
(2) all steam dump operation is prevented to provide protection for the LP Turbines.

D. (1) 18"
(2) steam dump operation for individual condenser sections is prevented to provide backup protection for a loss of circulating water pump interlock.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Plausible because the vacuum setpoint is correct; however, a low vacuum isolates all HP Steam Dump Valves not just individual sections. Also the interlock is provided for protection of the Turbine not as a backup for a loss of a circulating water pump.

C. Incorrect. Plausible because 18" Hg is correct for a Turbine trip not prevent HP steam dump operation. It is correct that the low vacuum interlock prevents operation of all HP steam dump valves and is provided for turbine protection

D. Incorrect. Plausible because 18" Hg is correct for a Turbine trip not prevent HP steam dump operation. Also a loss of circulating water pumps impact the steam dumps supplying their condenser section, but a low vacuum isolates all HP Steam Dump Valves not just individual sections. Also the interlock is provided for protection of the Turbine not as a backup for a loss of a circulating water pump.

Technical References:	3-ARP-001
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-SDS001 4
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000074K308 Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling: - Securing RCPs	
	Importance	4.1	4.2

Question # 21

While responding to a LOCA, FR-C.1 Response to Inadequate Core Cooling has been entered due to a valid RED PATH condition. During this procedure the following sequence of actions have been performed:

- Depressurized SGs to 120 psig
- Isolated Accumulators
- Stopped all RCPs
- Depressurized SGs to atmospheric pressure

What was the reason for stopping all RCPs?

A. To prevent mechanical damage to the RCPs.

B. To remove an unnecessary heat source input to the RCS.

C. Securing RCPs later may cause a more severe core uncovery from two phase flow separation.

D. To prevent pumping any of the remaining RCS inventory out the break, a significant factor at reduced RCS pressure.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Plausible because RCPs are a heat input into the system (and are stopped in Heat Sink FRP for that reason) but in this case is not the overriding concern.

C. Incorrect. Plausible because core uncovery is the reason for RCP trip criteria during the initial phases of a small break LOCA.

D. Incorrect. Plausible because during a small break LOCA when saturation conditions exist at the break, continued operation of the RCPs will result in greater mass loss from the RCS.

Technical References:	2-FR-C.1 BG 3-FR-C.1 Background
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPFRC 3
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000061A206 Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: - Required actions if alarm channel is out of service	
	Importance	3.2	4.1

Question # 22

Given the following conditions:

- The unit is operating at 100% power when I&C reports to the CRS that recent maintenance on Area Radiation Monitor R-1, CCR Area, was performed using non-qualified parts.
- The CRS declares R-1 inoperable.

Which of the following identifies an action, if any, which must be performed in response to the R-1 being declared inoperable?

A. Manually transfer control room ventilation to 100% recirc mode.

B. Direct HP to install a portable air sampling unit in the control room.

C. Direct HP to install a portable radiation monitor in the control room.

D. No action is required as long as R-33 CCR Radiogas remains operable.

Answer: D

Explanation/Justification:

A is incorrect but plausible because if a failure of R-1 were to occur, it would auto shift ventilation.

B. Incorrect but plausible because candidate may believe that air sample is adequate to satisfy requirements.

C. Incorrect. But plausible as OAP-35 directs installation of a portable radiation monitor for direct immediate readout if BOTH the R-1 and R-33 are inoperable.

D. Correct.

Technical References:	3-ONOP-RM-1 OAP-035
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ONPRM1 4 I3LP-ILO-ONPRM1 6
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	0000682434 Emergency Procedures/Plan - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	
	Importance	4.2	4.1

Question # 23

Which of the following describes the RO (ATC) task for safe shutdown outside the control room and reason for this task?

A. Establish AFW flow within 30 minutes of the event initiation to ensure steam generators do not dry out.

B. Establish charging with 60 minutes of the event initiation to ensure adequate shutdown margin is maintained.

C. Establish AFW flow within 60 minutes of the event initiation to ensure RCS pressure does not exceed PORV setpoints.

D. Establish charging within 30 minutes of the event initiation to ensure pressurizer level remains in the indicating range.

Answer: A

Explanation/Justification:

A. Correct answer per AOP-SSD-1 and OAP-115.

B. Incorrect but plausible since this is the correct time for establishing charging.

C. Incorrect but plausible since the RO does establish AFW flow. The time and reason are incorrect, but plausible

D. Incorrect but plausible since charging is established early in the event for this reason, but not by the RO.

Technical References:	3-AOP-SSD-1 OAP-115
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPSSD F
Question Source:	New
Question History:	None
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	000076A104 Ability to operate and/or monitor the following as they apply to the High Reactor Coolant Activity: - Failed fuel-monitoring equipment	
	Importance	3.2	3.4

Question # 24

Given the following conditions:

- The Plant is operating at 100% power.
- Repairs to TCV-130, Non-Regen HX CCW Outlet Flow Control Valve are necessary.
- Normal letdown will be isolated for approximately one day.
- During the letdown outage, the watch chemist reported that RCS activity has increased.

Which of the following describes how R-63A/B are operated during the maintenance outage?

A. R-63A/B are removed from service.
Water is supplied to the detector from CVCS letdown and is returned to the VCT.

B. R-63A/B are removed from service.
Water is supplied to the detector from RCS Sample System and returned to the CVCS HUT.

C. R-63A/B remain in service.
Water is supplied to the detector from RCS Sample System and returned to the VCT.

D. R-63A/B remain in service.
Water is supplied to the detector from RCS Sample System and returned to the CVCS HUT.

Answer: C

Explanation/Justification:

Drawing 9321-F-27453
A. Incorrect. Plausible because it is a common misconception that R63A/B is supplied from letdown which would require isolating it.

B. Incorrect. Plausible because it is a common misconception that R63A/B is supplied from letdown which would require isolating it.

C. Correct.

D. Incorrect. Plausible because water is supplied from the Sample System, but it is NOT returned to the HUT.

Technical References:	9321-F-27453
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RCSPSS 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	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 # 25

Given the following conditions:

- The team is performing the actions of ES-1.1, SI Termination.
- At step 4 of ES-1.1, the team secured all SI and RHR Pumps.
- At step 8 of ES-1.1, the team started one charging pump.
- During subsequent actions RCS Pressure and Pressurizer Level begin to lower.

Which one of the following describes the required operator actions in accordance with ES-1.1?

A. Manually re-initiate SI and Transition to E-0, Reactor Trip or Safety Injection step 1.

B. Restart one charging pump and if Pressurizer Level cannot be maintained transition to E-1, Loss of Reactor or Secondary Coolant.

C. Monitor RCS Pressure and Pressurizer Level, if pressure and level continue to lower, restart SI pumps and return to procedure previously in effect.

D. Adjust charging flow and if Pressurizer Level cannot be maintained, then restart SI pumps as required and transition to E-1, Loss of Reactor or Secondary Coolant.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because candidate may believe that a new event has occurred and that restarting in E-0 is appropriate.

B. Incorrect. Plausible because the transition to E-1 is correct; however, the SI pumps must be started first.

C. Incorrect. Plausible because candidate may believe that returning to the procedure previously in effect will resume mitigation strategies for that event.

D. Correct. These are the actions of step 6 in ES-1.1 and foldout page criteria.

Technical References:	2-E-1 2-ES-1.1 3-E-1 3-ES-1.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-EOPE10 3 I3LP-ILO-EOPS10 3
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	00WE03K101 Knowledge of the operational implications of the following concepts as they apply to the LOCA Cooldown and Depressurization: - Components, capacity, and function of emergency systems	
	Importance	3.4	4

Question # 26

Given the following conditions:

- The crew has entered ES-1.2 in response to a small break LOCA.
- RCS pressure has stabilized at approximately 1200 psig.
- The crew is at the step to determine if Charging Flow has been established.

Which of the following describes how charging pumps will be operated and why?

A. ALL Charging pumps are started and operated at maximum speed to provide sufficient makeup so that SI Pumps can be stopped later.

B. ALL charging pumps are started and operated at maximum speed to limit the heat load on the Component Cooling Water System.

C. Charging pumps are started and operated as necessary to increase pressurizer level to greater than 29% necessary for flow reduction.

D. Charging pumps are started and operated as necessary to establish conditions for starting and operating reactor coolant pumps.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Plausible because charging pumps are operated at maximum speed; however it is not to limit heat load on CCW. Note: If CCW is not available, charging pumps are operated at maximum speed.

C. Incorrect. Plausible because it may seem that starting charging pumps will increase pressurizer level, but for these conditions it will not. As charging pumps are started, SI pump flow lowers.

D. Incorrect. Plausible because normal RCP conditions are necessary for starting an RCP in ES-1.2; however all pumps are started and operated at maximum speed.

Technical References: 3-ES-1.2

Technical References: 3-ES-1.2
Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPS10 3

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	2	
	K/A#	00WE10K202 Knowledge of the interrelations between the Natural Circulation with Steam Void in Vessel with/without RVLIS 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	3.6	3.9

Question # 27

When attempting to start a RCP at the second step of ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS), why is Pressurizer level required to be raised to 64% prior to pump start?

Assume RVLIS is less than full.

Raising PZR level to 64% will ensure that...

A. the RCP will have sufficient Net Positive Suction Head for the given plant conditions.

B. when the RCP is started, a subsequent decrease in Pressurizer level will not uncover the heaters.

C. the pressurizer will be able to maintain RCS pressure high enough to prevent Nitrogen injection from the accumulators.

D. there is sufficient mass in the Pressurizer to fill the vessel head should a bubble form, to prevent allowing saturated fluid to enter the S/G tubes.

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because there is a NPSH requirement for operating the RCPs. This is satisfied by RCS pressure not PRZR level.

B. Correct. Low pressurizer level due to collapse of the head bubble will de-energize the pressurizer heaters. This will result in loss of pressure control.

C. Incorrect. Plausible because as the head bubble collapses, RCS pressure will decrease, Nitrogen injection into the RCS is not the reason.

D. Incorrect. Plausible because as the head bubble collapses pressurizer level will decrease; however saturated fluid entering the SGs is not the reason.

Technical References:	3-ES-0.3 Background
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPS00 4
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#	1	
	K/A#	003000K614 Knowledge of the effect of a loss or malfunction of the following will have on the RCPS: - Starting requirements	
	Importance	2.6	2.9

Question # 28

Which of the following conditions will prevent starting a RCP when the selected RCP START/STOP SWITCH is taken to START, IAW 3-SOP-RCS-1, Reactor Coolant Pump Operation?

A. Seal Injection flow 5 gpm.

B. Seal Return flow <1.0 gpm.

C. RCP Bearing Lift Oil pressure 400 psig.

D. RCP Bearing Lift Oil Pump in service for only 5 minutes.

Answer: C

Explanation/Justification:

The only interlock which will prevent RCP start is Bearing Lift Oil pressure <500 psig.
There is an administrative item for bearing lift oil pump running >2 minutes. The seal injection and return flows are prerequisites, but not interlocks, as the question is asking what will prevent start when switch is taken to start.
Drawing 9321-LL-31133, Schematic Diagram 6900V. Switchgear 31.

Technical References:	3-SOP-RCS-001 9321-LL-31133 Sh 7
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RCSRCP 6 I3LP-ILO-RCSRCP 8
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#	0040002242 Equipment Control - Ability to recognize system parameters that are entry level conditions for Technical Specifications.	
	Importance	3.9	4.6

Question # 29

Given the following conditions:

- The plant is operating at 100% power.
- 32 Charging Pump was removed from service 7 days ago for maintenance.

Subsequently:

- A loss of 480V Bus 6A occurs.
- The appropriate procedure steps for these conditions are carried out.

What are the TRM implications for the Bus 6A failure?

A. Two Boration System required charging pumps are inoperable. Enter TRO 3.0.C.

B. One Boration System required charging pump is inoperable. Enter TRO 3.1.C.1.

C. Two Appendix R Equipment required charging pumps are inoperable. Enter TRO 3.0.C.

D. One Appendix R Equipment required charging pump is inoperable. Enter TRO 3.7.B.

Answer: B

Explanation/Justification:

Loss of Bus 6A will cause a loss of power to 33 Charging. With 32 Charging pump out of service, two charging pumps are out of service; however TRO 3.1.C.1 only requires 2 charging pumps operable. Thus only one "required" pump is inoperable. Note has a 72 hour completion time.

A. Incorrect but plausible since two charging pumps are inoperable; however, since the TRO only requires two charging pumps, only one required pump is inoperable.

B. Correct answer.

C. Incorrect but plausible since two charging pumps are inoperable; however, TRM requires 31 and 32 charging pumps specifically for Appendix R Equipment. Thus only one "required" pump is inoperable.

D. Incorrect but plausible since one required Appendix R charging pump is inoperable; however, it was declared inoperable at least 7 days ago, and this action was entered at that time. Note this is a 30 day completion time.

Technical References:	TRM
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-CVC001 10
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	004000K301 Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: - CRDS (automatic)	
	Importance	2.5	2.9

Question # 30

Given the following conditions:

- The reactor is operating at 90% steady state power when VCT level transmitter LT 112 fails low.
- RCS Tavg is 1.0°F below Tref.

Assuming <u>no</u> operator actions are taken, which of the following conditions will occur for this event?

1. Letdown diverts to CVCS HUT.
2. Blended makeup is initiated
3. CH-LCV-112C closes and CH-LCV-112B opens
4. Rods step out

A. 1, 2, 3.

B. 2, 3, 4.

C. 1, 2, 4.

D. 1, 3, 4.

Answer: B

Explanation/Justification:

At 22% Blended makeup is initiated.
At 9% RWST makeup through LCV-112B is initiated.
No low level alarm while makeup is armed.
Approximately 27 gpm charging from RWST increases RCS boron. Rods step out to control temperature.

A. Incorrect.

B. Incorrect

C. Correct

D. Incorrect

Technical References:	3-AOP-CVCS-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-CVC001 4 I3LP-ILO-CVC001 6
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#	005000K509 Knowledge of the operational implications of the following concepts as they apply to the RHRS: - Dilution and boration considerations	
	Importance	3.2	3.4

Question # 31

Given the following conditions:

- The plant is being cooled down to 140°F for maintenance which will NOT require the RCS be opened.
- The crew is in the process of placing the first Residual Heat Removal (RHR) train in service for RCS cooling.
- Current RCS temperature is 345°F.
- Core burnup is 525 EFPDs.
- RHR (train to be placed in service) boron 1020 ppm
- RCS Boron is 2025

Before the RHR train can be placed in service for RCS cooling, RHR boron concentration must be increased by a MINIMUM of . . . .

A. 455 ppm.

B. 1005 ppm.

C. 1030 ppm.

D. 1080 ppm.

Answer: A

Explanation/Justification:

Duplicated from question no 17336
A. Correct. The minimum concentration to place RHR in service per graph RCS-4 is 1475.

B. Incorrect. Plausible because this is amount to achieve 68° shutdown margin.

C. Incorrect. Plausible because this is the amount to achieve RCS boron concentration

D. Incorrect. Plausible because this is the amount to achieve Refueling Boron Concentration.

Technical References:	3-SOP-RHR-001
Proposed References to be provided:	3-GRAPH-RCS-4
Learning Objective	I3LP-ILO-RHR001 8 I3LP-ILO-POP002 4
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	006000K109 Knowledge of the physical connections and/or cause-effect relationships between the ECCS and the following systems: - Nitrogen	
	Importance	2.6	2.9

Question # 32

Which of the following describes the bases for limiting intact SG depressurization performed in ECA-0.0, Loss of All AC Power, to 275 psig, but not less than 175 psig?

The upper limit of 275 psig ___(1)___ . The lower limit of 175 psig ___(2)___ .

A. (1) minimizes loss of RCS inventory
(2) provides and adequate steam pressure to 32 AFW Pump

B. (1) minimizes loss of RCS inventory
(2) prevents the injection of SI accumulator nitrogen into the RCS

C. (1) prevents entry into FR-P.1, Response to Imminent Pressurized Thermal Shock Condition
(2) provides and adequate steam pressure to 32 AFW Pump

D. (1) prevents entry into FR-P.1, Response to Imminent Pressurized Thermal Shock Condition
(2) prevents the injection of SI accumulator nitrogen into the RCS

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because minimizing loss of inventory is correct for the upper limit; however, steam supply to 32 AFW pumps in not correct but 32 AFW pump is the only supply in ECA-0.0.

B. Correct.

C. Incorrect. Plausible because some procedures (e.g., FR-C.2) identify accumulator injection as a potential entry to FR-P.1. Also in ECA-0.0, 32 AFW pump is the only supply of water to the SGs.

D. Incorrect. Plausible because some procedures (e.g., FR-C.2) identify accumulator injection as a potential entry to FR-P.1. Also Nitrogen injection is the correct reason for the lower limit.

Technical References:	3-ECA-0.0 Background
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPC00 3
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#	2	
	Group#	1	
	K/A#	006000A407 Ability to manually operate and/or monitor in the control room: - ECCS pumps and valves	
	Importance	4.4	4.4

Question # 33

Given the following conditions:

- A large break LOCA has occurred.
- The crew is performing ES-1.3, Transfer to Cold Leg Recirculation.
- Following SI reset and Containment Spray reset, the first Safety Injection Recirculation Switch step manipulation (Recirc Switch 1 and 3 rotated to ON) is performed.

Which of the following identifies the expected change in plant status as a result of performing this step of the procedure?

A. BOTH RHR Pumps stopped ONLY.

B. 32 SI Pump, and 31 Containment Spray Pump are stopped.

C. BOTH RHR Pumps, 32 SI Pump, and 32 Containment Spray Pump are stopped.

D. 31 RHR Pump, 32 SI Pump, and 31 Containment Spray Pump are stopped.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because both RHR pumps are secured, but 32 SI pump and 32 Spray pump are also secured.

B. Incorrect. Plausible because 32 sip can supply either BIT or Non-BIT headers, but it is secured. Also containment spray will be realigned in ES-1.3 if it is required so it is plausible that both pumps would be secured. Both RHR pumps are also secured.

C. Correct.

D. Incorrect. Plausible because 32 sip can supply either BIT or Non-BIT headers, but it is secured. Also containment spray will be realigned in ES-1.3 if it is required so it is plausible that both pumps would be secured. It is correct that both RHR pumps are secured.

Technical References:	3-ES-1.3
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-SIS001 2
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	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 # 34

After a discharge to the PRT, how is PRT temperature lowered as necessary in accordance with 3-SOP-RCS-007, Pressurizer Relief Tank Operations?

A. Drain to RCDT, vent the PRT.

B. Drain to RCDT, spray the PRT.

C. Drain to reactor sump, vent the PRT.

D. Drain to reactor sump, spray the PRT.

Answer: B

Explanation/Justification:

3-SOP_RCS-007, PRT Operations, Section 4.5, PRT Temperature Control, says to fill and drain per 4.3 PRT level control. 4.3.2 directs lowering of PRT level by draining to suction of RCDT pumps to pump to CVCS HUT. 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-27193 shows relationship between PRT, RCDT, RCDT pumps, containment sump, and Rx sump.

Technical References:	3-SOP-RCS-007 9321-F-27193
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RCSPZR 2
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 3

Comments

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

Question # 35

Given the following conditions:

- RCS Temperature is 185°F
- 32 RHR pump and Heat Exchanger are in service.

Subsequently:

- Both CCW Surge Tank levels started lowering.
- The crew entered 3-AOP-CCW-1, Loss of Component Cooling Water.
- The crew split the CCW headers.
- The leak is determined to be on 31 Waste Gas Compressor.
- Leak isolation is in progress.
- 33 CCW pump trips on overcurrent and cannot be restarted.

Which of the following describes the plant response to the event and procedural actions to mitigate this event?

A. 32 CCW pump will auto start and supply 32 RHR pump and Heat Exchanger. Re-enter 3-AOP-CCW-1 to verify plant conditions.

B. 32 CCW Pump will auto start. Normal system lineup (Un-split headers) will be established in 3-AOP-CCW -1 to restore cooling to RHR.

C. 32 CCW pump will not auto start. Enter 3-AOP-RHR-1, Loss of RHR, and establish cooling using 31 RHR Pump and Heat Exchanger.

D. 32 CCW pump will not auto start. Enter 3-AOP-RHR-1, Loss of RHR, and re-establish CCW cooling using 32 RHR pump and heat exchanger.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because with normal system lineup, 32 CCW pump would start and supply flow to the RHR pump and heat exchanger; however with the CCW headers split, 32 CCW pump is placed in Trip Pull Out.

B. Incorrect. Plausible because with normal system lineup, 32 CCW pump would start and supply flow to the RHR pump and heat exchanger; however with the CCW headers split, 32 CCW pump is placed in Trip Pull Out. Also, 3-AOP-CCW-1 does not restore normal CCW header lineup.

C. Correct. 32 CCW pump is in Trip Pull Out and RCS cooling is restore using 3-AOP-RHR-001.

D. Incorrect. Plausible because 32 CCW pump will not auto start and restoring CCW lineup would re-establish cooling, but it is not directed in AOP-RHR-1.

Technical References:	3-AOP-CCW-1 3-AOP-RHR-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPCCW 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#	2	
	Group#	1	
	K/A#	010000K107 Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: - Containment	
	Importance	2.9	3.1

Question # 36

Given the following conditions:

- The unit is operating at 100% power.
- Pressure Defeat Switch is in Defeat 1 & 4.

Subsequently:

- Pressure Transmitter 457 fails low.
- A malfunction in the switchyard caused a large load rejection.

Approximately 10 minutes later the following conditions exist:

- Safety Injection has actuated and all equipment operated as designed.
- RCS pressure is approximately 1000 psig and stable
- VC pressure is approximately 0.5 psig and rising slowly

Which of the following identifies the cause for the indications if no operator actions have been taken?

A. PORVs and spray valves did not open.
RCS Code Safety Valve Lifted and did not reseat.

B. Spray Valves did not open.
PORV 455C opened and did not reseat.

C. Spray Valves did not open.
PORV 456 opened and did not reseat.

D. PORVs and Sprays controlled RCS pressure.

Answer: A

Explanation/Justification:

A. Correct. With Channel 3 (PT-457) in control and failed low PORVs and Spray Valves would not operate. Controlling channel is the input to PCV-455C and channel 3 is the interlocking channel for PCV-456.

B. Incorrect. Plausible because pressure would increase. Candidate must recall which channel is in control for various Defeat Switch positions. PCV 455C is controlled from the master controller and thus would not operate or stick open.

C. Incorrect. Plausible because pressure would increase. Candidate must recall which channel is in control for various Defeat Switch positions. PCV 456 is controlled from the alarm channel and thus would not operate or stick open.

D. Incorrect. Plausible because by under normal conditions, (No transmitter failure) the spray valves and PORV would limit pressure.

Technical References:	Syst Desc 1.4
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICPZPC 11
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 3

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	012000A305 Ability to monitor automatic operation of the RPS, including: - Single and multiple channel trip indicators	
	Importance	3.6	3.7

Question # 37

Given the following conditions:

- A rapid load reduction is in progress.
- OVERTEMP ΔT CHANNEL TRIP OR ROD STOP alarm has annunciated.
- The reactor is not tripped.

Which of the following combinations of inputs would cause this condition?

A. PT-455 failed <u>LOW</u>
Loop 1 Thot microprocessor failed <u>HIGH</u>

B. PT-456 failed <u>HIGH</u>
Loop 2 Thot microprocessor failed <u>LOW</u>

C. PT-457 failed <u>LOW</u>
Loop 4 Thot microprocessor failed <u>HIGH</u>

D. PT-474 failed <u>HIGH</u>
Loop 3 Thot microprocessor failed <u>LOW</u>

Answer: A

Explanation/Justification:

A. Correct. Both inputs have failed to the actuate position for OT delta T, but the inputs are for the same channel, thus only one of four OTdeltaT channels is tripped.

B. Incorrect. Both inputs have failed to a condition that would not actuate OT delta T. The alarm would not be annunciated.

C. Incorrect. Both channel have failed to the actuate condition, but they are on different channels and would cause a reactor trip.

D. Incorrect. Both inputs have failed to a condition that would not actuate OT delta T. They are on different channels and would not cause a reactor trip.

Technical References:	IP3V-171-0052
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICRCT 5 I3LP-ILO-ICRCT 6
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#	013000K412 Knowledge of ESFAS design feature(s) and/or interlock(s) which provide for the following: - Safety injection block	
	Importance	3.7	3.9

Question # 38

Which of the following will unblock the PZR Low Pressure SI signal during the heatup and startup of the plant following a refueling outage?

A. When BOTH reactor trip breakers are closed.

B. When 2 out of 3 PZR pressure channels go above the auto pressurizer SI setpoint.

C. When 2 out of 3 PZR pressure channels go above the pressurizer SI block/unblock setpoint.

D. When the control room operator places the Safety Injection Key-Lock Defeat Switches to the normal position as directed by procedure.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because cycling reactor trip will remove SI Block that resulted from an actual SI signal with subsequent SI Reset NOT low pressure SI Block.

B. Incorrect. Plausible because the Low Pressure SI setpoint is lower (1780 psig) than the SI Block setpoint (1880).

C. Correct.

D. Incorrect. Plausible because the switch used to block low pressure SI can be used to unblock Low Pressure SI. This is not the same switch as the Key Lock Defeat Switch.

Technical References:	Syst Desc 10
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ESS001 6 I3LP-ILO-ICPZPC 6
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	022000A301 Ability to monitor automatic operation of the CCS, including: - Initiation of safeguards mode of operation	
	Importance	4.1	4.3

Question # 39

Given the following conditions:

- The plant is operating at 100% power.
- 31, 33, and 35 FCUs are in service to provide Containment Cooling.

Subsequently, the reactor trips and safety injection actuates.

Which of the following describes the resulting Containment Cooling lineup?

A. All FCUs will be in service. Cooling water flow is raised by TCV-1103 failing to the open position.

B. All FCUs will be in service. Cooling water flow is raised by providing a Service Water flow path parallel to TCV-1103.

C. All FCUs must be manually started in RO-1, BOP Operator Actions During Use of EOPs. Cooling water flow is raised by TCV-1103 failing to the open position.

D. All FCUs must be manually started in RO-1, BOP Operator Actions During Use of EOPs. Cooling water flow is raised by providing a Service Water flow path parallel to TCV-1103.

Answer: B

Explanation/Justification:

A Incorrect. Plausible because all FCUs will start on the SI signal; however increase cooling water is provided through parallel path valves (1104 and 1105) which open on an SI signal.

B. Correct.

C. Incorrect. Plausible because FCUs do not automatically on a NON-SI blackout and must be manually started in ES-0.1 Reactor Trip Response. Also Cooling water in increased to FCUs but by opening parallel path around TCV-1103

D. Incorrect. Plausible because FCUs do not automatically on a NON-SI blackout and must be manually started in ES-0.1 Reactor Trip Response. Also it is true that increased cooling water is provided through parallel path valves (1104 and 1105) which open on an SI signal.

Technical References:	Syst Desc 10.3
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-VCCARC 4
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	022000K201 Knowledge of bus power supplies to the following: - Containment cooling fans	
	Importance	3	3.1

Question # 40

Given the following condition:

- The unit is operating at 100% power with Fan Cooler #32 tagged out for maintenance.

Subsequently:

- A LBLOCA occurs coincident with a Loss of Off Site Power.
- Emergency Diesel # 33 fails to start.
- Local efforts to start the diesel by the NPO are unsuccessful.

Based only on the actions taken above, what containment cooling equipment is expected to be running when the crew exits E-0?

A. #31, #33 and #34 Fan Cooler Units, #32 Spray Pump.

B. #33, #34,and #35 Fan Cooler Units, #31 Spray Pump.

C. #34 and #35 Fan Cooler Units, #31 Spray pump.

D. #34 and #35 Fan Cooler Units, #32 Spray Pump.

Answer: D

Explanation/Justification:

Bus 5A emergency power 33 EDG
Bus 5A supplies 31 and 33 Fan Cooler Units and 31 Spray Pump

Bus 2A/3A emergency power 31 EDG
Bus 2A supplies 32 Fan Cooler Unit and bus 3A supplies 34 Fan Cooler Unit

Bus 6A emergency power 32 EDG
Bus 6A supplies 35 Fan Cooler Unit and 32 Spray Pump

A. Incorrect.

B. Incorrect

C. Incorrect

D. Correct

Technical References:	3-AOP-480V-1 Logic Unit 3 Sheet 7 Logic Unit 3 Sheet 8 Logic Unit 3 Sheet 8B
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-VCCARC 1 I3LP-ILO-VCCARC 3
Question Source:	Bank
Question History:	None
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#	026000K302 Knowledge of the effect that a loss or malfunction of the CSS will have on the following: - Recirculation spray system	
	Importance	4.2	4.3

Question # 41

Given the following conditions:

- A LOCA occurred.
- A common mode failure resulted in both spray pumps failing to start.
- Containment pressure peaked at 28 psig.
- The team is performing actions in 3-ES-1.3, Transfer to Cold Leg Recirculation.
- Containment pressure is currently 15 psig and lowering.

Which of the following describes the operation of the recirc spray system for these conditions?

Recirc Spray ___(1)___ be placed in service because ___(2)___ .

A. (1) WILL
(2) containment spray has not been in service

B. (1) WILL
(2) containment pressure is still above containment spray initiation setpoint

C. (1) will NOT
(2) 5 FCUs are in service

D. (1) will NOT
(2) there is no Sodium Tetraborate in the sump to be recirculated

Answer: A

Explanation/Justification:

Concept used from Unit 2 Q26602

A is correct. 3-ES-1.3, step 20 states that recirc spray should be initiated if containment pressure was ever above 22 psig, and directs operator to Attachment 6, Containment/Recirculation Spray. After making sure CS pumps are secured if RWST level is <1.5', next step addresses recirc spray. If CS in service less than 4 hours, the operator will establish recirc spray. There is a RNO which states that IF CS has been in service for greater than 4 hours AND either cont press is <16 psig OR 5 FCU running, then return to procedure step in effect.

B is incorrect because while it has correct WILL, there setpoint for CS is wrong.

C and D are both incorrect for saying will NOT. C is additionally incorrect but plausible based on the >4 hour caveat discussed above.

D is plausible if the operator thinks the sole purpose of recirc spray is to lower containment pressure and they don't understand the sodium tetraborate baskets are below the flood level in containment and would have been dissolved if cold leg recirc were being performed.

Technical References:	3-ES-1.3 3-SOP-CS-001
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPS10 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#	039000A302 Ability to monitor automatic operation of the MRSS, including: - Isolation of the MRSS	
	Importance	3.1	3.5

Question # 42

Given the following conditions:

- The plant is operating 25% power.
- 31 Main Boiler Feed Pump is in MANUAL.
- 32 MBFP is tagged out.
- PT-412A, Turbine First Stage Pressure failed during the previous shift and all actions of AOP-INST-1, Instrument/Controller Failures have been completed to remove the channel from service.
- Steam dumps are in auto.

Subsequently, PT-404, Main Steam Header Pressure fails off-scale high.

With no operator action, which of the following describes the effect of this failure?

A. Steam Dumps remain closed. RCS temperature rises until Atmospheric Dump valves open to control RCS temperature.

B. Steam Dumps remain closed. RCS temperature rises until Main Steam Safety Valves open to control RCS temperature.

C. Steam Dumps open. RCS temperature rapidly lowers until Main Steam Line Isolation and Safety Injection actuate.

D. Steam Dumps open. RCS temperature rapidly lowers until steam dumps close at 547°F. Steam dumps will then cycle to maintain 547°F.

Answer: C

Explanation/Justification:

A. Incorrect but plausible if candidate has misconception about steam dump operation.

B. Incorrect but plausible if candidate has misconception about steam dump operation.

C. Correct answer. With 412A failed and actions of AOP-INST-1 complete, half the high steam flow logic is made up. When 404 fails the steam dumps will open and lower RCS Tave until the SI/Main Steam Isolation setpoint is reached.

D. Incorrect but plausible if candidate has misconception about steam dump operation.

Technical References:	Syst Desc 18.1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-SDSHP 3 I3LP-ILO-SDS001 3
Question Source:	Bank
Question History:	Unit 2 NRC 2014
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#	059000K302 Knowledge of the effect that a loss or malfunction of the MFW System will have on the following: - AFW System	
	Importance	3.6	3.7

Question # 43

Given the following conditions:

- The Unit is operating at 25% reactor power.
- 33 Main Feedwater Regulating Valve (MFRV) is in manual control for trouble-shooting.

Subsequently, operators inadvertently allowed 33 Steam Generator to fill to 76% level.

Which of the following describes the <u>sequence</u> of events over the next five minutes that would occur if no other actions were taken?

A. Reactor trip, turbine trip, both BFPs trip, motor driven AFW pump start.

B. Turbine trip, motor driven AFW pumps start, reactor trip, both BFPs trip.

C. Reactor trip, both BFPs trip, turbine trip, motor driven AFW pumps start.

D. Turbine trip, both BFPs trip, motor driven AFW pumps start, reactor trip.

Answer: D

Explanation/Justification:

This question looks at the events that occur directly from the High SG level and those that occur as a result of some other event/action. The high level will directly trip the Main Turbine and Main Boiler Feed Pumps. Tripping the Main Boiler Feed Pumps will auto start the AFW pumps and the Turbine Trip will trip the reactor.

A. Incorrect. The reactor trip is a result of the turbine trip and must occur later.

B. Incorrect. The motor driven AFW pumps start as a result of tripping the MBFP and must occur later.

C. Incorrect. The reactor trip is a result of the turbine trip and must occur later.

D. Correct. The turbine and MBFP trip as a result of the high SG level. Motor Driven AFW pumps start and the reactor trips as a result of MBFP trips and turbine trip.

Technical References:	2-AOP-TURB-1 3-AOP-TURB-1 Logic Unit 3 Sheet 13
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MFW001 13 I3LP-ILO-MFW001 5
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	061000K501 Knowledge of the operational implications of the following concepts as they apply to the AFW System: - Relationship between AFW flow and RCS heat transfer	
	Importance	3.6	3.9

Question # 44

Given the following conditions:

- A plant startup is in progress in accordance with POP-1.3, Plant Startup from Zero to 45% Power.
- AFW is in service.

Which of the following describes when feedwater flow is transferred from AFW to MFW and why?

A. Prior to 4% reactor power; to prevent exceeding the capacity of the Motor driven AFW pumps.

B. Prior to 4% reactor power; experience has shown this is the minimum controllable feed flow on the low flow bypass valves.

C. Prior to 5% reactor power; AFW must be declared operable for its safeguard function just prior to entering Mode 1.

D. Prior to 5% reactor power; adequate MFW flow will exist to ensure the recirculation valve can be closed minimizing flow perturbations.

Answer: A

Explanation/Justification:

A. Correct

B. Incorrect. Plausible because we do have procedure steps that are based on plant experience. We have transferred at lower power levels than 4%.

C. Incorrect. Plausible because candidate may believe that OPERABLE in mode 1 means in lined up for Automatic.

D. Incorrect. Plausible because automatic operation of the MBFP recirc valve does cause significant flow perturbations; however the recirc valves operate to maintain minimum flow through the pumps.

Technical References:	2-AOP-FW-1 3-AOP-FW-1 3-AOP-FW-1 Background
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MFW001 3 I3LP-ILO-AFW001 3
Question Source:	Bank
Question History:	Unit 3 NRC 2010
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#	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 # 45

Given the following conditions:

- The plant is at 10% power when a loss of off-site power occurs.
- Bus 2A has an overcurrent lockout.
- No action has been taken by the crew.

Which of the following describes the automatic response of the Auxiliary Feedwater system for these conditions?

A. All AFW pumps running approximately 200 gpm to each SG.

B. 33 Motor Driven AFW pump only operating approximately 200 gpm to each SG.

C. 31 and 33 Motor driven AFW pumps only running approximately 200 gpm to each SG.

D. 32 Turbine Driven AFW and 33 Motor Driven AFW pumps are operating with approximately 200 gpm to 2 SGs.

Answer: D

Explanation/Justification:

Duplicated from question no 26220

The main boiler feed pump will not trip (auto start signal for motor driven pumps).
The Non-SI blackout signal will occur for bus 6A (Auto start signal for 32 and 33 AFW pumps)
32 AFW pump will start at idle speed. Manual action is required to feed the SGs.
Bus 3A is the power supply to 31 AFW pump; however it will not be energized due to loss of bus 2A; therefore, 31 AFW pump will have no power.

A. Incorrect. Plausible candidate must recall that for these conditions, 3A will not be energized and 31 pump will not start.

B. Incorrect. Plausible because bus 3A (power supply to 31 pump) is not specifically damaged; but without 2A it cannot be energized.

C. Incorrect. Plausible because 33 pump will be operating; however 32 will be running at idle speed AND 33 pump can only supply 33 and 34 SGs.

D. Correct.

Technical References:	3-AOP-480V-1 Syst Desc 21.2
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AFW001 3
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#	062000K303 Knowledge of the effect that a loss or malfunction of the A.C. Distribution System will have on the following: - DC system	
	Importance	3.7	3.9

Question # 46

Unit 3 is operating at 100% power when a Reactor Trip coincident with a Loss of Offsite power occurs.

What is the required action or system response for restoration of charging 32 Battery?

A. The 32 Battery Charger will reenergize when the Nuclear Plant Operators align and reset MCC 37.

B. Dispatch a Nuclear Plant Operator to place 35 Battery Charger in service to charge 32 Battery.

C. The Nuclear Plant Operator will have to manually restart 32 Battery Charger after aligning and resetting MCC 37.

D. 32 Battery Charger will reenergize on restoration of AC power to Bus 6A from the diesel since MCC 37 is not stripped on the undervoltage condition.

Answer: A

Explanation/Justification:

A. Correct. The supply breaker to MCC37 will strip on any station blackout or SI. The NPO must restore power to the MCC to re-energize the Battery Charger. The supply breaker to the battery charger from the MCC does not strip

B. Incorrect. Plausible because 35 Battery Charger can be aligned to supply power to 32 DC Power Panel. This would only be done if 32 Battery Charger was not available.

C. Incorrect. Since many loads breakers trip on an undervoltage condition, candidate may believe that 32 battery charger breaker trips. The candidate may believe that manual action is required to restart the battery charger when power is restored to the MCC.

D. Incorrect. Plausible because some MCCs do not strip on an undervoltage condition, but MCC37 is not one of them. The supply breaker must be Reset to close and re-energize the MCC.

Technical References:	3-SOP-EL-015
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDS480 5 I3LP-ILO-EDS480 8
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	062000A103 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the A.C. Distribution System controls including: - Effect on instrumentation and controls of switching power supplies	
	Importance	2.5	2.8

Question # 47

I&C needs to place 31 Static Inverter in Reverse Transfer for troubleshooting.

Which of the following describes what must be done with the Hi-Hi Containment Spray relays and why?

A. Install physical blocks on relays to prevent Containment Spray actuation signal during the swap from static inverter to backup power supply due to momentary loss of power.

B. Install physical blocks on relays to makeup ½ the coincidence to initiate containment spray ensuring spray actuation occurs if needed.

C. Bistables are tripped, causing the relays to trip to prevent Containment Spray actuation signal during the swap from static inverter to backup power supply due to momentary loss of power.

D. Bistables are tripped, causing the relays to trip to makeup ½ the coincidence to initiate containment spray ensuring spray actuation occurs if needed.

Answer: B

Explanation/Justification:

Containment spray relays must be energized to actuate spray; most other relays are de-energize to actuate. Blocking the relays puts them in "energized" condition making up ½ the actuation coincidence. This is required because the backup source of power during reverse transfer is MCC 34. MCC 34 is stripped during an SI or Non-SI Blackout. This would prevent Containment Spray if required.

A. Incorrect. Plausible because physical block is correct; however the reason is not correct. A momentary loss of power would not actuate spray.

B. Correct.

C. Incorrect. Plausible because for most protective relays, loss of power will place them in condition to actuate the protective function. Placing the bistables in trip would prevent energizing them.

D. Incorrect. Plausible because for most protective relays, loss of power will place them in condition to actuate the protective function. The reason is correct.

Technical References:	3-SOP-EL-002
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDS118 3
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#	063000A101 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the D.C. Electrical System controls including: - Battery capacity as it is affected by discharge rate	
	Importance	2.5	3.3

Question # 48

Which of the following describes the 31 Battery response if Battery Charger 31 is lost with <u>no</u> operator action?

A. 31 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 2 hours. Battery voltage will lower at a linear rate.

B. 31 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 2 hours. Battery voltage will lower at an increasing rate as voltage decreases.

C. 31 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 8 hours. Battery voltage will lower at a linear rate.

D. 31 Battery is designed to ensure voltage will remain above a predetermined acceptable value for 8 hours. Battery voltage will lower at an increasing rate as voltage decreases.

Answer: B

Explanation/Justification:

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
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDS125 11 I3LP-ILO-EDS125 4
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#	063000A401 Ability to manually operate and/or monitor in the control room: - Major breakers and control power fuses	
	Importance	2.8	3.1

Question # 49

Given the following conditions:

- Unit 3 is operating at 100% power when the unit trips due to a loss of DC Power Panel 31.
- The plant has been stabilized after the unit trip and the team enters 3-AOP-DC-1, Loss of a 125 VDC Panel.
- The plant starts a cooldown to go to Mode 5.

When can 31 and 32 DC Power Panels be cross connected in accordance with 3-SOP-EL-003, Battery Charger and 125 Volt DC System Operations?

A. When SI is blocked.

B. When the unit enters Mode 4.

C. When the unit enters Mode 5.

D. When the Rod Drive MG set output breakers are open.

Answer: C

Explanation/Justification:

Caution at step 4.11, Cross-Connecting 125 VDC Buses states…"This section SHALL only be performed in Cold Shutdown."

A is incorrect but plausible if operator believes once SI can no longer initiate and the RTBs are open, that cross connecting buses is allowed.

B is incorrect but plausible if the operator believes that cooling down to the next Mode after trip will allow cross connect operation of buses.

C is correct per above.

D is incorrect but plausible if the operator thinks that once no voltage is supplied to RTBs then the buses can be cross connected.

Question meets KA as the DC panels affected and breakers which will be manipulated are in Control Room.

Technical References:	3-SOP-EL-003
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDS125 7
Question Source:	Bank
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	064000A108 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G System controls including: - Maintaining minimum load on ED/G (to prevent reverse power)	
	Importance	3.1	3.4

Question # 50

Which of the following EDG parameters would result in a higher likelihood of a reverse power trip as an EDG is synchronized to its vital bus?

A. Voltage too low

B. Voltage too high

C. Frequency too low

D. Frequency too high

Answer: C

Explanation/Justification:

SOP-EL-001, when performing synchronization, has scope going slowly in fast direction, which results when incoming machine is running slightly faster than running machine. This will tend to make the incoming machine pick up real load when the breaker is hut. So having speed of the machine too low, which is frequency with the field flashed, would result in the incoming machine becoming a load on the running machine. Voltage high or low could cause several problems, such as a large arc upon breaker closing, or circulating currents in the system, but would not act as a real load on system.

Technical References:	3-SOP-EL-001
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDSEDG 6
Question Source:	Bank
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	064000K203 Knowledge of bus power supplies to the following: - Control power	
	Importance	3.2	3.6

Question # 51

Given the following conditions:

- Unit 3 is in MODE 3, at NOP/NOT.
- DC Distribution panel 31 is lost.

Subsequently, a loss of all off-site power occurs.

Which of the following describes the effect the loss of DC Distribution panel 31 will have on the EDGs?

_____ EDGs will be running supplying their respective buses.

A. ALL

B. 31 and 32

C. 31 and 33

D. 32 and 33

Answer: B

Explanation/Justification:

DC distribution panels supplying DC power to the EDGs are:
DC Bus 31 supplies 33 EDG
DC Bus 32 suplies EDG 32
DC bus 33 supplies 31 EDG.
Loss of DC panel will prevent field flash from occurring.

Technical References:	3-SOP-EL-001
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDSEDG 3
Question Source:	Bank
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	073000A403 Ability to manually operate and/or monitor in the control room: - Check source for operability demonstration	
	Importance	3.1	3.2

Question # 52

Which of the following would indicate a Source Check failure on R-18 when performing the source check from Bantam 11?

A. The Check Source indicator extinguishes after one minute.

B. The Channel pushbutton backlight and Oper LED will be off.

C. The RMS CHANNEL TEST/TROUBLE alarm will annunciate on Panel SBF-2.

D. The CHANNEL FAILURE alarm will display on the Radiation Monitoring Control Cabinet.

Answer: D

Explanation/Justification:

When performing a source check from the Bantam 11, a failure will be alarmed on the touch screen for the channel being source checked.

A is incorrect because that would be a normal indication of a completed source check.

B is incorrect as the source check failure indication which would be present if the source check was performed from RM-23, which the R18 is not controlled from would be blinking backlight.

C is incorrect because that alarm is not associated with a source check, but would alarm on hi radiation.

D is correct per above.

Technical References:	3-ONOP-RM-1 3-SOP-RM-008
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RMSPRM 4
Question Source:	New
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 11

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	076000K101 Knowledge of the physical connections and/or cause-effect relationships between the SWS and the following systems: - CCW system	
	Importance	3.4	3.3

Question # 53

Which of the following describes a relationship between Service Water and CCW?

A. Service Water flow is limited thru the CCW Hx's to prevent excessive biofouling.

B. Service Water normally operates at a lower pressure than CCW to prevent leakage into CCW.

C. Service Water outlets on the CCW Hx's have pressure control valves to prevent exceeding SW pump runout.

D. Service Water operates at a higher pressure than CCW to prevent any radiological release from CCW should a tube leak in the CCW/SW Hx occur.

Answer: B

Explanation/Justification:

SW system SOP directs maintaining each SW header pressure 60-97.5psig.
CCW SOP states to maintain header pressure > 100 psig.
CCW header will always be higher than SW header.

Technical References:	3-SOP-CC-001B 3-SOP-RW-005
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-CCW001 6 I3LP-ILO-SW001 4
Question Source:	Bank
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	1	
	K/A#	078000A301 Ability to monitor automatic operation of the IAS, including: - Air pressure	
	Importance	3.1	3.2

Question # 54

Given the following conditions:

- Unit 3 is operating at 100% power.
- 31 Instrument Air Compressor (IAC) is in HAND
- 32 IAC is in AUTO.
- SOV-1142, Station Air Makeup to Instrument Air is in the closed position

Subsequently, a rupture occurs somewhere in the Instrument Air System.

Which of the following identifies the indications which are expected to occur in the Control Room for this event as instrument air pressure lowers?

At ___(1)___ , a red light will illuminate for 32 IAC, and at ___(2)___ a red light for SOV-1142 will illuminate.

A. (1) 105 psig
(2) 100 psig

B. (1) 100 psig
(2) 95 psig

C. (1) 95 psig
(2) 90 psig

D. (1) 90 psig
(2) 85 psig

Answer: C

Explanation/Justification:

Editorially modified to remove redundancy from all choices.

A. Incorrect but plausible. 105# is the unload point for the IA compressors, so it is plausible that an operator could confuse this with 95#. 100# is 5# below this which would be the logical setpoint for 1142 if the operator thought 105# was the auto start setpoint for the standby compressor.

B. Incorrect but plausible. 100# is the load setpoint for an IA compressor in HAND. For the same reasons as A, this would make these setpoints plausible.

C. Correct answer per system description and procedures.

D. Incorrect but plausible. 90# is the actual setpoint for 1142, so these setpoints are plausible.

Technical References:	3-SOP-IA-001 Syst Desc 29.2
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-IA001 4
Question Source:	Bank
Question History:	
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#	103000K404 Knowledge of Containment System design feature(s) and/or interlock(s) which provide for the following: - Personnel access hatch and emergency access hatch	
	Importance	2.5	3.2

Question # 55

Given the following conditions:

- Unit 3 is stable in MODE 3 at NOP/NOT.
- Both containment airlocks are operable.

Which of the following is the <u>maximum</u> number of personnel permitted to be in VC at one time?

A. 6

B. 12

C. 18

D. 24

Answer: D

Explanation/Justification:

In MODES 3 and 4, 24 people are allowed in containment.
In MODES 1 and 2, 12 people are allowed in containment.
This question meets K/A by knowing design feature of containment airlocks which allow a certain number of people to use those airlocks based on the MODE.

Technical References: 0-SOP-CB-001
Proposed References to be provided: None

Learning Objective I3LP-ILO-VCVCB 8

Question Source: New

Question History:

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#	2	
	K/A#	001000K588 Knowledge of the operational implications of the following concepts as they apply to the CRDS: - Effects of boron on temperature coefficient	
	Importance	2.9	3.4

Question # 56

Given the following conditions:

- Unit 3 is operating at 100% power, BOL, steady state.
- A controlled power reduction to 90% is performed using rods only. (No boration)

What would be the difference in control rod position if the same power reduction were performed at EOL, and why?

At EOL, the control rods would be inserted ___(1)___ than at BOL because ___(2)___.

A. (1) less
(2) of fission product poison buildup in the fuel

B. (1) further
(2) of fission product poison buildup in the fuel

C. (1) less
(2) as reactor coolant boron concentration lowers, the thermal utilization of fission neutrons rises.

D. (1) further
(2) as reactor coolant boron concentration lowers, the thermal utilization of fission neutrons rises.

Answer: D

Explanation/Justification:

Moderator temperature coefficient of reactivity gets larger (more negative) as core ages. For a given change in temperature, there will be a larger change in reactivity at EOL. As temperature lowers during the power reduction, MORE positive reactivity will be present form the temp change. This will required control rods be inserted FURTHER to offset that rise in positive reactivity. Control rod worth will also increase over core life, about doubling in pcm/step,(3-GRAPH-RV-7B) but the MTC is more than double BOL/EOL and will require more insertion to offset.

See Graph RV-14, Reactivity Control Parameters for Cycle 20 Reactivity Coefficients and rod worths.

Technical References:	3-GRAPH-RV-14
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICROD 5
Question Source:	New
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	011000K201 Knowledge of bus power supplies to the following: - Charging pumps	
	Importance	3.1	3.2

Question # 57

Given the following conditions:

- Unit 3 is operating at 100% power steady state.
- 33 charging pump is in service.

Subsequently:

- A loss of power occurs to Bus 6A.
- 32 EDG starts and loads Bus 6A.

Which of the following describes how PZR level control will be affected once 32 EDG loading is complete with NO operator action?

The Charging Demand Signal will:

A. rise until maximum demand signal is reached.

B. lower until minimum demand signal is reached.

C. initially rise until PZR returns to program, then stabilize at approximately the pre-event demand.

D. initially lower until charging / letdown mismatch turns PZR level, then stabilize below the pre-event demand.

Answer: A

Explanation/Justification:

With total charging flow of 87 gpm, and letdown flow of 75 gpm, PZR level is stable. 33 charging pump is powered from Bus 6A, but is NOT automatically loaded on bus when 32 EDG starts. With letdown initially still in service and no charging flow, 75 gpm is still coming out of RCS, with no flow going back into RCS. Additionally, seal cooling will be provided from RCS through thermal barrier to RCP seals, an additional loss of inventory.

Using thumbrule of 1% PZR level is 75 gpm (at hot conditions), then the loss of charging pump will cause PZR level to lower at ~ 1.25% per minute.

A is correct

B is incorrect but plausible if the operator confuses charging pump demand with input from pressurizer level.

C is incorrect but plausible if the thumbrule used is incorrect, or if letdown is thought to isolate and a charging pump is running.

D is incorrect but plausible based on combination of letdown and charging flows.

Technical References:	3-SOP-CVCS-002
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EDS480 3 I3LP-ILO-ICPZLV 11
Question Source:	New
Question History:	
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#	015000K602 Knowledge of the effect of a loss or malfunction of the following will have on the NIS: - Discriminator/compensation circuits	
	Importance	2.6	2.9

Question # 58

Given the following conditions:

- The unit is at 100% power
- Alarm, INTERMEDIATE RANGE NO. 1 LOSS OF COMPENSATE VOLTAGE, has just actuated

If a reactor trip were to occur, which of the following describes how intermediate range indication will be affected?

Approximately 10 minutes after the trip, when compared to Intermediate Range 36, Intermediate Range 35 amps indication will read _____ and startup rate (SUR) indication will read _____.

A. lower; less negative

B. lower; more negative

C. higher; less negative

D. higher; more negative

Answer: C

Explanation/Justification:

When the reactor is initially tripped, there will be no difference in the IR channel indication, as the compensating action is for gammas in a lower power range than those initially seen after the trip. However, as power lowers to the level at which compensation is required, the lack of said compensation would allow those gammas to be seen as power, and the channel 35 power indication will indicate higher. SUR will be similarly affected, as power will now not be lowering as fast as if the gammas were being compensated out.

Technical References:	2-AOP-NI-1 3-AOP-NI-1
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-ICEXC 10 I2LP-ILO-ICEXC 4 I3LP-ILO-ICEXC 11 I3LP-ILO-ICEXC 3
Question Source:	Bank
Question History:	
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#	017000K401 Knowledge of ITM System design feature(s) and/or interlock(s) which provide for the following: - Input to subcooling monitors	
	Importance	3.4	3.7

Question # 59

For calculating saturation margin, the QSPDS receives temperature input(s) from ....

A. Tavg ONLY.

B. CETs ONLY.

C. WR RCS Thots and Tavg.

D. CETs and WR RCS Thots.

Answer: D

Explanation/Justification:

The QSPDS receives RCS Thot from each loop and the CETs. It then develops a margin to saturation for each RCS loop, each quadrant of CETs, and for the core.
All the distracters are plausible as they contain parts of the temp monitoring devices.
System Description 1.1, RCS, figure 1.1-23 show RCS loop WR Thots input into RCS Saturation Monitor.

Technical References:	Syst Desc 1.1 Syst Desc 32
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICNXC 4
Question Source:	New
Question History:	
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#	028000A102 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the HRPS controls including: - Containment pressure	
	Importance	3.4	3.7

Question # 60

Given the following conditions:

- The crew is preparing to place 31 Hydrogen Recombiner in service in accordance with 3-SOP-CB-007, H2 Recombiner Operation, following a LOCA.
- Pre LOCA CTMT Pressure was 0 psig.
- Pre LOCA CTMT Temperature was 90 deg. F.
- Post LOCA CTMT Pressure is 6 psig.

Using the attached curves and data sheet, (3-SOP-CB-007, Attachments 1-4.), which of the following is <u>closest</u> to the correct power setting for 31 Hydrogen Recombiner?

A. 54 KW

B. 57 KW

C. 62 KW

D. 75 KW

Answer: A

Explanation/Justification:

Modified from question no 9087
The procedure says to extrapolate the curves (4.1.6.2 bullet).

A is correct per the filled out key.

B is incorrect but plausible as it is the answer for 1 psig pre-LOCA containment press.

C is incorrect but plausible as it's the result using the Pre-LOCA cure of -5 psig.

D is incorrect but plausible as it's the maximum allowed power level (CAUTION after step 4.2.1.2)

Technical References:	3-SOP-CB-007
Proposed References to be provided:	3-SOP-CB-007 pg 6 and Attachments 1-4
Learning Objective	I3LP-ILO-VCPAH2 1
Question Source:	Modified
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	12	
	K/A#	041000A408 Ability to manually operate and/or monitor in the control room: - Steam dump valves	
	Importance	3	3.1

Question # 61

Given the following conditions:

- The plant is at 5% power on the HP steam dumps which are being operated in the automatic pressure mode.
- Rod control is in manual.
- The operator changes the steam dump controller setpoint from 79% to 84%.

The new steady state reactor power will be ___(1)___ the initial reactor power.

A few minutes later after the plant has stabilized, PCV-1134, 31 Steam Generator Atmospheric Steam Dump Valve, fails open due to an instrument failure. When the plant stabilizes the new reactor power level will be ___(2)___ than it was just prior the failure of the atmospheric steam dump valve.

A. (1) lower than
(2) the same as

B. (1) lower than
(2) higher than

C. (1) higher than
(2) the same as

D. (1) higher than
(2) higher than

Answer: A

Explanation/Justification:

Raising the setpoint on the steam dump controller will cause the valves to control at a higher pressure setpoint (open less)
Closing the steam dumps will lower steam flow and thus reactor power.
When PCV-1134 opens, steam pressure will initially lower, then the high pressure steam dump valve will close to compensate and maintain pressure at the setpoint. With the same steam flow, reactor power will stabilize at the same pre-failure level.

A is correct per above.

B. Incorrect. Plausible because raising the controller setpoint will close the valves, reduce steam flow and lower power. The candidate must recognize that the high pressure steam dumps would actually compensate for the failure (ie, close when the atmospheric opened) not make it worse.

C. Incorrect. Plausible because the candidate may believe that raising the setpoint will lower the pressure the steam dumps are controlling at, resulting in opening vs closing. Reactor power being the same is correct.

D. Incorrect. Plausible reactor power would be higher than initial reactor power if there was an increased steam flow through the steam dumps. After the Atmospheric dump opens, the candidate may not recognize that the High Pressure Steam Dumps will close to maintain pressure.

Technical References:	Syst Desc 18.1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-SDS001 3
Question Source:	Bank
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	2	
	Group#	2	
	K/A#	045000A212 Ability to (a) predict the impacts of the following malfunctions or operations on the MT/G System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Control rod insertion limits exceeded (stabilize secondary)	
	Importance	2.5	2.8

Question # 62

Unit 3 is performing a rapid downpower due to secondary plant problems when crew receives ROD INSERTION LOW LOW LIMIT.

Which of the following contains ALL the action(s) directed in accordance with 3-ARP-003, Panel SAF – Reactor Coolant System, to respond to this event?

A. Initiate normal boration in accordance with 3-SOP-CVCS-003, Reactor Coolant System Boron Concentration Control.

B. Initiate emergency boration in accordance with ONOP-CVCS-3, Emergency Boration.

C. Initiate emergency boration in accordance with ONOP-CVCS-3, Emergency Boration, and reduce turbine load as necessary.

D. Initiate emergency boration in accordance with ONOP-CVCS-3, Emergency Boration, reduce turbine load and withdraw control rods as necessary.

Answer: D

Explanation/Justification:

A is incorrect because it is the action for a valid RIL low alarm.

B and C contain 1 of 3 and 2 of 3 actions, respectively, directed in ARP.

D is correct because it contains ALL the actions directed.

Technical References:	3-ARP-003
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-ICROD 9
Question Source:	New
Question History:	
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#	2	
	K/A#	0550002314 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 # 63

Why is at least one set of secondary jets on one Steam Jet Air Ejector (SJAE) required to be placed in service prior to supplying steam to hoggers?

A. To allow the metal piping to heat up gradually to prevent overstressing the air lanes.

B. To allow detection of radioactive releases in case there is steam generator tube leak.

C. To prevent blowing out the loop seal on the discharge piping and creating an air in-leakage source.

D. To provide a pathway for the steam away from the condenser to prevent backfiring during startup.

Answer: B

Explanation/Justification:

When hoggers are to be placed in service without SJAE in service, at least one secondary jet shall be placed in service for SGTL radioactive release detection. (SOP-C-001 CAUTION at top of page 10), as hoggers exhaust directly to atmosphere

Technical References:	3-SOP-C-001
Proposed References to be provided:	None
Learning Objective	I2LP-ILO-MSS001 2 I3LP-ILO-CND001 4
Question Source:	Bank
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	1	
	Group#	1	
	K/A#	056000K103 Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: - MFW	
	Importance	2.6	2.6

Question # 64

Given the following conditions:

- Plant is operating at 81% power.
- No equipment is out of service.
- 31 and 32 Condensate Pumps operating.

Subsequently, 31 Condensate Pump trips due to a winding short

Which of the following describes how the operators will respond IAW 3-AOP-FW-1, Loss of Feedwater?

A. Trip the Reactor, Go To E-0, Reactor Trip or Safety Injection.

B. Ensure MBFP cutback occurs to maintain MBFP suction pressure greater than 315 psig.

C. Ensure 31 and 33 AFW Pumps automatically start; verify MBFP suction pressure greater than 265 psig.

D. Start 33 Condensate Pump, reduce turbine load as necessary to maintain MBFP suction pressure greater than 265 psig.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because tripping of a MBFP at ≥ 80% power requires tripping the reactor and going to E-0.

B. Incorrect. Plausible as the MBFP cutback will occur to maintain suction pressure >265 psig.

C. Incorrect. Plausible because tripping of a MBFP would cause the AFW pumps to automatically start.

D. Correct. 3-AOP-FW-1 directs starting available condensate pumps to recover from this event.

Technical References:	3-AOP-FW-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPFW1 3
Question Source:	Bank
Question History:	None
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#	068000A302 Ability to monitor automatic operation of the Liquid Radwaste System, including: - Automatic isolation	
	Importance	3.6	3.6

Question # 65

Given the following conditions:

- A liquid release of 31 Monitor Tank is in progress in accordance with 3-SOP-WDS-014, Liquid Waste Releases, with discharge flow of 65 gpm
- The operator checks the release progress towards the end of the release, and notes that 31 Monitor Tank level is 12% and discharge rate has remained constant at 65 gpm

Which of the following identifies why the release is still in progress?

A. The release was performed using 31 Monitor Tank pump.

B. The release was performed using 32 Monitor Tank pump.

C. The normal release termination by procedure is 10% tank level.

D. WD-RCV-018, Waste Condensate Discharge to River is failed open.

Answer: B

Explanation/Justification:

The Monitor tank pumps have an auto trip at 15% level in their RESPECTIVE Monitor tank. Level in 31 trips 31 pump, level in 32 trips 32 pump. There is no cross connect. Of the choices presented, the only reason why the release would still be in progress at 65 gpm would be the pump is still running. If the 31 pump were in service it would have stopped automatically at 15% tank level.
This question meets K/A by requiring knowledge of automatic actions associated with the LRS system which will terminate a release.

Technical References:	3-SOP-WDS-014
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-LWR001 5
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 13

Comments

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

Question # 66

Which of the following describes how unconditioned fuel affects the initial power ascension when returning to full power following a refueling outage?

Assume no other special limits or rates have been identified by Reactor Engineering for this fuel cycle.

A. There is no limit on the power ascension rate up to 20% reactor power. Above 20%, power can be raised at 3% per hour, with rod withdrawal limited to 3 steps per hour.

B. There is no limit on the power ascension rate up to 50% reactor power. Above 50%, power can be raised at 3% per hour, with rod withdrawal limited to 3 steps per hour.

C. Power ascension is limited to 10% per hour up to 20% reactor power. Above 20% power can be raised at 3% per hour with no limitation on rod movement.

D. Power ascension is limited to 10% per hour up to 50% reactor power. Above 50% power can be raised at 3% per hour with no limitation on rod movement.

Answer: B

Explanation/Justification:

A. Incorrect but plausible because there no limit up to 50% nor 20% power. The rate of increase is correct, but again above 50% not 20% power.

B. Correct.

C. and D. Incorrect but plausible because it may seem likely that a restriction on power increase may exist up to some value then the more restrictive 3% per hour for the rest of the increase.

Technical References: 3-POP-1.3
Proposed References to be provided: None

Learning Objective I3LP-ILO-POP007 7

Question Source: New

Question History:

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

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

Question # 67

All of the following are required before movement of irradiated fuel can occur in the Spent Fuel Pool EXCEPT:

A. the Fuel Storage Building Emergency Ventilation System must be operable.

B. the spent fuel pit crane hoist load limit interlock must be tested during the dead load test.

C. spent fuel pit water level must be at least 23' above the top of the irradiated fuel assemblies.

D. spent fuel pit boron concentration must be at least 1,000 ppm if a spent fuel pit verification has not been performed since last fuel movement.

Answer: B

Explanation/Justification:

A, C, and D are all incorrect as they are listed in SOP-CM-003 as being required.
B is correct and plausible, as the dead lift test is required, but the load limit interlock is set at 110-115% of max rated load of 2,000 lbs. The bridge hook is rated at 2,000 pounds as per P&L 2.6, so the dead load test must be performed under 2,000 lbs.

Technical References: 3-SOP-CM-002
Proposed References to be provided: None

Learning Objective I3LP-ILO-FHD001 6

Question Source: New

Question History:

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012214 Equipment Control - Knowledge of the process for controlling equipment configuration changes or status.	
	Importance	3.9	4.3

Question # 68

Which of the following is considered a temporary modification required to be controlled by EN-DC-136, Temporary Modifications?

A. Temporary scaffolding is installed over a Safety Injection pump.

B. A circuit board is temporarily removed to support an electrical test.

C. A catch containment and drain hose which is routed to a floor drain.

D. A hose is run from the Unit 1 CST to the Unit 3 CST due to a contractor water purification trailer outage.

Answer: D

Explanation/Justification:

EN-DC-136 Temporary Modifications, Attachment 9.2 Part II- Exclusions.

A is incorrect as it is Exclusion 8.

B incorrect Exclusion 11.

C incorrect Exclusion 19

D correct.

Technical References:	EN-WM-104
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ADM01 1
Question Source:	New
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012222 Equipment Control - Knowledge of limiting conditions for operations and safety limits.	
	Importance	4	4.7

Question # 69

Given the following conditions:

- Unit 3 was operating at 100% power performing the quarterly rod movement testing when a single peripheral control rod dropped into the core.
- During the response to the dropped rod, the crew lowered reactor power to 75% to comply with the actions of LCO 3.1.4.a, Condition B.2.2.
- A QPTR performed after the power reduction indicates the highest quadrant power tilt is 1.03.

Which of the following identifies the <u>maximum</u> final reactor thermal power level the unit can be two hours later?

A. 49 %

B. 66 %

C. 72 %

D. 75 %

Answer: D

Explanation/Justification:

A is incorrect but plausible as the LCO is not applicable less than 50% power.

B is incorrect but plausible if the operator thinks that power must be reduced 3% for every 1% of QPTR >1.0 from CURRENT power level.

C is incorrect but plausible if operator thinks power reduction of 1% for every 1 % of deviation from CURRENT power.

D is correct, since the power reduction required due to QPTR deviation is 3% for every 1% of deviation from RATED THERMAL POWER, not CURRENT power, and the unit has already been lowered to 75% in response to the rod drop.

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

Learning Objective I3LP-ILO-ITS001 3

Question Source: New

Question History:

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#	1940012235 Equipment Control - Ability to determine Technical Specification Mode of Operation.	
	Importance	3.6	4.5

Question # 70

Given the following conditions:

- Unit 3 is performing a unit heatup and pressurization from Cold Shutdown.
- The unit enters MODE 4 at 1200 today and continues the heatup uninterrupted.

If the heatup is being performed at the Tech Spec MAXIMUM rate allowed, then when will the unit enter MODE 3?

Assume that the heatup rate is constant and all conditions are present which would allow an uninterrupted heatup.

A. 1330

B. 1430

C. 1500

D. 1800

Answer: A

Explanation/Justification:

TS limit for RCS heat up is 100°/hr.
To get from MODE 4 entry (200°F) to MODE 3 (350°) is 150 degrees.

Correct answer is 1.5 hours from 1200.

The max HUR per POP-1.1 is 50°F/hr IAW Attachment 5, RCS Heatup guidelines. This would take 3 hours from 1200.

There is a 60°F /hr heatup curve in TS 3.4.3 = 2.5 hours from 1200 (1430)

This question meets K/A by having to know both MODE 4 and MODE 3, as well as TS RCS H/U limit.

Technical References: 3-POP-1.1
Proposed References to be provided: None

Learning Objective I3LP-ILO-POP001 3

Question Source: New

Question History:

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#	1940012304 Radiological Controls - Knowledge of radiation exposure limits under normal and emergency conditions.	
	Importance	3.2	3.7

Question # 71

During a Declared Emergency at Indian Point requiring emergency response action.....

(1) What is the MINIMUM expected TEDE above which any IPEC worker SHALL be a volunteer

(2) Who must authorize that emergency exposure

A. (1) 5 REM
(2) Emergency Director or Emergency Plant Manager

B. (1) 25 REM
(2) Emergency Director or Emergency Plant Manager

C. (1) 5 REM
(2) Radiological Coordinator or Radiological Assessment Coordinator

D. (1) 25 REM
(2) Radiological Coordinator or Radiological Assessment Coordinator

Answer: A

Explanation/Justification:

EP-4-ALL, Rev. 3, page 3: IPEC ONLY "Any emergency response action requiring greater exposure than 10CFR20 limits should be limited to volunteers. Page 2 states that "All Emergency exposures in excess of 10CFR20 limits shall be authorized by the ED or EPM." Distracters are plausible based on 25 REM being emergency dose used, and authorizing agent used for other radiological functions.

Technical References:	EP-4-ALL OAP-032
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ERT005 14
Question Source:	New
Question History:	NA
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 12

Comments

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

Question # 72

Operators are responding to immediately isolate a reported radioactive leak in the charging pump area during a declared emergency.

Which of the following describes how radiation monitoring for those operators will be performed?

A. The operators will sign in to the General Area RWP on their way into the RCA.

B. A Radiation Technician will manually sign operators onto the required RWP then bring them dosimeters for dose of record recording.

C. The operators will take a dosimeter with them without signing on to a RWP. Their exposures will be recorded on the appropriate RWP as soon as possible.

D. The Radiation Technician who is already in the RCA will be directed to meet the operators at the leak site. Whatever dose the Radiation Technician receives will be manually input to the operators acquired dose.

Answer: C

Explanation/Justification:

EN-RP-105, Radiation Wotk Permits, step 5.1.4 states..."During emergencies which threaten personnel OR plant safety AND where immediate action is required, personnel may enter areas without being signed in on a RWP. In such cases, all exposures should be recorded on an appropriate RWP as soon as possible and the event documented on a condition report." This question hinges on knowing that during an emergency like the one stated in the stem that the action of isolating the leak is an immediate need.

A is incorrect but plausible as it is the normal expectation when entering the RCA.

B is incorrect but plausible based on it could be done but there is no action in procedure which allows it.

C is correct per above.

D is incorrect but plausible as it would give an approximate dose, but isn't an allowable action per procedure.

Technical References:	EN-RP-105 EN-RP-201
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ADM01 1
Question Source:	New
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 12

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#	3	
	Group#		
	K/A#	1940012409 Emergency Procedures/Plan - Knowledge of low power /shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	
	Importance	3.8	4.2

Question # 73

Given the following conditions:

- A RCS Cooldown is in progress in accordance with 3-POP-3.3, Plant Cooldown Hot to Cold Shutdown.
- RCS Temperature is 325°F.
- RCS Pressure is 350 psig.
- RCS is being cooled down using RHR.

A few minutes ago a Containment Area Rad monitor alarmed. The crew noted the following:

- PZR Level is lowering.
- Letdown has isolated.
- Charging flow is 125 gpm.

Which of the following procedure will be used to mitigate this event?

A. 3-AOP-RHR-1, Loss of RHR.

B. 3-AOP-AIR-1, Air Systems Malfunction.

C. 3-ONOP-RCS-8, LOCA in Mode 3 or 4 with Accumulators Isolated.

D. 3-AOP-LEAK-1, Sudden Increase in Reactor Coolant System Leakage.

Answer: C

Explanation/Justification:

A is incorrect but plausible, as the RHR pumps will require securing if PZR level continues to lower, however, the strategy that is required is to get PZR level stable or rising, not re-establishing cooling.

B is incorrect but plausible if it is thought that the loss of air has caused the letdown isolation and loss of PZR level.

C is correct, as it will secure RHR pumps before they are damaged, and attempt to initiate additional RCS makeup whether with charging or SI pumps.

D is incorrect but plausible as it would be the procedure to use if the reactor were in Modes 1-3 and a leak was trying to be located and isolated.

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Given the following initial conditions on Unit 1:
- MODE 3 operations were in progress after a normal shutdown and cooldown in accordance with all procedures.
- RCS Pressure was manually depressurized to 900 psig.
- RCS was being cooled down by dumping steam to the condenser at 50F per hr.
- SI Accumulators were ISOLATED as pressure was reduced below 1000 psig.

A few minutes ago a Containment Area Rad monitor alarmed. The crew noted the following:
- PZR Level is DECREASING.
- Letdown is ISOLATED.
- Charging flow is 150 gpm.

Actions to mitigate this situation are contained in . . .

Answer:
1BwOA S/D-2 SHUTDOWN LOCA.

Distract1:
1BwOA PRI-10 LOSS OF RH COOLING.

Distract2:
1BwOA PRI-1 EXCESSIVE PRIMARY PLANT LEAKAGE.

Distract3:
1BwOA SEC-4 LOSS OF INSTRUMENT AIR

A. Correct

B. Incorrect but plausible because this procedure could be entered, but it will not take actions.

C. Incorrect but plausible because RHR-1 has actions to go on recirc, but the entry conditions are not met

D. Incorrect but plausible because several of the indications could be caused by a loss of instrument air.

Technical References: 3-ONOP-RCS-8
Proposed References to be provided: None

Learning Objective I3LP-ILO-ONPRCS 1

Question Source: Bank

Question History:

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#	1940012421 Emergency Procedures/Plan - Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	
	Importance	4	4.6

Question # 74

Given the following conditions:

- A LBLOCA has occurred.
- All equipment responded as expected except no Containment Spray pumps started or can be started.
- The crew has just implemented the CFSTs.

Current conditions are:

- RCS pressure is 35 psig.
- RCS Tcolds are 360°
- Containment pressure is 34 psig.
- IR SUR is -0.2 dpm.
- All RCPs have been secured.
- RVLIS Full Range is 50%.

Which of the following procedures should be utilized first?

A. 3-FR-I.3, Response to Voids in Reactor Vessel.

B. 3-FR-C.2, Response to Degraded Core Cooling.

C. 3-FR-Z.1, Response to High Containment Pressure.

D. 3-FR-P.2, Response to Anticipated Thermal Shock Condition.

Answer: C

Explanation/Justification:

Core cooling CET<1200 and no subcooling due to loca. No RCP running, CETs < 715, then with all ECCS equip running to inject, RVLIS full range WILL be > 33%, is YELLOW path.

Inventory PZR level < 90%, <19% will be YELLOW path.

Thermal Shock Tc cooldown >100°, all RCS cold legs sat, GREEN path.

Containment with pressure <47>22, and no containment spray pumps running, ORANGE path.

Technical References: 3-F-0.5
Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPC00 1

Question Source: New

Question History:

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#	1940012426 Emergency Procedures/Plan - Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage.	
	Importance	3.1	3.6

Question # 75

Which of the following conditions will determine the need for requesting Offsite Assistance when responding to a fire in the plant in accordance with 3-ONOP-FP-1, Plant Fires?

A. The fire is in the Protected Area.

B. An automatic fire suppression system has activated.

C. Plant equipment is required to be secured due to the fire.

D. A fire is unable to be extinguished with hand held extinguishers.

Answer: B

Explanation/Justification:

Plant fire procedure has the fire brigade dispatched, then step 2 is a monitor step to see if offsite assistance is required.
A is incorrect because the proper area in outside the protected area, not inside.

B is correct per ONOP-FP-1, step 2.a, 5th bullet.

C is incorrect but plausible as there are sections of the procedure that deal with different areas and the equipment which may be affected and/or need to be secured.

D is incorrect because the fact that a hand help cannot extinguish is not cause for off site assistance.

Technical References:	3-ONOP-FP-1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-FPS001 8
Question Source:	New
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.41 (b) 10
Comments	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	000009A236 Ability to determine and interpret the following as they apply to a small break LOCA: - Difference between overcooling and LOCA indications	
	Importance	4.2	4.6

Question # 76

Given the following conditions:

- U3 was operating at 100% power when the reactor automatically tripped following a Main Generator fault.
- The crew has transitioned out of 3-E-0, Reactor Trip or Safety Injection with no SI required.
- The RO reports the following:
  - RCS Tavg: 547.6 °F and lowering slowly
  - Group 1 Steam Dump lamp lit, Groups 2-4 extinguished
  - RCS pressure: 1975 psig and lowering slowly
  - PZR level: 17.3% and lowering slowly
  - Total AFW flow: 425 gpm
  - SG NR levels: 1% and rising

Which of the following identifies what is occurring, and how the CRS should respond?

A. A SBLOCA is in progress. Initiate Safety Injection and return to 3-E-0.

B. A SBLOCA is in progress. Continue in 3-ES-0.1, Reactor Trip Response until RCS subcooling is <40°F, then initiate Safety Injection and return to 3-E-0.

C. An overcooling event is in progress. Close MSIVs and lower AFW flow to no less than 365 gpm, then return to 3-E-0.

D. An overcooling event is in progress. Continue in 3-ES-0.1, Reactor Trip Response to swap Steam Dumps to Pressure Control Mode, isolate SGBD, and lower AFW flow to no less than 365 gpm.

Answer: A

Explanation/Justification:

The indications presented in stem do not indicate overcooling based on Tavg being slightly above no load temp expected after a trip, also the steam dumps are operating correctly. Additionally, SG levels are rising with 425 gpm AFW flow, so this is not excess steam flow of a magnitude to cause excessive cooldown.

A is correct based on PZR level lowering uncontrollably, as letdown would have already isolated at 19%, removing 75 gpm, and PZR level continues to lower. Charging flow should be at max as controller responded to PZR level below program. Foldout page for 3-ES-0.1 states if PZR level cannot be maintained >5%, initiate SI and go to E-0.

B is incorrect but plausible as it has the correct event, but the wrong action. Subcooling is part of fold out sheet, but with pressure lowering at a slow rate, as based on RCS pressure in stem, PZR level action would occur much sooner than losing subcooling.

C and D are both incorrect based on the incorrect event.
C is plausible based on the actions which are part of E-0 step 1.b RNO 1.b.1 d.
D is plausible as part of the actions are E-ES-0.1 Step 1.b RNO b.1.b
16.0 Maintain – Interpretation as it applies to implied continuous action to "maintain" a level parameter:

- IF level is above the setpoint and you CANNOT maintain it above the setpoint, THEN you should take the contingency action specified.

Technical References:	3-ES-0.1 OAP-012
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPE00 x
Question Source:	New
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	000022A202 Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: - Charging pump problems	
	Importance	3.2	3.7

Question # 77

Given the following conditions:

- Unit 3 is operating at 100% power steady state.
- The RO reports the in service charging pump (32) discharge pressure fluctuating.
- Charging flow is oscillating between 30-70 gpm.
- Regenerative Heat Exchanger temps are fluctuating.
- 32 charging pump trips.

Which of the following describes the portion of 3-AOP-CVCS-1, Chemical and Volume Control System Malfunction, which should be used, and why?

A. Verify adequate VCT level and pressure then start 31 or 33 charging pump to restore seal injection and prevent having to perform a shutdown to MODE 5.

B. Verify adequate VCT level and pressure and dispatch an operator to shut 31-34 RCP Seal Injection FCVs to prevent having to trip the reactor when RCP seal inlet temperature exceeds 225°F.

C. Isolate letdown, manually start 31 or 33 charging pump at reduced speed, establish 6-12 gpm seal injection to each RCP, then restore normal letdown and charging to prevent having to perform a shutdown to MODE 5.

D. Isolate letdown, initiate Attachment 1, Charging and Letdown Restoration, and vent charging pump using 3-SOP-CVCS-002, Charging, Letdown, and Seal Injection to prevent having to trip the reactor when RCP seal inlet temperature exceeds 225°F.

Answer: D

Explanation/Justification:

Step 4.2 RNO to "Is a charging pump running?" will NOT start a charging pump based on the indications of gas binding, even with support conditions otherwise available (VCT pressure and level)
Without being able to start a charging pump, step 4.4 isolates letdown if a PZR bubble is established. Step 4.6/4.7 again checks for VCT availability with adequate level and its outlet valve open, but then checks for gas buildup or reg HX temp fluctuations before attempting to manually starts a CVCS pump at reduced speed to establish seal injection.
With charging and seal injection lost, the next step (4.29) isolates charging to RCS with HCV-142.
Operators are directed to Attachment 1 at step 4.39 which directs venting the charging pump at step 1.7 prior to attempting to restore a charging pump to service.

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

Learning Objective I3LP-ILO-AOPCVC 1

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	0000252404 Emergency Procedures/Plan - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	
	Importance	4.5	4.7

Question # 78

Given the following conditions:

- The unit is performing a plant cool down on RHR with 34 RCP operating.
- RCS Temperature is 275°F and lowering in accordance with cooldown rate selected.
- RCS Pressure Transmitter PT-403 fails HIGH.

What is the effect of the failure on the plant, and what initial actions are required to mitigate the failure?

A. Loss of suction flowpath from RCS to RHR. Enter 3-AOP-RHR-1, Loss of RHR, and initiate Attachment 6, RHR Suction Valve Closure, to re-open MOV-731.

B. Loss of suction flowpath from RCS to RHR. Enter 3-AOP-RHR-1, Loss of RHR, to stop the running RHR pump and establish secondary heat removal via the atmospheric or condenser steam dumps.

C. Loss of RCS coolant inventory through RHR HX outlet relief valve to PRT. Enter 3-AOP-LEAK-1, Sudden Increase in Reactor Coolant System Leakage, and shut RHR to CVCS Letdown line isolation valve HCV-133.

D. Loss of RCS coolant inventory through RHR HX outlet relief valve to PRT. Enter 3-AOP-LEAK-1, Sudden Increase in Reactor Coolant System Leakage, to stop running RHR pump and shut RHR Suction Valves MOV-730 and MOV-731.

Answer: B

Explanation/Justification:

PT-403 failing high will cause MOV-730 to shut on high pressure, isolating the RCS from RHR suction.
A is incorrect but plausible as Attachment 6 is for opening an inadvertently shut 730/731, but does not address if it is opened due to RCS pressure transmitter interlock, whether failed or not. The steps contained in Att 6 would not work since interlock would prevent opening valve.
B is correct, as the soon to be cavitating RHR pump is stopped. With no source of DHR, operators are instructed to use steam dumps or SG atmos releif valves to establish heat removal.
C and D are both incorrect but plausible if the operator thinks that the pressure transmitter failing high would cause a relief valve to open based on the high pressure. The action in C to attempt to isolate the relief valve would be ineffective as it is downstream of the affected relief.
D is additionally incorrect as the actions would effectively isolate the RHR system from losing inventory if the relief valve was open, but it is not.

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

Learning Objective I3LP-ILO-AOPRHR 1

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	0000382145 Conduct of Operations - Ability to identify and interpret diverse indications to validate the response of another indication.	
	Importance	4.3	4.3

Question # 79

Given the following conditions:

- Unit 3 was operating at 100% power when a tube leak developed on 31 SG.
- Prior to initiating a shutdown in 3-AOP-SG-1, Steam Generator Tube Leak, the crew manually tripped the reactor and initiated SI when PZR level could not be maintained.
- During performance of 3-E-0, 34 RCP tripped.
- When isolating feed flow to 31 SG in 3-E-3, Steam Generator Tube Rupture, the operator reports 34 SG NR level is higher than the ruptured SG.
- 32 and 33 SG WR levels are ~52% and rising slowly.

Which of the following identifies how the CRS should proceed?

A. Isolate 34 SG concurrently with 31 SG as directed in 3-E-3 then continue.

B. Finish isolating 31 SG, then return to Step 1 to address the tube rupture on 34 SG.

C. Continue in 3-E-3 while verifying no tube rupture exists in 34 SG by isolating AFW and monitoring SG level and rad monitors.

D. Continue in 3-E-3 until cooldown/depressurization are complete, then return to Step 1 to address the tube rupture on 34 SG.

Answer: C

Explanation/Justification:

Feed flow is not isolated until SG NR level is greater than 9%, so 34 SG has to be at least 9%. The RCP trip has resulted in reverse flow through that loop, and resulted in a higher NR level.

A is incorrect as the procedure has operators stabilize the plant then return to Step 1 if there were another SG with a rupture.

B is incorrect but plausible as it would be the correct answer if there was a tube rupture on another SG.

C is correct as the Foldout page states if a SG NR level is rising in an uncontrolled manner, which in this case it is not.

D is incorrect but plausible if another tube rupture occurred later in procedure.

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

Learning Objective I3LP-ILO-EOPC00 1

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	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 the following conditions:

- Unit 3 is operating at 30% power when an Instrument Air malfunction occurs.
- The crew enters 3-AOP-AIR, Air Systems Malfunction.
- Instrument air header pressure is 75 psig and lowering slowly.
- Letdown isolates, the CH-LCV-112B, RSWT to Charging Pump Suction LCV, fails to fully open when demanded, and VCT level lowers to <5%.
- No other AOVs have repositioned.

Which of the following describes how the CRS should proceed?

A. Direct a reactor trip, stop all RCPs, trip all charging pumps, then initiate E-0, Reactor Trip or Safety Injection while continuing in 3-AOP-AIR-1.

B. Direct a reactor trip and initiate E-0, Reactor Trip or Safety Injection, to stabilize the plant, then return to 3-AOP-AIR-1 to address the loss of instrument air.

C. Direct a Main Turbine trip, initiate 3-AOP-TURB-1, Main Turbine Trip without a Reactor Trip, trip all charging pumps, then return to 3-AOP-AIR-1 to address the loss of instrument air.

D. Direct a Main Turbine trip, initiate 3-AOP-TURB-1, Main Turbine Trip without a Reactor Trip, place rod control in manual, and establish manual control of SG level while continuing in 3-AOP-AIR-1.

Answer: A

Explanation/Justification:

A is correct because when VCT level lowers <5%, a reactor trip is directed per AOP-AIR-1 steps 4.10-4.15, 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 actions are wrong as other actions are performed in AOP-AIR in addition to reactor trip.

C is incorrect but plausible if the operator recognizes that power is below P-8 (35%) and thinks the reactor need not be tripped with a turbine trip only required, then actions of AOP-AIR are listed sans RCP trip, which would require a reactor trip.

D is incorrect but plausible as per C above, and additionally as it has the actions from AOP-TURB which would be correct for the turbine trip.

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

Learning Objective I3LP-ILO-AOPAIR 1

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		1
	K/A#	00WE052421 Emergency Procedures/Plan - Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	
	Importance	4	4.6

Question # 81

Given the following conditions:

- Unit 3 is operating at 100% power when both MFW pumps trip.
- The reactor fails to trip manually and automatically.
- All AFW pumps failed to start and cannot be started.
- The crew is performing actions of FR-S.1, Response to Nuclear Power Generation / ATWS.
- The Turbine is verified tripped.
- An operator has locally tripped the reactor.
- Reactor power is < 5%, a negative IR SUR exists, and all rods have been verified <20 steps while performing Step 7 of FR-S.1.
- All SG WR levels are 41% and lowering.

Which one of the following describes how the CRS should respond?

A. Complete all required actions in FR-S.1, then transition to FR-H.1, Response to Loss of Secondary Heat Sink.

B. Immediately suspend FR-S.1, and return to E-0 at step 1. Transition to ES-0.1 Reactor Trip Response when directed by E-0.

C. Complete all required actions in FR-S.1, then return to E-0, Reactor Trip or Safety Injection at step 1. Transition to FR-H.1, when directed at Step 20.

D. Immediately suspend FR-S.1 and then enter FR-H.1, Response to Loss of Secondary Heat Sink, since the RED path present for Loss of Heat Sink is a higher priority than the now GREEN status for Subcriticality.

Answer: A

Explanation/Justification:

Duplicated from question no 17388
OAP-12 EOP Users Guide. Step 4.3.14.
All actions must be completed in FR-S.1 even though actions taken may have eliminated the nuclear power generation.
With FR-S.1 completed, FRPs are active because of the transition out of E-0 earlier. The RED path for heat sink now become the priority over other procedures.
Returning to E-0 would be indicated if there were no orange or red path CFST in effect. The normal earliest transition to heat Sink would be at Step 20, since FRPs are not in effect.
Modified distracters, but correct answer remains correct.

Technical References:	2-FR-H.1 2-FR-H.1 BG 2-FR-S.1 2-FR-S.2 BG 3-FR-H.1 3-FR-S.1 OAP-012
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPFRH 1
Question Source:	Modified
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	0000052107 Conduct of Operations - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	
	Importance	4.4	4.7

Question # 82

Given the following conditions:

- Unit 3 is operating at 90% power.
- 33 Condensate pump is O/S.

Subsequently, 31 Heater Drain pump trips.

- The CRS orders a load reduction to 550 MWe in accordance with 3-AOP-FW-1, Loss of Feedwater to maintain MBFP suction pressure.
- During the load reduction, the RO reports a single control bank D rod has not moved and indicates 212 steps.
- The Group Demand Counter and all other D bank rods indicate 202 steps.
- Turbine load is 905 MWe and lowering.
- Reactor Power is 86% and lowering.
- MBFP suction pressure is 305 psig and lowering.

Which of the following describes how the CRS should proceed?

A. Initiate 3-AOP-ROD-1 while continuing the load reduction in 3-AOP-FW-1, Loss of Feedwater. Use auto rod control until deviation exceeds 12 steps.

B. Stop the load reduction and initiate 3-AOP-ROD-1, Rod Control and Indication Systems Malfunction. Place rod control in manual and determine tripability of affected rod.

C. Initiate 3-AOP-ROD-1 while continuing the load reduction in 3-AOP-FW-1, Loss of Feedwater. Place control rods in manual and raise the boration rate to maintain Tavg within 1.5°F of Tref.

D. Stop the load reduction and initiate 3-AOP-ROD-1, Rod Control and Indication Systems Malfunction. Within one hour either restore the affected rod to within allowable deviation or determine SDM, and reduce RTP to $\leq$ 75% within two hours.

Answer: C

Explanation/Justification:

A is incorrect because with a rod stuck at full out, any further rod motion will exacerbate any flux deviation in the core. Rods are placed in manual IAW ROD-1 regardless of the deviation.

B is incorrect because the load reduction would not be stopped with MBFP suction pressure low and continuing to lower. The max load IAW AOP-FW-1, Attachment 1, with 1 HDP O/S is 700 Mwe, so the suction pressure will continue to degrade if the load reduction is stopped. The action to place rod control in manual and determine rod status is correct.

C is correct, because it is how AOP-ROD-1 directs any required load reduction to be performed.

D is incorrect because the load reduction would not be stopped, but plausible as the Tech Spec required actions for a rod outside the allowable deviation are included in answer. Even so, the current deviation is not outside the allowed.

Technical References: 3-AOP-FW-1
3-AOP-ROD-1

Proposed References to be provided: None

Learning Objective I3LP-ILO-AOPROD 1

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	0000322225 Equipment Control - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	
	Importance	3.2	4.2

Question # 83

Given the following conditions:

- Unit 3 is performing a reactor startup using 3-POP-1.2, Reactor Startup.
- Reactor Trip Breakers are shut.
- All Shutdown Bank control rods have been withdrawn.
- The crew is preparing to commence Control Bank A withdrawal.

Subsequently, Source Range NI Channel I fails low.

Which of the following describes how the CRS should proceed IAW Tech Specs, and the bases for that action?

A. The startup must be terminated by immediately opening the Reactor Trip breakers because single failure criteria are not met for a reactor trip protective function.

B. The startup may continue. The Source Range High Flux trip is redundant to the Power Range Neutron Flux – Low trip, and either of the two Source Range channels can provide that redundancy.

C. The startup may continue. The Source Range High Flux trip is redundant to the Intermediate Range Neutron Flux trip, and either of the two Source Range channels can provide that redundancy.

D. The startup must be terminated by manually inserting all control rods then opening the reactor trip breakers within one hour to ensure the Rod Control System is placed in a condition in which rod withdrawal is prevented in a timely manner.

Answer: B

Explanation/Justification:

Tech Spec 3.3.1 only requires a single channel of SR instrumentation in Mode 2. Per the bases, its provides a redundant trip to back up high flux low range. Additionally, there is no action in AOP-NIS for a single channel of SR NI inoperable except in Mode 6 which is NA to this question.

A is wrong but plausible because the action is correct if NO SR channels are operable.

B is correct.

C is incorrect but plausible as it specifies redundancy to IR NI flux trip.

D is incorrect but plausible if the operator believes inserting control rods and opening RTBs is a one hour action time.

Technical References:	3-AOP-NI-1 Tech Specs
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-AOPNI1 1
Question Source:	New
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 2

Comments

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

Question # 84

Given the following conditions:

- A small break LOCA occurred
- The reactor was tripped and SI initiated
- Offsite power was lost following generator trip
- 33 EDG failed to start
- The team transitioned to ES-1.2, Post LOCA Cooldown and Depressurization
- The cooldown was initiated

Subsequently, the NPO reports that 33 EDG has been successfully started and loaded on bus 5A.

Which of the following describes the correct actions regarding MCCs on bus 5A?

MCCs on bus 5A are:

A. Aligned and reset using 3-SOP-EL-001, Diesel Generator Operation.

B. Reset without alignment using 3-SOP-EL-001, Diesel Generator Operation.

C. Aligned and reset using 3-SOP-EL-015, Operation of Non-Safeguards Equipment during use of EOPs.

D. Reset without alignment using 3-SOP-EL-015, Operation of Non-Safeguards Equipment during use of EOPs.

Answer: C

Explanation/Justification:

There are several attachments in EL-15 to reset, and where required, align MCCs, depending on whether they remain powered from offsite power or the EDGs. In general, alignment is required when the EDG is powering the bus. It is not for offsite powered bus. This question meets the criteria for being SRO based upon the required knowledge of what section of ES-1.2 to use, in this case the CAS on page 2, and knowing that it is a CAS and will be performed even though operators are currently deeper in the procedure. Also, know which attachment to use in EL-005. The attachment names are specifically left out of the choices, as they would cue which was the correct one.

Technical References:	3-ES-1.2 3-SOP-EL-015
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPS10 3
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		1
	Group#		2
	K/A#	00WE08A201 Ability to determine and interpret the following as they apply to the Pressurized Thermal Shock: - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	
	Importance	3.4	4.2

Question # 85

Given the following conditions:

- The unit was operating at 100% power EOL when a Main Steamline break occurred in the turbine hall.
- 31, 33, and 34 MSIVs failed to shut.

25 minutes after the break conditions are:

- RCS Pressure is 340 psig and lowering
- RCS Tcolds are 239°F and lowering
- IR NI SUR is +0.1 dpm and stable
- Containment Pressure is 16 psig and lowering
- RCPs are secured
- All SI System Pumps are running
- No RHR Flow is indicated
- RWST level is 20 feet
- The crew has transitioned out of E-0, Reactor Trip or Safety Injection

Which of the following describes how the CRS should proceed?

A. Enter 3-FR-S.1, Response to Nuclear Power Generation. Ensure AFW flow is > 686 gpm and initiate emergency boration of RCS.

B. Enter 3-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition. Check RCS pressure and return to procedure and step in effect.

C. Enter 3-FR-S.1, Response to Nuclear Power Generation. Manually energize SR detectors and transfer highest reading source range to NIS N-45 recorder.

D. Enter 3-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition. Isolate feed flow to 31, 33, and 34 SGs, continue feeding 32 SG until NR level is >14%.

Answer: D

Explanation/Justification:

With the stem condition of having exited E-0, CFSTs are in effect.

A is incorrect but plausible based on knowing that the positive IR SUR is an ORANGE path vs a RED path, but the actions are correct for the RED path.

B is incorrect but plausible as it is the correct procedure but the wrong action, as there is no RHR flow, which would have kicked out to procedure step in effect.

C is incorrect because it is wrong procedure, but correct actions for the ORANGE path FR-S.

D is correct because it is correct procedure based on being less than 290°F which would always warrant entry in Thermal Shock, and the steps to minimize RCS cooldown while still maintaining a heat sink in intact SG.

Technical References:	2-FR-P.1 3-FR-P.1 3-FR-S.1
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-EOPFRP 1
Question Source:	New
Question History:	NA
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	006000A202 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of flow path	
	Importance	3.9	4.3

Question # 86

Given the following conditions:

- While operating at 100% power, a LBLOCA occurred.
- During performance of ES-1.3, Transfer to Cold Leg Recirculation, Recirc SW No. 4 failed to align its valves, and they cannot be re-positioned.

Which of the following describes the effect of this failure, and how should the CRS proceed?

A. Recirculation pump discharge flow will be zero. Go to Attachment 3, Alignment of RHR for Recirculation to establish one RHR pump in service from the containment sump.

B. Recirculation pump discharge flow will be zero. Go to Attachment 4, Establishing HHSI Recirculation – Inadequate Low Head flow, to align two HHSI pumps suction to RHR pump discharge.

C. Recirculation pump discharge flow will be established, but < 360 gpm. Go to Attachment 3, Alignment of RHR for Recirculation to establish one RHR pump in service from the containment sump.

D. Recirculation pump discharge flow will be established, but < 360 gpm. Go to Attachment 4, Establishing HHSI Recirculation – Inadequate Low Head flow, to align two HHSI pumps suction to RHR pump discharge.

Answer: A

Explanation/Justification:

The failure of Recirc SW No. 4 will mean the Recirc pump discharge valves 1802A and 1802B will remain shut, and recirc flow will be zero. This question is SRO level because the system knowledge will only allow the SRO to identify the effect on the ECCS flow path from the failure, then selecting a portion of the procedure which needs to be implemented because of that failure.

A is correct because flow will be zero, and step 10.e.2 RNO states if neither valve can be opened, GO TO Attachment 3.

B is incorrect but plausible since if minimum recirc flow of 360 gpm cannot be met at step 11, the required action is to go to Attachment 4. However, the operator will not reach step 11, as neither recirc discharge valve was opened in step 10.

C and D are both incorrect but plausible since the two attachments are performed in ES-1.3 when some type of recirc flow cannot be established as noted above. Plausibility is maintained when the operator is unsure of the affected flowpath and the effect of the failed switch.

Technical References: 3-ES-1.3
Proposed References to be provided: None

Learning Objective I3LP-ILO-EOPS10 3

Question Source: New

Question History: NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	1940012221 Equipment Control - Knowledge of pre- and post-maintenance operability requirements.	
	Importance	2.9	4.1

Question # 87

Given the following conditions:

- Unit 3 has just entered MODE 4 descending, where it will remain for the remainder of this shift.
- 3-PT-Q117A, 31 Containment Spray Pump Functional Test, is scheduled to be performed this shift.

Which of the following identifies:

1) The Tech Spec required actions, if any, for performing this test

2) The post-test required actions, if any, following successful performance of this test

A. 1) Enter LCO 3.6.6.A for one of the two required Containment Spray Trains being inoperable.
   2) No retest is required, as the test itself is proving operability, and the CRS may exit LCO 3.6.6.A.

B. 1) Enter LCO 3.6.6.A for one of the two required Containment Spray Trains being inoperable.
   2) 3-PT-M096, Containment Spray System Monthly Alignment Verification will be performed, then the CRS may exit LCO 3.6.6.A.

C. 1) Entry into LCO 3.6.6.A is NOT required as long as other Containment Spray Train is operable.
   2) No retest is required, as the test itself is proving operability, and the CRS may exit LCO 3.6.6.A.

D. 1) Entry into LCO 3.6.6.A is NOT required as long as other Containment Spray Train is operable.

2) 3-PT-M096, Containment Spray System Monthly Alignment Verification will be performed, then the CRS may exit LCO 3.6.6.A.

Answer: A

Explanation/Justification:

A is correct because TWO Containment Spray trains are required to be operable in MODES 1-4. Entry into LCO 3.6.6.a IS required. The Functional Test proves operability, and the procedure directs the CRS that they may exit the LCO upon its SAT performance, so no other retest is required.

B is incorrect but plausible if the operator thinks the valve lineup must be performed to ensure operability.

C and D are incorrect but plausible if the operator thinks the requirement for operable CS trains lowers from 1 to 2 upon entry into MODE 4, and D also includes the valve lineup.

This question meets the K/A for pre and post maintenance requirements in knowing when the TS is applicable, and then knowing that the test itself is proving operability so no other unnecessary operations have to be performed.

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

Learning Objective I3LP-ILO-CS001 6

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		1
	K/A#	061000A207 Ability to (a) predict the impacts of the following malfunctions or operations on the AFW System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Air or MOV failure	
	Importance	3.4	3.5

Question # 88

Given the following conditions:

- Unit 3 is in MODE 3 five minutes following a reactor trip from full power.
- 31 and 33 AFW pumps are in service.
- 32 AFW pump is not available.
- All SG WR levels are ~52% and rising slowly.

Subsequently, PT-406A, 31 AFW pump discharge pressure transmitter fails LOW.

Which of the following describes the effect of this failure, and how should the CRS proceed?

31 and 32 SG WR levels will ___(1)___ . The CRS should ___(2)___ .

A. (1) lower
(2) initiate FR-H.1, Loss of Secondary Heat Sink based on <365 gpm AFW flow with <9% SG NR level, and transition from 3-E-0 has occurred.

B. (1) lower
(2) direct the RO to maintain AFW flow to 33 and 34 SGs >365 gpm total until at least one SG NR level is >9% in accordance with Continuous Action Step 1 of 3-ES-0.1, Reactor Trip Response.

C. (1) rise faster
(2) initiate 3-AOP-INST-1, Instrument / Controller Failures in parallel with 3-ES-0.1, Reactor Trip Response.

D. (1) rise faster
(2) direct the RO to lower AFW flow to 33 and 34 SGs in accordance with Continuous Action Step 1 of 3-ES-0.1, Reactor Trip Response.

Answer: B

Explanation/Justification:

This is a K/A match based upon the Feed Reg Valves 406A and 406B going full shut on the failure of the pressure transmitter.

The PT-406A pressure transmitter senses AFW pump discharge pressure, and if pressure is less than 1350 the Cutback Controller output rises to lower flow and raise pressure. Since the Cutback controller is seeing zero discharge pressure, its output will increase to max and shut the FCV406A and B. This will have no effect on 33 AFW pump or its FCV's, which would still be full open this early in the trip response. Affected (31 and 32) SGs will continue to steam with no AFW flow, and NR level will lower. 33 AFW pump will already be supplying >365 gpm, and must continue to do so until 33 or 34 SG NR level is >9%.

A is incorrect but plausible if the operator know CFSTs are in effect with the transition out of E-0, and thinks total AFW flow will be <365 gpm with no operator action.

B is correct, as the continuious action step 1 in ES-0.1 directs its performance until transition out of procedure.

C and D are both incorrect as SG level will not rise.

C is incorrect also as AOP-INST-1 does not cover AFW pump discharge pressure transmitter failure.

D is additionally incorrect as flow won't be lowered to 33,34 SGs but is plausible if the operator diagnoses the failure in the incorrect direction.

This is SRO level since the CRS must determine the action from a section of the procedure in use, and which procedure to use or not use.

Technical References: 3-ES-0.1
Proposed References to be provided: None

Learning Objective I3LP-ILO-AFW001 6

Question Source: New

Question History:

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#	0640002236 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 # 89

Given the following conditions:

- Unit 3 is operating at 100 % power.
- 33 EDG is out of service for preventative maintenance with an estimated return to service in 24 hours.

While reviewing the schedule for your oncoming shift, you notice 33 SI pump is scheduled for a motor resistance check. The estimated completion time for the work is 2 hours.

Which of the following identifies if you should approve 33 SI pump to be taken out of service as scheduled, and why/why not?

A. Approve. Technical Specifications allow one SI pump to be out of service for up to 72 hours provided the remaining pumps are demonstrated operable.

B. Approve. Technical Specification allow one SI pump to be out of service, for up to 24 hours provided the remaining pumps are demonstrated operable.

C. Do NOT approve. Technical Specifications requires all 3 SI pumps with their associated piping and valves to be operable if any EDG is inoperable.

D. Do NOT approve. Technical Specifications state that if one EDG is out of service then the other 2 EDGs and their associated safeguards equipment shall be maintained operable.

Answer: D

Explanation/Justification:

Editorially modified 26636 to make U3 question and make position specific
LCO 3.5.2 does not apply with 2 HHSI pumps inoperable and would cause 3.0.3 to be entered.

A. Incorrect. Plausible because a single SI Pump may be inoperable for 72 hours, however, with 33 EDG OOS this would make 31 SI inoperable also.

B. Incorrect. Plausible because the 24 hour allowable time is used in Tech Specs

C. Incorrect. Plausible because 31 SI pump need not be declared inoperable simply because its EDG is inoperable. When a supported system LCO is not met solely due to a support system LCO not being met, the Conditions and Required Actions associated with this supported system are not required to be entered. If a loss of safety function is determined to exist by this program, the pump should be declared inoperable.

D. Correct.

Technical References:	Tech Specs
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ITS001 1
Question Source:	Bank
Question History:	IPEC Unit 3 2013
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b)3

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 # 90

Given the following conditions:

- Unit 3 is performing a plant heatup and pressurization using 3-POP-1.1, Plant Heatup from Cold Shutdown.
- RCS pressure is 1200 psig and rising slowly under control.
- RCS temp is 410°F and rising slowly under control.

If a 2/2 Containment Hi-Hi Pressure signal inadvertently occurs, what effect would this have on Containment Isolation signals, and how should the CRS respond?

A. Auto SI, Phase A, Phase B, and Containment Spray will ALL occur. The CRS will use AOP-RCP-1, Reactor Coolant Pump Malfunctions, to reset Phase B and establish CCW flow to RCPs, and use ARPs to reset SI, Phase A, and Containment Spray.

B. Auto SI, Phase A, Phase B, and Containment Spray will ALL occur. The CRS will initiate 3-E-0, Reactor Trip or Safety Injection, and use the Foldout page to place SI pumps in TRIP PULLOUT, then continue in 3-E-0 until directed to transition to 3-ES-1.1, Safety Injection Termination.

C. Auto SI has not been unblocked so no Phase A isolation will occur. Phase B isolation and Containment Spray WILL occur. The CRS will use AOP-RCP-1, Reactor Coolant Pump Malfunctions, to reset Phase B and establish CCW flow to RCPs, and use ARPs to reset Containment Spray.

D. Auto SI has not been unblocked so no Phase A isolation will occur. Phase B isolation WILL occur. The CRS will initiate 3-E-0, Reactor Trip or Safety Injection, and use the

Foldout page to place CS pumps in TRIP PULLOUT, then continue in 3-E-0 until directed to transition to 3-ES-1.1, Safety Injection Termination.

Answer: B

Explanation/Justification:

To be where the crew is at in POP-1.1, the RTBs have been cycled, and Auto SI (except for PZR low pressure) have been unblocked. The 2/2 Hi-Hi containment pressure signal will initiate Containment Spray, SI, Phase A and Phase B. With the unit in MODE 3 per stem conditions, the EOP network is in effect. The CRS will respond to this inadvertent SI/CS initiation IAW EOPs to secure all the SI/CS equipment. This is SRO level based on knowing what section of what procedure (E-0) foldout page, and knowing the EOPs are in effect in MODE 3 even though the RTBs are open and unit is not at NOP/NOT.

A is incorrect but plausible as it has the correct actuations, but the wrong procedures to address it.

B is correct as per above.

C is incorrect but plausible as it has correct actuations

D is incorrect as auto SI has been unblocked, but plausible as it includes actuations which will occur.

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

Learning Objective I3LP-ILO-VCCIS 3

Question Source: New

Question History:

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#	0020002240 Equipment Control - Ability to apply technical specifications for a system.	
	Importance	3.4	4.7

Question # 91

Given the following conditions:

- Unit 3 is in MODE 3.
- RCS pressure is 1200 psig.
- RCS Thots are 385°F.
- 34 RCP is in service.
- RCS boron concentration is 1500 ppm and stable.
- 31 and 33 SGs are undergoing fill and drain cycles to reduce chemical impurities.
- 31 and 33 SG WR levels are currently 75%.
- 34 SG NR level is 40%.
- Due to AFW flow control problems, 32 SG NR level is 5%.
- 31 RDMG set motor is in service to allow testing.
- All Reactor Trip Breakers are open.

In accordance with Tech Specs, which of the following contains BOTH a condition which would require having to enter LCO 3.4.5, RCS Loops – MODE 3, AND the correct bases for that entry?

A. Diluting the RCS 100 ppm. With less than ALL RCS loops in operation, uniform boron concentration distribution cannot be ensured.

B. 34 RCP trips. Having NO RCS loop in operation cannot ensure the accident analyses limits are met for uncontrolled rod withdrawal from subcritical condition.

C. Draining 31 and 33 SGs to 45% WR level. One operable RCS loop in operation to remove decay heat and ensure homogenous boron concentration throughout the RCS does not satisfy single failure criteria.

D. Closing RTBs to perform single rod testing. With less than ALL RCS loops operable and two RCS loops in operation, the accident analyses limits for uncontrolled rod withdrawal from subcritical condition cannot be ensured.

Answer: C

Explanation/Justification:

A is wrong because diluting RCS is only a concern with NO RCPs in operation, with correct bases.

B is incorrect because with RTB open there can be no uncontrolled rod withdrawal. Still in LCO for less than one RC loop in operation, wrong bases.

C is correct because 3 loops are inoperable, and bases is correct.

D is wrong because in Mode 3 all RC loops are not required to be in operation, just 2, with correct bases.

Technical References:	Tech Specs
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RCS001 10
Question Source:	New
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 2

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		2
	Group#		2
	K/A#	035000A204 Ability to (a) predict the impacts of the following malfunctions or operations on the S/GS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Steam flow/feed mismatch	
	Importance	3.6	3.8

Question # 92

Given the following initial conditions:

- Reactor power is 90% steady state.
- RCS Tave is 563°F and stable.

Final conditions:

- Reactor power is 90%.
- RCS Tave is stable at 566°F on ALL 4 loops.
- RCS pressure is stable at 2240 psig.
- Containment Pressure is stable.
- 33 SG Feed Flow indication is pegged high.
- 33 SG Main FW Reg Valve is full open.
- 33 SG pressure is stable.
- 33 SG level is lowering.

Which of the following events is in progress, and how should the CRS respond?

A. Steam Break on 33 main steamline outside containment. . Initiate 3-AOP-UC-1, Uncontrolled Cooldown, trip the reactor and go to 3-E-0, Reactor Trip or Safety Injection.

B. Steam Break on 33 main steamline outside containment. Initiate 3-AOP-UC-1, Uncontrolled Cooldown, trip the reactor, shut all MSIVs, go to 3-E-0, Reactor Trip or Safety Injection.

C. Feed Line Break on 33 main feedline outside Containment. Initiate 3-AOP-FW-1, Loss of Feedwater, trip the reactor, isolate MBFP discharge, go to 3-E-0, Reactor Trip or Safety Injection.

D. Feed Line Break on 33 main feedline outside Containment. Initiate 3-AOP-FW-1, Loss of Feedwater, trip the reactor, isolate MBFP discharge, trip all condensate and heater drain pumps, go to 3-E-0, Reactor Trip or Safety Injection.

Answer: C

Explanation/Justification:

This question is a K/A match based on interpreting SG conditions to distinguish between a feedline break and a steamline break.

A and B are incorrect because indications do not support a steamline break based on reactor power the same and tavg rising vs lowering, as well as incomplete action for UC.

B is incorrect for same reason as A above, but its actions for UC are complete.

C is correct based on a feedline break downstream of FE-438, causing FRV to open fully to try and recover SG level which is lowering. Actions are correct per AOP-FW.

D is incorrect as the indications do not present the leak being on the suction piping of the MBFP, therefore condensate and heater drain pumps do not require trip.

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

Learning Objective

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#	068000A204 Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Failure of automatic isolation	
	Importance	3.3	3.3

Question # 93

Given the following conditions:

- The plant is operating at 100% power steady state.
- A liquid release of 31 Monitor Tank is in progress IAW 3-SOP-WDS-014, Liquid Waste Releases.
- The following annunciators are received in the Control Room
  - CHANNEL FAILURE
  - R-18 LIQ. EFF
- The liquid release remains in progress.

Which of the following describes effect on the plant and the actions required?

A. The discharge should have automatically stopped. Stop the discharge, swap R-18 monitor to Channel 2, then re-open WD-RCV-018, Waste Condensate Discharge to River.

B. The discharge should have automatically stopped. Stop the discharge and direct Chemistry to sample the tank and refer to IP-SMM-CY-001, Radioactive Effluents Control, for further actions.

C. The radiation monitor has failed, but this type of failure is not designed to secure the release automatically. Request that HP recheck calculations and provide recommendations on action to be taken.

D. The radiation monitor has failed, but this type of failure is not designed to secure the release automatically. Direct Chemistry to sample the tank and refer to IP-SMM-CY-001, Radioactive Effluents Control, for further actions.

Answer: B

Explanation/Justification:

A. Incorrect but plausible since the auto action is correct, but using R-18 channel 2 is prohibited in 3-SOP-WDS-014

B. Correct per SOP

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

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

Technical References:	3-ONOP-RM-1 3-SOP-WDS-014
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-RMSPRM E
Question Source:	Bank
Question History:	2013 IP3
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#	1940012135 Conduct of Operations - Knowledge of SRO fuel handling responsibilities.	
	Importance	2.2	3.9

Question # 94

In accordance with 3-REF-001-GEN, Refueling Administration, the Refueling Senior Reactor Operator shall be present and in a location which allows direct observation of the following refueling activities EXCEPT:

A. Control rod latching.

B. Detensioning the RV head.

C. Any movement of the RV head.

D. Any movement of the Upper or Lower Internals.

Answer: B

Explanation/Justification:

Duties and Responsibilities of RSRO, found in 3-REF-001-GEN, Refueling Administration, Section 14.1.2, Refueling Senior Reactor Operator, subsection F, states the conditions which require the presence of RSRO. The only choice not listed is detensioning the head, which is plausible based on MODE 6 is entered with any head bolt not fully tensioned.

Technical References: OAP-029
Proposed References to be provided: None

Learning Objective I3LP-ILO-FHD001 1

Question Source: New

Question History:

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012140 Conduct of Operations - Knowledge of refueling administrative requirements.	
	Importance	2.8	3.9

Question # 95

While entering a refueling outage, the reactor trip breakers are opened at 2000 on April 1st.

Which of the following is the <u>soonest</u> movement of irradiated fuel assemblies may occur?

Assume all other conditions which must be met to move fuel are met.

A. 2000 April 4th

B. 0800 April 5th

C. 0800 April 7th

D. 2000 April 8th

Answer: B

Explanation/Justification:

Minimum time to be subcritical is 84 hours. This is found in Tech Spec Bases 3.9.6 for refueling cavity water level, as well as in the UFSAR Chapter 9 for Spent Fuel Pool Cooling, and Section 14.2 Accident Analysis for a Fuel Handling Accident.
The 72 and 168 hour distracters (A and D), are common Tech Spec Action Times. The remaining distracter of 96 hours is for continuity.

Technical References:	FSAR Tech Specs
Proposed References to be provided:	None
Learning Objective	I3LP-ILO-POP003 9
Question Source:	New
Question History:	
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012217 Equipment Control - Equipment Control - Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.	
	Importance	2.6	3.8

Question # 96

A Condition Report (CR) has been initiated concerning high vibration on THCC water pump 31.

Engineering has recommended immediately securing the pump.

Per EN-OP-104, Operability Determinations, what Operability Code should be assigned to the initial screening of this CR in PCRS?

A. ADMIN-NA

B. INOPERABLE

C. NOT REQUIRED

D. OPERABLE-OP EVAL

Answer: C

Explanation/Justification:

A is incorrect as it is associated with administrative documentation/procedure vio;ation and is NOT equipment related.

B is incorrect because the THCC water system is not a TS-SSC.

C is correct because the THCC system is not TS-SSC, nor does it require a Functionality Assessment based on not falling under the scope as per EN-OP-104 5.1.5, page 17 of 91.

D is incorrect because it is a condition where a TS SSC is operable and an Op Eval is required if cuurent and future operability could be maintained or enhanced through the use of comp measures or if additional info is available or needed.

Technical References: EN-OP-104
Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History:

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#	1940012238 Equipment Control - Knowledge of conditions and limitations in the facility license.	
	Importance	3.6	4.5

Question # 97

With Unit 3 operating at 100% power, a condition has developed in which less than two required smoke detectors in the area of 31 RCP are functional.

Which of the following describes the required compensatory measures which must be implemented?

A. A four hour fire watch tour shall be established within eight hours.

B. An hourly fire watch tour shall be established within one hour to inspect the affected location.

C. A continuous firewatch with backup fire protection equipment labeled accordingly shall be established within one hour.

D. A once per shift fire watch tour shall be established within eight hours to inspect the affected location <u>OR</u> Containment temperature is monitored at least once per hour.

Answer: D

Explanation/Justification:

This is SRO level based on ES-401, Attachment 2, page 19, II.A second bullet.
SAO-703, in Addendum I, FP/ASSS, identifies fire detection equipment, listed in Table I-1 and I-2 required to be functional. Table I-1 Fire Protection Instruments, lists Fire Zones 70A and 71A, in containment, as RCPs, and required number of instruments as 2 per RCP. Stem stated that there was less than 2.
Required compensatory measure as listed on page 1 of 23 of Addendum 1, states that for inside containment, there is an option to either establish a once per shift fire watch within 8 hours, or monitor containment temp once per hour.
All the distracters are compensatory actions listed in Addendum I for other locations and areas.

Technical References: 3-ONOP-FP-1
Proposed References to be provided: None

Learning Objective I3LP-ILO-FPS001 4

Question Source: New

Question History:

Question Cognitive Level: Fundamental Knowledge

10 CRF Part 55 Content: 55.43 (b) 1

Comments

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

Question # 98

Which of the following actions is required if R-27, Unit 3 Plant Vent Noble Gas Monitor, is determined to have a non-conservative setpoint during a release from the Gaseous Waste System?

A. Continue with the release and monitor the release using R-14, Plant Vent Monitor.

B. Continue with the release and perform two independent samples once an hour for the duration of the release.

C. Suspend the release and complete the actions to reset monitor's setpoint prior to continuing with the release.

D. Suspend 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. R-43 is a particulate and iodine monitor. It will not provide adequate monitoring for a release of the gas decay tanks.

B. SOP WDS-013, Gas Decay Tank Gaseous Releases, Section 2.1.1 states the release must be suspended if any radiation monitor, whose operability was assumed in the preparation of the release permit, becomes inoperable.

C. Termination of the release and completing the actions for an inoperable monitor prior to continuing with the release is required by SOP.

D. Termination of the release is required by SOP 5 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:	3-SOP-WDS-002 3-SOP-WDS-013
Proposed References to be provided:	None
Learning Objective	I0WKB-ILO-ADM00 2.3.7
Question Source:	Bank
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.43 (b) 4

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier#		3
	Group#		
	K/A#	1940012441 Emergency Procedures/Plan - Knowledge of the emergency action level thresholds and classifications.	
	Importance	2.9	4.6

Question # 99

Which of the following events, by itself, would require the most severe EAL classification?

A. Large Break LOCA.

B. ATWS and reactor remains > 5% power.

C. Fire in PAB not extinguished within 15 minutes.

D. Complete loss of all offsite power >15 minutes.

Answer: B

Explanation/Justification:

Loss of all offsite power < 15 minutes is UE SU1.1
LBLOCA - Alert based on loss of RCS barrier
Fire in Table H-1 area >15 minutes UE
ATWS SAE.

Technical References:	IP-EP-120
Proposed References to be provided:	None
Learning Objective	I0LP-ILO-ADM01 1
Question Source:	New
Question History:	
Question Cognitive Level:	Fundamental Knowledge
10 CRF Part 55 Content:	55.43 (b) 5

Comments

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

Question # 100

Given the following conditions and IP-EP-120 Fission Product Barriers:

- The crew was performing a shutdown due to a 15 gpm SGTL when a LBLOCA with multiple system failures occurred.
- R-25 and R-26 containment rad monitors are both reading 10 R/hr.
- NO AFW pumps are running.
- All SG NR levels are 0%.
- The ruptured SG atmospheric relief is stuck 25% open and cannot be isolated.
- Containment pressure is 22 psig and lowering.
- Transfer to Cold Leg Recirc is complete.

Based on the conditions, which of the following identifies the Emergency Classification and Protective Action Recommendation (PAR), if any, that is required?

Assume no other CFST RED conditions are present.

A. Site Area Emergency. No PAR is made.

B. General Emergency. PAR is ALWAYS made.

C. Site Area Emergency. PAR is made ONLY if conditions indicate a Rapidly Progressing Severe Accident.

D. General Emergency. PAR is made ONLY if conditions indicate a Rapidly Progressing Severe Accident.

Answer: A

Explanation/Justification:

Using the Fission Product Barrier Table, the R25/26 radiation level remains below any containment or fission product loss or potential loss. The SGTR and stuck open atmospheric relief is a LOSS of containment barrier. The conditions also indicate a RED path exists for HEAT SINK CFST, which is a POTENTIAL loss of the RCS and Fission Product Barrier ONLY when a Heat Sink is required. Since a heat sink is NOT required for a LBLOCA, no potential loss exists. The LBLOCA causes a loss of subcooling.This indicates a LOSS of TWO fission product barriers. This is a SAE under FS1.1. SAE PARs are not made. Plausibility of requiring a PAR is based on the Attachment 9.1 flowchart for PARs of IP-EP-410. For a GE, a PAR is always made.

Technical References: IP-EP-120
Proposed References to be provided: EAL Wall Chart

Learning Objective

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments