

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	EPE 007 EK1.05	
	Importance	3.3	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Decay power as a function of time

Question # 1

A Reactor Trip occurs from 100% power due to a loss of off-site power. The operators are maintaining RCS Tavg at 547°F using the S/G ARV's in automatic control. Which of the following describes the actions the operator must take over the next 3-4 hours to maintain Tavg at 547°F and the reason for that action.

- A. The ARV's auto setpoint must be raised since decay heat decreases, requiring lower delta T to remove decay heat.
- B. The ARV's auto setpoint must be raised since natural circulation flow increases, requiring a lower delta T to remove decay heat.
- C. The ARV's auto setpoint must be lowered since natural circulation flow decreases, requiring a higher delta T to remove decay heat.
- D. The ARV's auto setpoint must be lowered since decay heat decreases less than natural circulation flow decreases, requiring a higher delta T to remove decay heat.

Answer: A

Explanation/Justification:

- A. Correct.: As decay heat lowers the reduction of heat into the RCS lowers Thot. In order to restore Thot and maintain Tavg, SG pressure/temperature must be raised.
- B. Incorrect: Natural circulation flow decreases as decay heat level decreases due to reduced core delta T.
- C. Incorrect: Lowering ARV setpoint will lower SG pressure/temperature and reduce RCS Tavg.
- D. Incorrect: A lower delta T is required, not a higher delta T.

Technical References: None

Proposed References to be provided: None

Learning Objective None

Question Source: Bank

Question History: Last NRC Exam Ginna 2006 Q1

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	EPE 009 EK2.03	
	Importance	3.0	

K/A Statement: Small Break LOCA-Knowledge of the interrelations between the small break LOCA and the following: S/G's

Question # 2

The crew transitions to FR-H.1, Response to Loss of Secondary Heat Sink, 15 minutes after a reactor trip.

Step 1 of FR-H.1 reads:

1. Check If Secondary Heat Sink Is Required:

a. RCS pressure - GREATER THAN ANY
NON-FAULTED S/G PRESSURE

a. IF RWST level greater than 28%
THEN return to procedure and
step in effect.

IF RWST level less than 28%
THEN go to ES-1.3. TRANSFER TO
COLD LEG RECIRCULATION. Step 1

Which of the following explains the basis for transitioning from the FR-H.1 procedure in the RNO column?

- A. Cold leg recirculation has not occurred. Must return to the procedure and step in effect and monitor RWST level.
- B. The intact SG is not functioning as a heat sink. Core decay heat can be removed by the faulted SG.
- C. Cold leg recirculation has not occurred. Must immediately transfer to cold leg recirculation.

- D. The intact SG is not functioning as a heat sink. Core decay heat can be removed by the RCS break flow.

Answer: D

Explanation/Justification:

This questions tests knowledge / understanding that small breaks (i.e., not large breaks) will require SGs to function as heat sinks for the core.

- A. Incorrect: Plausible because the examinee may miss the significance of RCS pressure and S/G pressure relationship and focus on whether or not cold leg recirculation was required based on RWST level.
- B. Incorrect: Plausible because while core heat removal may have been sufficient to remove decay heat until the faulted S/G dries out, long term heat removal is dependent on the availability of the intact S/G as a heat sink.
- C. Incorrect: Plausible because the examinee may miss the significance of RCS pressure and S/G pressure relationship and determine that decay heat removal will depend on the establishment of cold leg recirculation flow path
- D. Correct: With the loss of heat sink condition which warranted entry into FR-H.1, the check of RCS pressure less than S/G pressure determines whether break size is large enough to remove decay heat without reliance upon an intact S/G.

Technical References: FR-H.1 Background

Proposed References to be provided: None

Learning Objective RFRH1C 2.01

Question Source: Bank

Question History: Last NRC Exam Ginna 2012 Q8

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	1
	Group #	1	1
	K/A #	APE 015 G2.4.47	
	Importance	4.2	

K/A Statement: Reactor Coolant Pump Malfunctions – Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Question # 3

Given the following plant conditions:

The crew has entered AP-RCP.1, RCP SEAL MALFUNCTION
'A' RCP parameters are as follows:

- Seal #1 leakoff indicates 1.8 gpm and lowering
- Seal #2 leakoff to the RCDT is 2.2 gpm
- B-3, RCP 1A STAND PIPE HIGH LEVEL, is lit
- B-9, RCP 1A LABYR SEAL LO DIFF PRESS 15" H2O, is lit
- Seal Injection flow is approximately 9 gpm
- Containment radiation levels are normal and stable

Based on the symptoms given, which ONE of the following identifies the cause of these indications relating to #1, #2 and #3 Seals?

- A. ONLY #1 Seal has failed.
- B. ONLY #2 Seal has failed.
- C. ONLY #3 Seal has failed.
- D. BOTH #1 AND #2 Seals have failed.

Answer: B

Explanation/Justification:

- A. Incorrect. Seal #1 failure would be indicated by >8 gpm total seal flow or <0.8 gpm seal flow.

- B. Correct. Per attachment 15-1 standpipe high level is indication of Seal #2 failure and with 2.2 gpm leakoff is abnormally high.
- C. No indication of Seal #3 being failed. No rise in contamination radiation levels..
- D. Incorrect. Both seals have not failed. Seal #1 failure would be indicated by >8 gpm total seal flow or <0.8 gpm seal flow.

Technical References: NA

Proposed References to be provided: EOP Att, 15-1

Learning Objective	NA	
Question Source:	Bank ID 1680496	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CRF Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 025 AA2.04	
	Importance	3.3	

K/A Statement: Loss of RHR System – Ability to determine and interpret the following as they apply to the Loss of RHR System: Location and isolability of leaks

Question # 4

Given the following conditions:

- An SI has occurred due to a LOCA outside of containment.
- The source of RCS leakage is back-leakage from either V-853A or V-853B, RHR Inlet Check Valves to the Reactor Vessel Core Deluge Line.
- The leak location is on the common RHR HX discharge line to the reactor vessel and Loop 'B' cold leg.
- The crew has transitioned from E-0, Reactor Trip or Safety Injection, to the appropriate procedure

Which of the following identifies:

- (1) The COMPONENT that, when closed, could result in leak isolation
AND
 - (2) The SI FLOW CHANGE as a result of the successful leak isolation?
- A. (1) MOV-720, RHR Pump Discharge to Loop 'B' Cold Leg
(2) Flow LOWERS
 - B. (1) MOV-720, RHR Pump Discharge to Loop 'B' Cold Leg
(2) Flow RISES
 - C. (1) MOV-852A, RHR Pump Discharge to Reactor Vessel Deluge
(2) Flow LOWERS
 - D. (1) MOV-852A, RHR Pump Discharge to Reactor Vessel Deluge
(2) Flow RISES

Answer: C

Explanation/Justification:

: The leak is back leakage from either 853A or B. MOV-720 is not in that line and therefore would not isolate the leak

B. Incorrect: The leak is back leakage from either 853A or B. MOV-720 is not in that line and therefore would not isolate the leak

C. Correct: If MOV-852A is the successful isolation, then SI flow will lower since one of the SI paths has been isolated.

D. Incorrect: If MOV-852B is the successful isolation, then SI flow will lower, not rise, since one of the SI paths has been isolated.

Technical References:

Proposed References to be provided: None

Learning Objective None

Question Source: Bank ID 1680712

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 3
55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 026 AA1.02	
	Importance	3.2	

K/A Statement: Loss of CCW - Ability to operate and/or monitor the following as they apply to the Loss of Component Cooling Water: Loads on the CCWS in the control room.

Question # 5

The plant was operating at 100% power when the following conditions occurred:

- Component Cooling Water (CCW) Surge Tank level began to lower
- The operating crew entered AP-CCW.2, Loss of CCW During Power Operation
- CCW Surge Tank Level has stabilized using the normal makeup supply from RMW
- An AO dispatched reported that Seal Water Return Heat Exchanger flows and temperatures are outside of normal readings
- The Seal Water Return Heat exchanger has been bypassed and isolated
- All other CCW isolation valves remain in normal alignment

Which of the following describes the expected response of:

- (1) Volume Control Tank temperature; and
- (2) Pressurizer Relief Tank level

- A. (1) Rises
(2) Remains the same
- B. (1) Rises
(2) Rises
- C. (1) Remains the same
(2) Rises
- D. (1) Remains the same
(2) Remains the same

Answer: A

Explanation/Justification:

- A. Correct: Seal Water return flow is going directly to the VCT (without cooling) but, since MOV-313 remains open, the relief in the return line will not be opening to the PRT.
- B. Incorrect: Plausible because the first part is correct. The second part would be correct if the seal water heat exchanger was not bypassed and the return flow path was through relief V-314 while the leak location is in progress.
- C. Incorrect: Plausible because this would be correct if the seal water heat exchanger was not bypassed and the return flow path was through relief V-314.
- D. Incorrect: Plausible if the candidate thinks that seal water return flow will discharge to another tank (e.g., RDCT) through relief V-314.

Technical References: AP-CCW.2, Steps 6 & 7

Proposed References to be provided: None

Learning Objective RAP02C 2.01

Question Source: Bank

Question History: Last NRC Exam Ginna 2012 RO Retake Q7

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 027 G2.1.7	
	Importance	4.4	

K/A Statement: PPCS Malfunction - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Question # 6

Plant conditions:

- 100% power with all major controllers in AUTO
- PRZR Backup Heaters are ON
- Normal controlling channel input selected for 431K, PRZR PRESS CONTROLLER
- RCS Pressure Channels (PT-420 & PT-420A) are 2260 psig and rising

Assuming no operator action is taken, which ONE of the following identifies the failed channel, AND includes the system response to this failure?

- A. PT-429 failed; the PRZR spray valves will modulate open
- B. PT-429 failed; one PRZR PORV will open
- C. PT-449 failed; the PRZR spray valves will modulate open
- D. PT-449 failed; one PRZR PORV will open

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible since there are two control channels and the candidate who lacks detailed knowledge may confuse the purpose of PT-429. PT-429 is a control channel but is not the normally selected controlling channel. Spray valves will not open due to the controlling channel failure LOW..
- B. Incorrect. As noted above, the candidate who lacks detailed systems knowledge may confuse their functions; PT-429 is not the normally selected controlling channel.

- C. Incorrect: Plausible because PT-449 has failed low to turn on heaters, and sprays would not operate due to low pressure signal from 431K
- D. Correct: Due to the malfunction, spray valves will not respond to the pressure increase, due to the controlling channel failing low. However, PT-429 and PT-430 will open PORV-430 when pressure rises to 2335 psig.

Technical References: P-10, STEP 5.2.C.3

Proposed References to be provided: None

Learning Objective RIC02C 1.06

Question Source:

Question History: Last NRC Exam 2012 RO Retake Q#10

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	EPE 038 EA1.34	
	Importance	4.2	

K/A Statement: SGTR - Ability to operate and monitor the following as they apply to a SGTR:
Obtaining shutdown with natural circulation

Question # 7

Given the following;

- The plant was operating at 100% power when a Loss of Offsite Power (LOOP) occurred
- Subsequently a Steam Generator Tube Rupture (SGTR) occurred on 'A' Steam Generator
- Operators have entered E-3, Steam Generator Tube Rupture

Which statement(s) below correctly describe(s) plant response during the given conditions, as compared to an uncomplicated spurious reactor trip from full power.

Which of the following plant trends will occur due to the plant conditions given above, as compared to a plant trip and cooldown from 100% power without the LOOP-SGTR?

1. RCS pressure will lower more rapidly.
2. Steam generator pressures will rise more rapidly.
3. Pressurizer level will rapidly rise during the depressurization.
4. Potential flashing in inactive RCS regions will slow the cooldown.

- A. 2, 3 AND 4 ONLY
- B. 3 AND 4 ONLY
- C. 2 ONLY
- D. 1 ONLY

Answer: D

Explanation/Justification:

- A. Correct: Without offsite power available, the steam dump valves, which bypass the turbine to the condenser, will remain closed. Hence, energy transferred from the primary will rapidly increase steam generator pressures after reactor trip until the atmospheric relief valves lift to dissipate this energy. Due to depressurizing with the PORV's instead of the steam dumps will cause pressurizer level to rapidly rise. Also voiding in the head can cause the cooldown to be slower.
- B. Incorrect: Although 3 and 4 are correct, SG Pressure will also rise rapidly
- C. Incorrect: Although 2 is correct, 3 and 4 are also correct.
- D. Incorrect: RCS pressure lowers more slowly due to lower RCS flow and therefore slower heat transfer from the primary to secondary.

Technical References: E-3 Background Information

Proposed References to be provided: None

Learning Objective None

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehensive

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 054 AK1.02	
	Importance	3.6	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to the Loss of Main Feedwater: Effects of feedwater introduction on dry S/G.

Question # 8

Given the following conditions:

- The crew is performing FR-H.5, Response To Steam Generator Low Level, for 'A' S/G
- 'A' S/G wide range level is 130 inches and lowering slowly
- Containment pressure is 6 psig

Assuming conditions continue to deteriorate, "A" S/G will transition to being considered "dry" when wide range level drops below (1) and feed flow should not be established to a "dry" S/G because (2).

- A. (1) 50 inches
(2) significant thermal stresses could be caused on S/G components when the relatively cold feedwater flow is reinitiated
- B. (1) 50 inches
(2) feedwater introduction could result in an uncontrolled RCS cooldown and reduction in shutdown margin
- C. (1) 100 inches
(2) significant thermal stresses could be caused on S/G components when the relatively cold feedwater flow is reinitiated
- D. (1) 100 inches
(2) feedwater introduction could result in an uncontrolled RCS cooldown and reduction in shutdown margin

Answer: C

Explanation/Justification:

- A. Incorrect: Wrong minimum level.
- B. Incorrect: Wrong minimum level.
- C. Correct: Correct level and basis
- D. Incorrect. Wrong basis.

Technical References: None

Proposed References to be provided: None

Learning Objective None

Question Source: Bank ID 1680632

Question History: Last NRC Exam NA

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	EPE 055 EK1.02	
	Importance	4.1	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to the station blackout: Natural circulation cooling

Question # 9

The plant was at 100% power when a reactor trip and a station blackout occurred.

The crew has entered ECA 0.0, Loss of All AC Power, and is ready to start a RCS cooldown.

Step 23 directs, "*Initiate Depressurization Of Intact S/G's To 360 PSIG.*"

The first caution prior to step 23 states, S/G pressures should be maintained GREATER than 260 psig.

Which ONE of the following correctly identifies the operational implications of lowering S/G pressure LESS than 260 PSIG?

- A. Pressurizer level indication will be lost and upper head voiding may occur, challenging natural circulation.
- B. S/G narrow range level will lower to less than 7%, challenging primary to secondary heat transfer.
- C. SI Accumulator nitrogen will be injected into the RCS, challenging natural circulation.
- D. RCS cooldown rate will be excessive, challenging reactor coolant pump seal integrity.

Answer: C

Explanation/Justification:

A. Incorrect: Plausible because step 23 has a note stating that pressurizer level will be lost but this is not the reason to maintain greater than 260 psig in the S/G's.

B. Incorrect: Plausible because caution #2 prior to step 23 directs maintaining S/G level above 7%, however incorrect because lowering below 7% is not the reason to maintain S/G pressure above 260 PSIG.

C. Correct: Caution is to prevent nitrogen injection from accumulators which could threaten natural circulation flow.

D. Incorrect: Plausible because step 23 has a note discussing controlled cooldown of the RCP seals, but this is not the reason to maintain greater than 260 psig in the S/G's.

Technical References: ECA 0.0 and Background document

Proposed References to be provided: None

Learning Objective None

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 056 G2.4.20	
	Importance	3.8	

K/A Statement: Loss of Offsite Power - Knowledge of the operational implications of EOP warnings, cautions, and notes.

Question # 10

Given the following conditions:

- The plant has experienced a large break LOCA with a Loss of Offsite Power
- Neither EDG started automatically
- 'A' EDG was started from the main control board and Bus 14 and 18 were manually loaded per ATT 8.5, Attachment Loss Of Offsite Power
- 'A' EDG load is currently 2155 KW

Which ONE of the following is (1) the LONGEST amount of time (in hours) that the EDG can be allowed to operate under these conditions, and (2) the action (if any) that would be required to restore loading to within limits?

- | | (1) | (2) |
|----|-----|---|
| A. | 0.5 | Reduce load by stopping redundant safeguards equipment. |
| B. | 0.5 | No action required, loading will be reduced as the LOCA progresses. |
| C. | 2.0 | Reduce load by stopping redundant safeguards equipment. |
| D. | 2.0 | No action required, loading will be reduced as the LOCA progresses. |

Answer: D

Explanation/Justification:

This is a KA match because Att 8.5 has a caution *Observe EDG load limits when manually starting loads on the EDGs.*

A. Incorrect: Incorrect. Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 1 is plausible if the examinee does not recall the limits and believes he is above the maximum load rating. Part 2 is plausible (but incorrect) because there is redundancy in safeguards equipment, but loading is managed by Att-8.5, Loss of Offsite Power, and RNO actions in E-1 to check D/G loading prior to starting equipment.

B. Incorrect: Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 1 is plausible if the examinee does not recall the limits and believes he is above the maximum load rating. Part 2 is correct (see D below)

C. Incorrect: Part 1 is correct: Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 2 is plausible (but incorrect) because there is redundancy in safeguards equipment, but loading is managed by Att-8.5, Loss of Offsite Power, and RNO actions in E-1 to check D/G loading prior to starting equipment.

D. Correct: Each D/G is rated at: 1950 KW continuous operation, 2250 KW for 2 hours and 2300 KW for % hour. This load rating could be allowed for up to 2 hours. As indicated in the UFSAR loading ratings, current on the CNMT Recirc Fans will decrease as CNMT pressure/moisture is reduced without operator actions.

Technical References: AP Elec 14/16

Proposed References to be provided: None

Learning Objective NA

Question Source: Bank

Question History: Last NRC Exam Ginna 2012 Q 13

Question Cognitive Level: Comprehensive

10 CRF Part 55 Content: 55.41 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 057 AK3.01	
	Importance	4.1	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital ac electrical instrument bus

Question # 11

Given the following:

- The plant is at 100% power with all systems operating in automatic.
- The following indications are observed:

All Channel 2 Bistable Status lights are extinguished.

- The HCO determines that 120 VAC Instrument Bus B has been lost.

Which ONE of the following identifies why the crew places Rod Control in Manual?

- A. A Rod Block was generated preventing automatic rod control because intermediate Range N36 has failed low.
- B. A Rod Block was generated preventing automatic rod control because Loop A Tavg has failed low.
- C. Rods will continue to insert in auto because Turbine First Stage Channel PI485 has failed low.
- D. Rods will continue to insert in auto because Turbine First Stage Channel PI486 has failed low.

Answer: B

Explanation/Justification:

- A. Incorrect. While it is true that Intermediate Range Channel 36 does fail on loss of Instrument Bus B (Indicated by Channel 2 Status lights LIT), the IR Rod Stop is bypassed at high power. This failure will have no effect on Rod Movement.
- B. Correct. This failure will affect Rod Movement in AUTO because there is a rod block. Step 6.1.6 of ER-INST.3 directs placing Rods in Manual.

- C. Incorrect. A failure of Instrument Bus B (Indicated by Channel 2 Status lights LIT) would cause Turbine Impulse Pressure to fail low. Since this input is used to compare Turbine power to Reactor power in the rod control circuitry, rod control would inappropriately think turbine power has gone down, and drive rods in an attempt to match reactor power, IF a rod block wasn't already present.
- D. Incorrect. PI486 is powered by Instrument Bus C and will be unaffected for this event, but could potentially provide the same response as option C if selected

Technical References: ER-INST.3

Proposed References to be provided: None

Learning Objective R0901 C, 1.06

Question Source: Bank WTSI59476

Question History: Last NRC Exam: 2011 Q47

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 058 AA2.01	
	Importance	3.7	

K/A Statement: Ability to determine and interpret the following as they apply to the Loss of DC Power: That a loss of dc power has occurred; verification that substitute power sources have come on line

Question # 12

Given the following:

- The plant is operating at 100% power.
- The following alarms are received in the Control Room:
 - J21, 1A or 1B Battery Undervoltage
 - J-5 Battery Chrgr Failure or PA inverter Trouble
- DC Bus 'A' voltage indicates 113 VDC and lowering slowly.

Which ONE of the following correctly identifies the MINIMUM voltage at which the batteries may supply the 120 VAC inverter, and how the 1A Instrument Bus will remain energized on loss of Battery 'A'?

- A. 109 VDC; Inverter 1A will automatically transfer to the regulated supply.
- B. 109 VDC; Inverter 1A must be manually transferred to the regulated supply.
- C. 95 VDC; Inverter 1A will automatically transfer to the regulated supply.
- D. 95 VDC; Inverter 1A must be manually transferred to the regulated supply.

Answer: A

Explanation/Justification:

- A. Correct: 109 VDC is minimum, and inverter 1A has a static switch

B. Incorrect: Correct voltage but inverter 1A will automatically swap. Other inverters must be manually swapped.

C. Incorrect: Voltage is too low and the inverter will have automatically swap.

D. Incorrect: Voltage is below the operability limit for the DC bus. Manual swap relates to their inverters, not 1A.

Technical References: R0901C

Proposed References to be provided: None

Learning Objective R0901C, 1.06

Question Source: Bank

Question History: Last NRC Exam Ginna 2011 SRO Retake Q52

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 062 AA2.03	
	Importance	2.6	

K/A Statement: Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition.

Question # 13

Given the following:

- The plant is at 80% power.
- A Service Water Leak is occurring.
- The crew is performing actions of AP-SW.1, Service Water Leak.
- Service Water Pumps A, B, and D are running.
- A controlled plant shutdown is in progress.
- Service Water Loop "A" pressure is 42 psig.
- Service water Loop "B" pressure is 50 psig.
- The CRS directs splitting Service water loops.

Which ONE of the following choices describes the operability of the Service Water System, and contains the MINIMUM actions for isolating components for the current plant conditions?

- A. Required; BOTH SW loop cross-ties in the Screenhouse basement must be closed. NO other actions are required.
- B. Required; EITHER D/G SW cross-tie may be closed, and EITHER SW loop cross-tie in the Screenhouse basement may be closed.
- C. NOT required; BOTH SW loop cross-ties in the Screenhouse basement must be closed. NO other actions are required.
- D. NOT required; EITHER D/G SW cross-tie may be closed, and EITHER SW loop cross-tie in the Screenhouse basement may be closed.

Answer: B

Explanation/Justification:

- A. Incorrect: Both valves in each line are not required. Either valve will split the headers.
- B. Correct:
- C. Incorrect: Both valves in each line are not required. Either valve will split the headers. TS 3.7.8 must be entered.
- D. Incorrect: TS 3.7.8 must be entered.

Technical References: AP-SW.1 ATT 2.5

Proposed References to be provided: None

Learning Objective None

Question Source: Bank

Question History: Last NRC Exam Ginna 2007 Q52

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 065 AK3.04	
	Importance	3.0	

K/A Statement: Loss of Instrument Air - Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies

Question # 14

Given the following plant conditions:

- A steam line break occurred in Containment
- Condensate has been lost and auxiliary feedwater is unavailable
- The operating crew is performing FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK
- Containment pressure is 15 psig
- SI has been reset
- Actions to restore auxiliary feedwater have not been successful
- Bleed and Feed criteria have been met

Which ONE of the following choices correctly completes the following statement regarding establishment of an RCS bleed path?

PORVs will be opened to establish bleed and feed with _____ (1) _____ as the motive force for their operation because _____ (2) _____.

- A. (1) Instrument Air
(2) Nitrogen will not be available
- B. (1) Instrument Air
(2) Nitrogen capacity may be inadequate to maintain PORVs open for extended periods
- C. (1) Nitrogen
(2) Instrument Air will not be available
- D. (1) Nitrogen
(2) Instrument Air pressure may be inadequate causing PORVs to cycle closed and open

Answer: C

Explanation/Justification:

- A. Incorrect: IA is not available due to FR-H.1 manually initiating CI to basically bottle up the containment.
- B. Incorrect: IA is not available due to FR-H.1 manually initiating CI to basically bottle up the containment
- C. Correct: In accordance with FR-H.1, step 15, Establish RCS Bleed path, the PORV control switches are placed in OPEN and the RCS Overpressure Protection System is aligned to OPEN both PORVs using nitrogen. According to the Background Document "The PORVs are initially opened using nitrogen because a previous step actuated SI and CI, resulting in the loss of Instrument Air to CNMT."
- D. Incorrect: A note in FR-H.1 prior to Step 20 explains that PORVs may close temporarily until adequate IA pressure is restored when initially restoring IA to containment following establishment of bleed and feed. If CI were not actuated prior to bleed and feed, the subsequent RCS depressurization would automatically actuate CI, causing IA to isolate, which would cause PORVs to close until nitrogen was aligned. But the PORVs would not cycle closed then open on fluctuating IA pressure.

Technical References: FR-H.1

Proposed References to be provided: None

Learning Objective NA

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 077 AA1.01	
	Importance	3.6	

K/A Statement: Generator Voltage and Electric Grid Disturbances-Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Grid frequency and voltage

Question # 15

Given the following:

- The plant is operating at 100% power.
- RG&E Energy Control Center reports that disturbances have resulted in degraded grid frequency and voltage.
- The crew is referring to AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency.
- Grid frequency is currently 59.7 Hz.
- The crew starts 'A' and 'B' EDGs.

Which ONE of the following correctly identifies the minimum grid frequency threshold specified in the AP, below which the Safeguards Busses must be transferred to the EDG's, and the method used to transfer?

- A. 59.5 Hz; parallel the EDG with its associated bus and then open the normal bus feeder breaker when the EDG has assumed load.
- B. 59.5 Hz; open the normal bus feeder breaker and verify that the EDG output breaker has closed and the EDG is supplying the bus.
- C. 58.5 Hz; parallel the EDG with its associated bus and then open the normal bus feeder breaker when the EDG has assumed load.
- D. 58.5 Hz; open the normal bus feeder breaker and verify that the EDG output breaker has closed and the EDG is supplying the bus.

Answer: D

Explanation/Justification:

A. Incorrect: Frequency too high and in this condition you would not parallel the busses because of the low frequency.

B. Incorrect: Correct way to energize bus, but frequency is too high. Frequency is only at the level where EDG's are started, not connected to the bus.

C. Incorrect: Frequency is correct but method is not. Would not parallel EDG's at this low frequency.

D. Correct.

Technical References: AP-ELEC.2, Rev 01503, Steps 2-5

Proposed References to be provided: None

Learning Objective RAP08C,1.02, 2.01

Question Source: Bank

Question History: Last NRC Exam Ginna 2011 SRO Retake Q43

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b)

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	W E04 EK 2.2	
	Importance	3.8	

K/A Statement: Knowledge of interrelationships between LOCA outside containment 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.

Question # 16

A LOCA outside containment has occurred.

Which of the following lists (1) a concern and (2) a procedurally directed action for this event?

- A. (1) Ability to recirculate reactor coolant
(2) Initiate borated makeup to the containment sump
- B. (1) Ability to maintain shutdown boron concentration
(2) Fill the RWST from the condensate storage tank
- C. (1) Ability to recirculate reactor coolant
(2) Initiate borated makeup to the volume control tank
- D. (1) Ability to maintain shutdown boron concentration
(2) Fill the containment sump from the spent fuel pit

Answer: C

Explanation/Justification:

- A. Incorrect. Correct concern, not an action. Plausible because no recirc due to no sump.
- B. Incorrect. No use of unborated makeup, applicant may think any available water used.
- C. Correct. ECA 1.2 > ECA 1.1

D. Incorrect. The Spent Fuel Pit is a source for the RWST. Direct sump fill sounds good but not a method used.

Technical References: ECA 1.1, 1.2

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.4a (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	W E11 EK 3.4	
	Importance	3.6	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation): RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Question # 17

A LOCA is in progress.

The crew has transitioned to ES-1.3 to align for cold leg recirculation.

RWST level is 25%.

Containment sump B level is 50 inches.

What action is required, and why?

- A. Stop all pumps taking suction from the RWST to prevent pump damage due to loss of NPSH.
- B. Transition to ECA 1.1 "Loss of Emergency Coolant Recirculation" due to lack of adequate NPSH for RHR pumps.
- C. Stop one train of redundant safeguards pumps to minimize the rate of RWST depletion.
- D. Transition to ECA 1.2 "LOCA Outside Containment" due to loss of RWST inventory outside containment.

Answer: D

Explanation/Justification:

- A. Incorrect. This is an action for inadequate RWST level.
- B. Incorrect. This is an action for inadequate RWST level.
- C. Incorrect. This is action if staying in ES-1.3, but low sump level requires exit.

D. Correct. Required transition for inadequate sump level < 113 inches

Technical References: ES 1.3

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.4a (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	W E05 EK2.2	
	Importance	2.8	

K/A Statement: EK2.2, Knowledge of the interrelations between the (Loss of Secondary Heat Sink) 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.

Question # 18

Given the following conditions:

- A Loss of Heat Sink has occurred
- The crew is establishing RCS Bleed and Feed in accordance with FR-H.1, LOSS OF SECONDARY HEAT SINK
- The RO opens one PRZ PORV. He reports that the other PORV will NOT open

Which ONE of the following describes the consequences of the PORV failure?

- A. RCPs must be stopped, impeding core heat removal.
- B. RCS pressure may stabilize above SI pump shutoff head.
- C. RCS depressurization may not provide adequate heat removal.
- D. RCS bleed and feed must be stopped, depress SGs to inject condensate

Answer: C

Explanation/Justification:

- A. Incorrect. RCPs are stopped in FR-H.1, not for this reason
- B. Incorrect. RCS will depressurize eventually as core steams to hot leg elevation.
- C. Correct.

D. Incorrect. Bleed and feed must be continued.

Technical References: FR-H.1 and background

Proposed References to be provided:
Learning Objective

Question Source: Modified Bank 1680542

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	APE 1 G2.2.37	
	Importance	3.6	

K/A Statement: Continuous Rod Withdrawal – Ability to determine operability of safety related equipment.

Question # 19

Given the following conditions:

- The plant was at 75% power during a plant startup.
- A failure of the rod control temperature mismatch circuitry resulted in auto withdrawal of Control Bank D by 14 steps.
- Rod motion stopped when rods were placed in manual.

Which ONE of the following describes the operability status of the rods?

- A. Control rods are inoperable due to bank misalignment from demand position
- B. Control rods are inoperable due to loss of OP&OTΔT runback protection.
- C. Control rods are inoperable due to failure to meet bank insertion limits
- D. Control rods remain operable.

Answer: D

Explanation/Justification:

- A. Incorrect. Rod to bank, not bank to demand, is TS
- B. Incorrect. RPS, not rods
- C. Incorrect. Insertion limit
- D. Correct.

Technical References: TS

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 6,7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	APE 36 AA 2.03	
	Importance	3.1	

K/A Statement: Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Magnitude of potential radioactive release.

Question # 20

During fuel handling operations, a spent fuel assembly is dropped in the spent fuel pit.

Per the requirements of 10 CFR 50.67, an individual located at any point on the boundary of the exclusion area following the onset of the fission product release would not receive a total effective dose equivalent (TEDE) in excess of ...

- A. 1000 millirem in any 1-hour period.
- B. 1000 millirem in any 2-hour period.
- C. 25 rem in any 1-hour period.
- D. 25 rem in any 2-hour period.

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible for applicant that assumes design must ensure area dose not meet the definition of a high radiation area. This distractor value is close to the FSAR Chapter 15.3 analytical result of ~1.5 rem in a 2-hour period.
- B. Incorrect. Plausible for applicant that assumes design must ensure area dose not meet the definition of a high radiation area. This distractor value is close to the FSAR Chapter 15.3 analytical result of ~1.5 rem in a 2-hour period.
- C. Incorrect. Plausible that applicant might believe the limit is over a 1-hour period, not a 2-hour period.

- D. Correct. 10 CFR 50.67 states "an individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE)."

Technical References: FSAR section 15.7, table 15.7-3

Proposed References to be provided: none

Learning Objective R3701C Fuel Handling EO1.12b

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CFR Part 55 Content: 55.41 (b) 11

Comments: Most direct question to ask for KA. Answer is from accident analysis.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	APE 37 AK 1.02	
	Importance	3.5	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: Leak rate vs. pressure drop

Question # 21

The plant has been shut down due to a 1 gpm steam generator tube leak.

Which of the following is an action required by AP-SG.1 "Steam Generator Tube Leak" to minimize leakrate?

- A. Maximum rate cooldown to T_{sat} for SG pressure, followed by depressurization of the RCS below SG pressure.
- B. Minimize RCS pressure while preparing for cooldown.
- C. Secure the RCP in the affected loop.
- D. Raise ASDV setpoint on the affected SG.

Answer: B

Explanation/Justification:

- A. Incorrect. SGTR action, not SGTL
- B. Correct. SG.1 step 36
- C. Incorrect. Common misconception- shutdown RCP to "avoid pumping water out the break".
- D. Incorrect. SGTR action, not SGTL

Technical References: AP-SG.1

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	APE 051 AA1.04	
	Importance	2.5	

K/A Statement: Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position

Question # 22

The plant is stable at 75% power with rods in auto when a slow loss of condenser vacuum develops.

Which of the following describes expected plant response with no operator action?

- A. Tavg increase, rods step in.
- B. Tavg decrease, rods step out.
- C. Tavg increase, steam dumps open.
- D. NI power increase, rods step in.

Answer: A

Explanation/Justification:

- A. Correct.
- B. Incorrect. Loss of vac > loss of load
- C. Incorrect. Loss of load > Tavg increase
- D. Incorrect. Loss of vac > loss of load

Technical References: Normal Transients PPT

Proposed References to be provided:None

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	APE 68 AK 2.03	
	Importance	2.9	

K/A Statement: Knowledge of the interrelations between the Control Room Evacuation and the following: Controllers and positioners

Question # 23

The control room has been evacuated due to a fire. ER-FIRE.1 is being implemented.

Which of the following is NOT an action for which guidance is provided by ER-FIRE.1?

- A. Local closure of MSIVs
- B. Local operation of normal pressurizer spray
- C. Local operation of charging pumps.
- D. Local operation of a pressurizer PORV.

Answer: B

Explanation/Justification:

- A. Incorrect. CR action prior to evac, but local operation instructions provided
- B. Correct. RCPs tripped prior to evac
- C. Incorrect.
- D. Incorrect.

Technical References: ER-FIRE-1

Proposed References to be provided: none

Learning Objective

Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Memory	
10 CRF Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	W E06 & E07 EK 3.05	
	Importance	2.8	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling: Activating the HPI system

Question # 24

The crew is performing FR-C.1 Response to inadequate Core Cooling.

Which of the following, if available, is the most preferred, most effective means of recovering the core and achieving adequate core cooling?

- A. Initiate high pressure injection with ECCS.
- B. Establish feed and bleed cooling using SI and PORVs.
- C. Initiate forced core cooling using a reactor coolant pump.
- D. Cooldown at maximum rate with ASDVs to inject accumulators.

Answer: A

Explanation/Justification:

- A. Correct.
- B. Incorrect. Not a method in C.1, used in other FR-H.1
- C. Incorrect. Last resort method, in C.1
- D. Incorrect. Tried after HPI not available.

Technical References: FR-C.1 background.

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	W E15 EK 3.2	
	Importance	2.8	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the (Containment Flooding): Normal, abnormal and emergency operating procedures associated with (Containment Flooding).

Question # 25

The crew is performing AP-SW.1 Service Water Leak, and has determined the leak is in containment. This procedure requires consideration of plant shutdown at a specific containment sump level. Why is this necessary?

- A. DBA Accident analyses assume a minimum containment free volume, which will be violated if too much volume is filled with water.
- B. To prevent wetting of the reactor vessel with service water.
- C. DBA Accident analyses assumes a maximum dilution of SI water in the event of entry into ES-1.3; the specified level contains that maximum dilution volume.
- D. To prevent degradation of iodine retention capability of recirc spray.

Answer: B

Explanation/Justification:

- A. Incorrect.
- B. Correct. Step 4 provides the shutdown guidance based on sump level because of concerns over wetting of the reactor vessel.
- C. Incorrect.
- D. Incorrect.

Technical References: AP-SW.1 background.

Proposed References to be provided: none

Learning Objective

Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Memory	
10 CRF Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	W E03 EK 2.2	
	Importance	3.7	

K/A Statement: LOCA cooldown/depress - Knowledge of the interrelations between the (LOCA Cooldown and Depressurization) 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.

Question # 26

A small break LOCA is in progress. All safeguards systems functioned as designed. The crew has entered ES-1.2, Post LOCA Cooldown and Depressurization. The following conditions exist:

- Adverse containment
- RCS pressure: stable at 700 psig
- RCS subcooling: 0°F
- Pressurizer level: 0%

What cooldown rate is required?

- A. Maximum rate to minimize inventory loss while setting RHR cooling conditions
- B. Between 80 and 100 °F/hour, technical specification cooldown rate
- C. Maximum rate cooldown to avoid entry into the functional recovery for integrity
- D. Less than 25 °F/hour, natural circulation cooldown rate

Answer: B

Explanation/Justification:

- A. Incorrect. Plausible reason, correct endpoint
- B. Correct.

C. Incorrect. Injection may cause FR-P condition, not to be entered.

D. Incorrect. Plausible due to no RCPs given conditions

Technical References: ES-1.2

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	W E08 EA 2.2	
	Importance	3.5	

K/A Statement: Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Question # 27

A steam line break event is in progress. Automatic main steam line isolation failed; one MSIV was closed manually. The faulted SG continues to blow down. The crew has just implemented FR-P.1, Response to Imminent Pressurized Thermal Shock.

The following conditions exist:

- Normal containment
- SG NR levels off scale low
- Loop TC: 300 °F on faulted SG loop, 350 °F on intact SG loop

Which of the following states the SG feed strategy?

- A. Isolate all feed to both SGs until faulted SG blowdown is complete.
- B. Isolate feed to the faulted SG, feed intact SG at maximum rate to > 7% NR.
- C. Feed the faulted SG at 50 gpm, feed intact SG at slowest rate that will raise level.
- D. Isolate feed to the faulted SG, feed intact SG at greater than 200 gpm to > 7% NR.

Answer: D

Explanation/Justification:

A. Incorrect.

B. Incorrect. The goal of the procedure in general and specifically of Step 2 is to stop the cooldown. Step 2 RNO column directs the operator to **control** total feed flow to the non-faulted S/G(s) greater than 200 gpm, based on minimum flow necessary for heat removal. Feeding at the maximum possible rate would not meet the intent of the step because the operator would not be exercising appropriate control to limit cooldown.

C. Incorrect.

D. Correct.

Technical References: FR-P.1

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	003 A3.01	
	Importance	2.8	

K/A Statement: Ability to monitor automatic operation of the RCPS, including: Seal injection flow

Question # 28

A small break LOCA has occurred. SI has been initiated.

Which of the following describes the expected indications for RCP seal injection and leakoff flow?

- A. Seal injection: 0; Seal leakoff: 0
- B. Seal injection: 0; Seal leakoff: 3 gpm per RCP.
- C. Seal injection: 8 gpm per RCP; Seal leakoff: 0
- D. Seal injection: 8 gpm per RCP; Seal leakoff >.6 gpm per RCP

Answer: B

Explanation/Justification:

- A. Incorrect. Chg Pps trip; leakoff unaffected
- B. Correct.
- C. Incorrect. Chg Pps trip; leakoff unaffected
- D. Incorrect. Chg Pps trip; leakoff unaffected

Technical References: CVCS, RCP, ECCS PPT LPs

Proposed References to be provided: none

Learning Objective

Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Memory	
10 CRF Part 55 Content:	55.43 (b) 4	
Comments:		

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	004 K4.08	
	Importance	3.6	

K/A Statement: Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following: Hydrogen control in RCS

Question # 29

The plant is performing a power escalation from 50% to 100% power following a refueling outage.

Which of the following describes how RCS hydrogen concentration is controlled as directed by Chemistry?

- A. Inject hydrazine via the chemical addition tank.
- B. Adjust Volume Control Tank pressure.
- C. Adjust Reactor Coolant System pressure.
- D. Inject hydrogen peroxide via the chemical addition tank.

Answer: B

Explanation/Justification:

- A. Incorrect. Hydrazine is added for oxygen scavenging at less than 180 °F. The scavenging reaction is $\text{N}_2\text{H}_4 + \text{O}_2 \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$. Plausible because hydrazine is added, hydrazine sounds like it consists of hydrogen and because chemically a hydrazine molecule is composed primarily of hydrogen atoms.
- B. Correct. Hydrogen gas pressurizes the VCT gas space and the pressure determines the hydrogen concentration in solution. Raising VCT gas pressure increased the RCS hydrogen concentration.

- C. Incorrect. Adjusting RCS pressure will have some small effect on amount of gas in solution but is not used as a method for hydrogen control.
- D. Incorrect. Hydrogen peroxide is added during shutdown with RCS temperature less than 180 °F to initiate a crud burst prior to commencing outage work. It is not added for hydrogen control.

Technical References: CVCS PPT LP

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CRF Part 55 Content: 55.43 (b) 4

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	004 A3.02	
	Importance	3.6	

K/A Statement: Ability to monitor automatic operation of the CVCS, including: Letdown isolation.

Question # 30

An RCS leak is in progress. Pressurizer level is lowering. When will letdown isolation occur, and what valves will isolate?

- A. PZR level < 20%; AOV-427 ONLY.
- B. PZR level <20%; AOV-427 AND AOV-200A, AOV200B, AOV202.
- C. PZR level <13%; AOV-427 ONLY.
- D. PZR level <13%; AOV-427 AND AOV-200A, AOV200B, AOV202.

Answer: D

Explanation/Justification:

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

Technical References: R1601C CVCS PPT

Proposed References to be provided: none

Learning Objective

Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Memory	
10 CRF Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	005 (SF4P RHR)	K6.03
	Importance	2.5	

K/A Statement: Residual Heat Removal: Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger

Question # 31

Reactor is in MODE 5

RCS temperature is 175 °F and stable

RCS pressure is 300 psig

'A' RHR pump and heat exchanger are in service and aligned to the RCS

'B' RHR train is secured

'A' Train RHR flow is being maintained at 1500 gpm in AUTO

A 100 gpm leak develops in the 'A' RHR Heat Exchanger.

Which of the following describes the plant response to these conditions?

(Assume no operator action)

(HCV-625 is 'A' RHR Outlet FCV, HCV-626 is RHR HX Bypass FCV)

- A. HCV-625 will close slightly to maintain HX outlet temperature.
HCV-626 position will not change.
- B. HCV-625 will open slightly to maintain constant HX flow.
HCV-626 will close slightly to maintain RHR return temperature.
- C. HCV-625 position will not change.
HCV-626 will open slightly to maintain constant RHR return flow.
- D. HCV-625 position will not change.
HCV-626 will close slightly to maintain constant RHR return flow.

Answer: C

Explanation/Justification:

- A. Incorrect, See C
- B. ncorrect, See C
- C. Correct. HCV-625 is a manually controlled valve. HCV-626 will sense a lower flow rate running to the RCS due to the leak and will therefore adjust itself open to raise flow to maintain measured flow at 1500 gpm.
- D. Incorrect, correct HCV-625 response but opposite HCV-626 response.

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank: Point Beach 2012

Question History: Last NRC Exam Point Beach 2012

Question Cognitive Level: Fundamental

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	006 A 1.14	
	Importance	3.6	

K/A Statement: ECCS – Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: Reactor vessel level

Question # 32

Given the following conditions:

- The crew is responding to a LOCA and is performing SI flow reduction steps in ES-1.2, Post LOCA Cooldown and Depressurization.
- RCPs are stopped
- The crew has just stopped a second SI pump, leaving one SI pump is still running.
- The crew observes pressurizer level start to rise, and RCS subcooling decreases to minus 5 deg F trending down slow.

What is the expected behavior of RVLIS and what action is required?

- RVLIS will trend with PZR level.
Start SI pumps as necccesary.
- RVLIS will trend with PZR level.
No action is required unless PZR level cannot be maintained greater than 10% [30% adverse CNMT].
- RVLIS will be trending down.
Start SI pumps as necessary
- RVLIS will be trending down.
No action is required unless PZR level cannot be maintained greater than 10% [30% adverse CNMT].

Answer: C

Explanation/Justification:

- A. Incorrect. Conditions indicate head bubble, RVLIS down, need SI.
- B. Incorrect. .
- C. Correct. ES-1.2 Foldout page
- D. Incorrect. SI pump needed now, applicant may either subcooling OR pwr level is adequate.

Technical References: ES-1.2

Proposed References to be provided: none

Learning Objective

Question Source:	New	
Question History:	Last NRC Exam	xxxxx
Question Cognitive Level:	Comprehension	
10 CRF Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	007 (SF5 PRTS)	K5.02
	Importance	3.1	

K/A Statement: Pressurizer Relief/Quench Tank: Knowledge of the operational implications of the following concepts as they apply to PRTS: Method of forming a steam bubble in the PZR

Question # 33

Given the following plant conditions:

O-1.1, Plant Heatup from Cold Shutdown to Hot Shutdown, is in progress. RCS Fill and Vent using O-1B, Vacuum Refill of the Reactor Coolant System, is complete. Preparations for drawing a bubble in the Pressurizer are being made.

Which one of the following describes the condition of the PRT prior to raising RCS pressure and heating up the pressurizer to draw a steam bubble?

- A. Filled between 30 and 50% and vented to atmosphere via a vent hose to prevent overpressurization if the PORVs lift.
- B. Filled between 30 and 50% and pressurized between 1 and 3 psig with Nitrogen to prevent an explosive Hydrogen-Oxygen mixture if the PORVs lift.
- C. Filled between 61 and 84% and vented to atmosphere via a vent hose to prevent overpressurization if the PORVs lift.
- D. Filled between 61 and 84% and pressurized between 1 and 3 psig with Nitrogen to prevent an explosive Hydrogen-Oxygen mixture if the PORVs lift.

Answer: D

Explanation/Justification:

A. Incorrect. Level is below normal band, vent path is required to be shut. This would be the lineup for filling and venting the pressurizer when going solid.

B. Incorrect. Level is below normal band.

C. Incorrect. Level is correct but vent condition is incorrect. This would be the lineup for filling and venting the pressurizer when going solid.

D. Correct.

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam Ginna 2006

Question Cognitive Level: Fundamental

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	007 (SF5 PRTS)	A1.02
	Importance	2.7	

K/A Statement: Pressurizer Relief/Quench Tank: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank pressure

Question # 34

The reactor is operating at 100% power.
Annunciator F-9, PRT HI PRESS 5 PSI is lit.

The following are indications for the PRT:

PRT pressure: 6.0 PSIG and RISING SLOWLY
PRT temperature: 115°F
PRT level: 62% and STABLE

If allowed to continue,

The PRT rupture disc will discharge to containment when pressure in the PRT rises to (1) .
The operators must (2) to prevent PRT rupture disc operation.

- A. (1) 50 psig
(2) vent the PRT
- B. (1) 50 psig
(2) drain the PRT to the RCDT
- C. (1) 100 psig
(2) drain the PRT to the RCDT
- D. (1) 100 psig
(2) vent the PRT

Answer: D

Explanation/Justification:

- A. Incorrect. Wrong setpoint, correct action.
- B. Incorrect. Wrong setpoint, wrong action (draining would bring in low level alarm).
- C. Incorrect. Correct setpoint, wrong action (draining would bring in low level alarm).
- D. Correct. Per AR-F-9, PRT pressure may be lowered by the draining method in step 4.3 or the venting method in step 4.4. Venting is correct action in this case to prevent bringing in low level alarm at 60.8%.

Plausible because ...

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam: Ginna 2010

Question Cognitive Level: Comprehension

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	008 (SF8 CCW) K4.01	
	Importance	3.1	

K/A Statement: Component Cooling Water: Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Automatic start of standby pump

Question # 35

Given the following plant conditions:

Plant is at 100%, with a 50/50 normal electrical alignment.
"B" CCW pump is in service.

Subsequently, the following occurs:

Off-site power circuit 767 trips

The associated Emergency Diesel Generator fails to start

With no operator action, ___(1)___ CCW pump will be running with ___(2)___ CCW pump breaker red indicating light(s) lit on the MCB.

- | | | |
|----|----------|----------|
| | (1) | (2) |
| A. | only "A" | only "A" |
| B. | only "A" | both |
| C. | only "B" | only "B" |
| D. | only "B" | both |

Answer: B

Explanation/Justification:

A. Incorrect.

B. Correct. In the 50/50 electrical alignment, the loss of Circuit 767 and "B" DG failure to start will result in no power to the "B" CCW pump. The "A" CCW pump still has off-site power available, and will start automatically as soon as CCW system pressure lowers to 50 psig. When the "A" CCW pump starts, its associated breaker red indicating light will light. Although the "B"

CCW pump has no power, its breaker is still closed, and therefore its red light is still lit. There are no UV trips for the CCW pumps.

C. Incorrect.

Plausible because...

D. Incorrect.

Plausible because ...

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam 2012

Question Cognitive Level: Comprehension

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	010 K6.04	
	Importance	2.9	

K/A Statement: PZR Press Control – Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: PRT

Question # 36

Given the following conditions:

- PRT Drain Valve AOV-526 has failed to close after a draining operation.
- The low level alarm has annunciated.
- PRT level is at 50% and has been stabilized with makeup.

What effect does this have on pressurizer pressure control?

- Pressurizer PORVs and SAFETIES are both INOPERABLE. The PRT cannot meet design basis requirements.
- Pressurizer PORVs are INOPERABLE but SAFETIES are OPERABLE. Close block valves within 1 hour.
- Pressurizer PORVs and SAFETIES are both INOPERABLE. Enter TS LCO 3.0.3 immediately.
- Pressurizer PORVs and SAFETIES are both OPERABLE. The PRT rupture disc will fail earlier under design basis assumptions.

Answer: D

Explanation/Justification:

- Incorrect. PRT will still meet design requirements, given adequate minimum level in PRT.
- Incorrect. Availability of the PRT is not a basis for PORV operability.

- C. Incorrect. Availability of the PRT is not a basis for PORV or Safety availability
- D. Correct. Level is low, so the rupture disc will be challenged sooner following PORV discharge.

Technical References: R1401C PZR PPT; S 3.4.9,10,11

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	010 (SF3 PZR PCS) G2.2.38	
	Importance	3.6	

K/A Statement: Pressurizer Pressure Control: Knowledge of conditions and limitations in the facility license.

Question # 37

Given the following conditions:

The RCS is at 350°F, going solid IAW O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions.

The operators become distracted by reports of a fire in the Turbine Building.

As a result of the passive failure of several overpressure protection components coupled with the distraction, RCS pressure rises and stabilizes at 2800 psig before operators respond.

Select the choice which correctly completes the following statement:

In accordance with the most time limiting applicable Technical Specification, pressure must be reduce to restore compliance _____.

- A. immediately
- B. within 5 minutes
- C. within 30 minutes
- D. within 60 minutes

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because many TS require immediate response.

B. Correct. To comply with RCS Pressure Safety Limit in Modes 3, 4 and 5 (which is the most limiting of applicable Tech Specs) requires compliance within 5 minutes.

C. Incorrect. Plausible because this is the correct time for compliance with TS LCO 3.4.3 RCS P/T Limits.

D. Incorrect. Plausible because this is the correct answer for compliance with RCS Pressure SL 2.1.2 when in Modes 1 or 2.

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam 2012

Question Cognitive Level: Fundamental

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	012 (SF7 RPS)	A4.01
	Importance	4.5	

K/A Statement: Reactor Protection: Ability to manually operate and/or monitor in the control room: Manual trip button

Question # 38

Given the following:

A plant startup is in progress with power at 5%
Operators are NOT aware that the UV trip coil for RTB 'A' is jammed in its current position and will not function if called upon

If an automatic zirconium guide tube trip signal occurs, then in order to open BOTH RTBs, the operator ____ (1) ____, because ____ (2) ____.

- A. (1) Must depress either the manual reactor trip pushbutton or the local 'A' RTB trip pushbutton
(2) 'A' RTB will still be closed
- B. (1) Must depress the manual reactor trip pushbutton; local RTB pushbutton will not function
(2) 'A' RTB will still be closed
- C. (1) Will not have to take any further actions
(2) only the shunt coil opened 'A' RTB and only the UV coil opened 'B' RTB
- D. (1) Will not have to take any further actions
(2) only the shunt coil opened 'A' RTB and both the shunt and UV coils opened 'B' RTB

Answer: A

Explanation/Justification:

A. Correct. The zirconium guide tube trip is unique in that it utilizes the UV trip coil only. With the 'A' RTB UV coil mechanically jammed, the zirconium guide tube trip signal will not trip the 'A' RTB. Depressing the manual reactor trip pushbutton energize both the 'A' and 'B' RTB shunt coils, which will open both breakers. The 'A' RTB can also be opened by depressing the local trip button at the breaker. The zirconium guide tube trip is enabled only when power is below P-7 setpoint (8%).

B. Incorrect.

C. Incorrect.

Plausible because...

D. Incorrect.

Plausible because ...

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam 2012

Question Cognitive Level: Fundamental

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	013 (SF2 ESFAS)	K5.02
	Importance	2.9	

K/A Statement: Engineered Safety Features Actuation: Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability

Question # 39

The reactor is at full power when an electrical malfunction resulted in the “A” train SI block switch failing to the “block” position.

Which one of the following states the effect this will have on SI actuation signals?

- A. All “A” train SI signals are immediately blocked.
- B. “A” train S/G and PRZR auto SI signals will remain fully functional. The remaining “A” train SI signals are immediately blocked.
- C. “A” train manual and high containment pressure SI signals will remain fully functional. The remaining “A” train SI signals are immediately blocked.
- D. “A” train manual and high containment pressure SI signals will remain fully functional. “A” train S/G and PRZR auto SI signals will be blocked when PRZR pressure lowers to the block setpoint.

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible because one might mistakenly think that “SI block” blocks all SI signals, Incorrect because manual and high containment pressure SI signals are not blocked.
- B. Incorrect. Plausible because one might mistakenly think that “SI block” blocks all SI signals except S/G and PRZR signals. Incorrect because manual and high containment pressure

SI signals are not blocked.

- C. Incorrect. Plausible because this correctly identifies which signals are blocked. Incorrect because the block will not function until 2 of 3 PRZR pressures decrease to < 1992 psig (not *immediately* as stated)
- D. Correct. With the switch failed in the “block” position, the block of PRZR and S/G SI signals will occur when 2 of 3 PRZR pressures decrease to <1992 psig. The manual and high containment SI signals remain fully functional

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam Ginna

Question Cognitive Level: Comprehension

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	022 (SF5 CCS) A4.01	
	Importance	3.6	

K/A Statement: Containment Cooling: Ability to manually operate and/or monitor in the control room: CCS fans

Question # 40

Plant conditions:

- A LOCA is in progress
- SI has actuated
- Off-site power was lost
- D/G "A" tripped during startup
- D/G "B" is running and loaded onto its respective safeguards busses
- CRFC "B" has tripped (green and white light indications lit)

Which choice accurately completes the following statements?

When performing Attachment 27, Automatic Action Verification, the Operator ____ (1) ____ to attempt to restart CRFC "B." With CRFC "B" tripped, accident analysis assumptions for the number of running CRFCs ____ (2) ____ met.

- A. (1) is permitted
(2) are
- B. (1) is permitted
(2) are NOT
- C. (1) is NOT permitted
(2) are
- D. (1) is NOT permitted
(2) are NOT

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because part 1 is correct and if the candidate does not consider that both a CS pump AND 'A' and 'D' CRFCs are OOS with the failure of 'A' EDG to start, he might believe that the minimum CNMT heat removal requirements are met with a single CS pump and single CRFC on the 'B' EDG.

B. Correct. One restart is allowed. In conjunction with the single CS pump powered from 'B' EDG, only 1 of two CRFCs also required are met. This does NOT meet the minimum heat removal requirements of the accident analysis.

C. Incorrect. Plausible because the candidate may believe that a restart of a tripped component is not allowed procedurally. Part 2 is plausible if the candidate does not consider that both a CS pump and 'A' and 'D' CRFCs are OOS with a failure of 'A' EDG to start, he might believe that the minimum CNMT heat removal requirements are met with a single CS pump and single CRFC on the 'A' EDG.

D. Incorrect. Plausible because the candidate may believe that a restart of a tripped component is not allowed procedurally. Part 2 is correct

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam Ginna 2012

Question Cognitive Level: Fundamental

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	026 K3.01	
	Importance	3.9	

K/A Statement: Knowledge of the effect that a loss or malfunction of the CSS [CONTAINMENT SPRAY SYSTEM] will have on the following: CCS [CONTAINMENT COOLING SYSTEM]

Question # 41

The plant has experienced a LOCA, followed by an automatic SI initiation and containment spray actuation. The following conditions exist:

- 'D' CRFC out of service for maintenance
- Containment pressure = 40 psig and rising
- RHR pumps are in standby
- L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP, is lit
- The normal supply breaker to Bus 16 opened and Bus 16 is de-energized

Which ONE of the following correctly describes plant conditions and/or operator actions with regard to containment peak design pressure and temperature limits?

- A. There is adequate equipment available, per design, to maintain within limits.
- B. Limits, per design, will not be exceeded if 'D' CRFC is restored.
- C. Start an additional Service Water pump to maintain within limits.
- D. Limits, per design, will not be exceeded if 'B' EDG is manually started.

Answer: B

Explanation/Justification:

- A. Incorrect: See below. Plausible because it's essential that the candidate realize that 'B' and 'C' CRFCs are powered from Bus 16, leaving only a single CRFC available.

- B. Correct: With '0' CRFC out for maintenance and Bus 16 de-energized (CRFC 'B' & 'C'), only 1 CRFC is operating along with the single 'A' CS pump. Adequate CNMT cooling requires both CS pumps, and all 4 CRFCs, or 1 CS pump and 2 CRFCs. EOGs can't power up Bus 16 due to the unknown bus fault. Need to restore either Bus 16 or the '0' CRFC.
- C. Incorrect: Plausible because candidate may believe starting additional SW cooling flow will remedy the cooling problem, when in fact the minimum equipment requirements cannot be met.
- D. Incorrect: Plausible because although the actions seem conservative, the root information identifies that there is an unknown bus fault on Bus 16 (which would prevent the EDG output breaker for Bus 16 from closing in on the bus).

Technical References: ITS 3.6.6 basis

Proposed References to be provided: None

Learning Objective R2401C 1.01

Question Source: Bank

Question History: Last NRC Exam Ginna 2012 Q#35

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	026 A2.08	
	Importance	3.2	

K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safe securing of containment spray when it can be done)

Question # 42

A LOCA has occurred. The crew performed E-0 and E-1, and has now transitioned to ES-1.1, S SI Termination.

When may both containment spray pumps be stopped?

- A. When containment pressure is less than 28 psig.
- B. When entry is required into ES-1.3, Transfer to Cold Leg Recirculation.
- C. When containment pressure is less than the adverse containment value.
- D. When containment pressure is lowering and all Containment Recirc Filtration Units are in service.

Answer: C

Explanation/Justification:

- A. Incorrect. Plausible because 28 psig is containment spray actuation setpoint.
- B. Incorrect. Plausible because RWST inventory is a concern.
- C. Correct. ES-1.1 criteria is 4 psig, which is the adverse containment value
- D. Incorrect. In E-1, may go down to 1 CS pump at step 13 with this condition.

Technical References: E0, E1, ES-1.1

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Memory

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	039 A4.04	
	Importance	3.8	

K/A Statement: Main and Reheat Steam: Ability to manually operate and/or monitor in the control room: Emergency feedwater pump turbines

Question # 43

Which ONE of the following identifies the indication available in the control room that the TDAFW pump turbine was overspeeding and has tripped?

- A. Discharge pressure indicated 1500 psig and rising prior to Steam Supply Valves MOV-3504A and MOV-3505A automatically closing.
- B. Speed indication rising to 4850 rpm followed by Steam Supply Valves MOV-3504A and MOV-3505A automatically closing.
- C. Discharge pressure indicated 1500 psig and rising prior to Stop Valve 3652 automatically closing.
- D. Speed indication rising to 4850 rpm followed by Stop Valve 3652 automatically closing.

Answer: C

Explanation/Justification:

- A. Incorrect. Discharge pressure rising is an indication of overspeed, but steam supply valves only receive an open signal, not auto close
- B. Incorrect. The pump runs at 4800 RPM, so 4850 rpm is higher than normal but not high enough to cause an overspeed. Additionally, steam supply valves do not automatically close, the steam stop valve does.
- C. Correct.
- D. Incorrect. The pump runs at 4800 RPM, so 4850 rpm is higher than normal but not high enough to cause an overspeed. Valve position is correct for this option.

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Bank

Question History: Last NRC Exam 2011

Question Cognitive Level: Fundamental

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	039 (SF4S MSS) G2.4.45	
	Importance	4.1	

K/A Statement: Main and Reheat Steam: Ability to prioritize and interpret the significance of each annunciator or alarm

Question # 44

Given the following:

At 10:00, plant conditions are as follows:

- Mode 3, cooling down per O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions
- RCS T_{AVG} is 495°F and stable
- RCS Pressure is 1750 psig and stable
- Both Steam Generator pressures are 640 psig and stable

At 10:20, a steam line break occurs on the "A" S/G main steam line inside containment resulting in the following indications:

- Containment pressure is 10 psig and rising
- RCS pressure is 1150 psig and lowering
- "A" S/G pressure is 400 psig and lowering
- "B" S/G pressure is 460 psig and lowering
- Annunciator G-26, S/G A HI STEAM FLOW is lit
- Annunciator G-31, S/G B HI STEAM FLOW is NOT lit

Which of the following describes the expected position of AOV-3517 "A" Main Steam Isolation Valve, and why?

- OPEN, the valve will automatically close when containment pressure rises to 18 psig.
- CLOSED, the valve will have automatically closed when "A" S/G pressure reached 545 psig.

- C. OPEN, the valve will not automatically close due to the SI block, it must be manually closed.
- D. CLOSED, the valve will have automatically closed on the "A" S/G steam flow HIGH and Low TAVG coincident with a SI signal

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible because the answer is correct if the candidate does not recall the auto closure signal on High Steam Flow, SI signal and Low Tavg
- B. Incorrect. Plausible because the answer is similar to the value for Low T_{AVG}
- C. Incorrect. Plausible because the answer is correct if the candidate does not recall the auto closure signal on High Steam Flow, SI signal and Low Tavg
- D. Correct. MSIV shuts on SI signal with high steam flow & Low T_{AVG}

Technical References:

Proposed References to be provided: None

Learning Objective

Question Source: Modified

Question History: Last NRC Exam PB 2015

Question Cognitive Level: Comprehension

10 CRF Part 55 Content:

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	059 K4.08	
	Importance	2.5	

K/A Statement: Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)

Question # 45

The plant is at 100% power when the following alarms actuate:

- AR-G-19 SG A FLOW MISMATCH
- AR-G-20 ADFCS SYSTEM TRANSFER TO MANUAL CONTROL

WHICH ONE of the following combinations of instrument failures would give the above indications and which loop flow control valves will shift to manual?

- A. Two A S/G pressure instruments fail, ONLY A loop valves shift to manual
- B. Two A loop feed flow instruments fail, ONLY A loop valves shift to manual
- C. Two A S/G pressure instruments fail, BOTH A AND B loop valves shift to manual
- D. Two A loop feed flow instruments fail, BOTH A AND B loop valves shift to manual

Answer: D

Explanation/Justification:

- A. Incorrect: Per AR-G-20 the setpoint for SG pressure instruments is 2 or 3 instruments fail in both loops. Therefore AR-G-20 alarm will not come in. Plausible because AR-G-19 would still come in since steam flow is compensated by steam pressure.
- B. Incorrect: Per AR-G-20 if 2 or 3 instruments fail in a feed loop then both loop feed regulating valves shift to manual. Therefore wrong because the B loop would also shift to manual.
- C. Incorrect: Per AR-G-20 the setpoint for SG pressure instruments is 2 or 3 instruments fail in both loops. Therefore AR-G-20 alarm will not come in. Plausible because AR-G-19 would

still come in since steam flow is compensated by steam pressure

- D Correct: Per AR-G-20 if 2 or 3 instruments fail in a feed loop then both loop feed regulating valves shift to manual.

Technical References: AR-G-19 and 20

Proposed References to be provided: None

Learning Objective NA

Question Source: New

Question History: Last NRC Exam: NA

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	061 K2.02	
	Importance	3.7	

K/A Statement: Auxiliary/Emergency Feedwater - Knowledge of bus power supplies to the following: AFW electric drive pumps.

Question # 46

The plant has been operating at 100% power and "B" Motor Driven Auxiliary Feedwater Pump was tagged out of service for motor inspection 24 hours ago.

A spurious Train "B" Safety Injection Actuation Signal occurs. Immediately thereafter, annunciator AR-L28, 12B XFMR OR 12B BUS TROUBLE, actuates (86T/12B LOCKOUT).

Assuming no operator actions, WHICH of the following choices correctly describes the status of the motor driven and standby auxiliary feedwater pumps two minutes later?

- A. No Motor-Driven or Standby Auxiliary Feedwater Pump is running.
- B. Only "A" Motor-Driven Auxiliary Feedwater Pump is running.
- C. Only "A" Motor-Driven and "D" Standby Auxiliary Feedwater Pumps are running.
- D. Only "D" Standby Auxiliary Feedwater Pump is running.

Answer: B

Explanation/Justification:

B. Correct. Given the conditions in the stem, even though both 14 and 16 480V Buses are energized (Bus 16 is powered from EDG B and Bus 14 is powered from 4160V Bus 12A), only the "A" MDAFW Pump will be running due to the SG shrinkage and MFWP breakers opening on an SI signal. The applicants need to know what buses are energized and, that although D SAFW pumps may be aligned to Bus 16 because the B MDAFWP is OOS, SAFW pumps will not automatically start on an SI signal.

A. Incorrect. The "A" MDAFW Pump will be running because it will receive start signals (SG shrinkage and MFWP breakers open) and have power. Plausible because the applicants may confuse which 4160V bus powers which 480V bus in which case they could think that there is no power to "A" Train 480V bus and thus the "A" MDAFWP will not be running. Also, the applicants could think that the "A" MDAFWP is not running because there was no Train A SI signal. Therefore, with "B" MDAFWP OOS, and the fact that the SAFWPs must be manually started, the applicants could think that no AFW pumps are running.

C. Incorrect. Only the "A" MDAFW Pump will be running because it will receive start signals (SG shrinkage and MFWP breakers open) and have power. Plausible because the applicants may wrongly believe that the "D" SAFWP would be aligned to Bus 16 (since the "B" MDAFWP is OOS) and would automatically start. The SAFWPs do not start on an SI signal and would need to be started manually.

D. Incorrect. Only the "A" MDAFW Pump will be running because it will receive start signals (SG shrinkage and MFWP breakers open) and have power. Plausible because the applicants may wrongly believe that the "D" SAFWP would automatically start on an SI signal. Furthermore, applicants may wrongly believe that only Train "B" components would start on a Train "B" SI signal (thus "A" MDAFWP would not start).

Technical References:	BIG NOTES: AFW-01, AFW-02, & 480V-01 AP-ELEC.14/16, LOSS OF SAFEGUARDS BUS 14/16 AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSSES
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Proposed References to be provided:	None
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Learning Objective	Lesson ID: R07010C Rev27
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Question Source:	New
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Question History:	NA
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7
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Comments:	
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Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	061 K3.02	
	Importance	4.2	

K/A Statement: Auxiliary/Emergency Feedwater - Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G

Question # 47

While taking mitigation actions in EOP-3, Steam Generator Tube Rupture, auxiliary feedwater cannot be re-established to the ruptured steam generator. Level has just dropped below the narrow range scale.

For this event, WHAT is the concern associated with ruptured SG level continuing to drop?

- A. Reinitiation of safety injection
- B. Loss of reactor coolant heat sink
- C. Dilution of the reactor coolant system
- D. Thermal shock of steam generator tubes

Answer: A

Explanation/Justification:

- A. Correct. After the RCS cooldown, if the steam space in the ruptured steam generator expands to contact these colder tubes, condensation will occur which would decrease the ruptured steam generator pressure. This in turn would reduce the reactor coolant subcooling margin and/or increase primary-to-secondary leakage, possibly delaying SI termination or causing SI reinitiation.
- B. Incorrect. Wrong because loss of heat sink is not a concern because AFW flow was only lost to the ruptured SG. (It is implied that AFW is still available to the other SG.) Plausible because loss of AFW flow can lead to the loss of heat sink but both SGs would have to lose AFW flow.

- C. Incorrect. Wrong because if the steam space in the SG collapses when exposed to the colder tubes, then pressure will drop in the SG and RCS will flow into the SG. Plausible because the applicant may assume that the SG pressure control would be lost if level continues to lower and therefore may cause SG inventory to flow into the RCS
- D. Incorrect. Wrong because nothing is stated in the question indicating that the conditions for a hot dry SG exist. Plausible because shocking the SG tubes is a concern for hot dry SGs. It is possible that the applicant may confuse the bases information between a SGTR and loss of heat sink.

Technical References: E-3 Background Document page 73-74

Proposed References to be provided: None

Learning Objective Lesson ID: REP03C

Question Source: New

Question History: NA

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 7
55.41 (a) 6

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	062 K2.01	
	Importance	3.3	

K/A Statement: AC Electrical Distribution – Knowledge of bus power supplies to the following:
Major system loads

Question # 48

The plant is holding reactor power steady at 75% power while mechanics replace bearings on Condensate Booster Pump 1C.

WHICH 4160V Bus loss will require the crew to implement AP-TURB.5, Rapid Load Reduction?

- A. Bus 11 A
- B. Bus 11 B
- C. Bus 12 A
- D. Bus 12 B

Answer: C

Explanation/Justification:

C. Correct. With 1C Condensate Booster Pump OOS at 75%, the other two condensate booster pumps will be running. The de-energization of the 12A Bus will result in a loss of Condensate Booster Pump 1A which will disrupt the secondary system requiring the crew to do a rapid load reduction.

A, B, and D. Incorrect. Wrong because the loss of either Bus 11A or B would result in a reactor trip due to loss of RCS flow requiring the crew to enter E-0. The loss of Bus 12B has no significant impact on plant operations. These choices are plausible because the applicant must understand what loads are on which bus and how a loss of these buses would impact plant operations in this situation.

References: Big Notes 4160V-01
AP-FW.1, ABNORMAL MFW PUMP FLOW OR NPSH
AP-TURB.5, RAPID LOAD REDUCTION

Proposed References to be provided: None

Learning Objective R0601C, 4160V AC, Enabling Objective 1.03
R0701C, 480V AC, Enabling Objective 1.06

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	063 K2.01	
	Importance	2.9	

K/A Statement: DC Electrical Distribution – Knowledge of bus power supplies to the following:
Major DC loads

Question # 49

The plant was at 100% power with normal system alignments when a loss of all AC power occurred.

What is the basis for degassing the main generator in ECA-0.0, Loss of All AC Power?

- A. To allow reducing load on the TSC Vital Battery
- B. To allow reducing load on the 125V Battery 1A or 1B
- C. To minimize the hydrogen seal leakage caused by the loss of all AC
- D. To minimize the likelihood of a main lube oil fire caused by loss of cooling

Answer: A

Explanation/Justification:

A. Correct. Hydrogen is vented so the air side seal oil pump can be secured. The TSC Vital Battery is the power supply for the pump. The pump is secured to minimize load on the battery.

B. Incorrect. Wrong because in normal system alignment, Batteries 1A or B would not be powering the air side seal oil pump. Plausible because the applicant may think that these could be the power supply for the pump.

C and D. Incorrect. Wrong because these are not the reasons stated in the background document. Plausible because the applicant may think in terms of fire protection.

Technical References: Big Notes Instrument Buses D/C-01

ECA-0.0, Loss of All AC Power, step 11
EOP Attachment 8.0, DC Loads
EOP Attachment 8.2 Gen Degas
ECA-0.0 Background Document, Step 17 and Note
Lesson ID: R0901C; Slides 101 & 107

Proposed References to be provided: None

Learning Objective Lesson ID: R0901C

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	063 A2.01	
	Importance	2.5	

K/A Statement: DC Electrical Distribution – Ability to (a) predict the impacts of the following malfunctions or operations on the DC electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Grounds

Question # 50

The plant is operating at 100% power. All systems are in a normal configuration

The following indications are received in the Control Room:

- Annunciator J-23, BATTERY BANK GROUND, has actuated
- Battery A Voltage indicates 98 volts

Which of the following describes the actions required for these conditions per Annunciator Response AR-J-23?

- A. Trip the Reactor and carry out the immediate actions of E-0, Reactor Trip or Safety Injection, then dispatch an operator to locally open the Generator Exciter Field Breaker.
- B. Refer to ER-ELEC.2, Recovery From Loss of A or B DC Train, and transfer DC Train A to the TSC Battery.
- C. Trip the Reactor and carry out the immediate actions of E-0, Reactor Trip or Safety Injection, then dispatch an operator to isolate DC Bus A from Battery A.
- D. Refer to ER-ELEC.2, Recovery From Loss of A or B DC Train, and dispatch an AO to check Battery Chargers to locate the ground and to check for positive or negative ground.

Answer: D

Explanation/Justification:

D. Correct. These are the actions described in Steps 4.1 and 4.2 of AR-J-23

A, B, C. Incorrect. Wrong because these choices contain incorrect system responses or actions. Plausible because the applicants may be unfamiliar with the system responses and/or the necessary actions. These choices contain various combinations of plausible plant responses or required actions.

Technical References: ER-ELEC.2, Rev 01502
AR-J-23, Rev 01101

Proposed References to be provided: None

Learning Objective

Question Source: Bank (Minor modification to reorder choices) Question ID:
1705165

Question History: N/A

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 5

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	064 A2.02	
	Importance	2.7	

K/A Statement: Emergency Diesel Generator – Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Load, VARS, pressure on air compressor, speed droop, frequency, voltage, fuel oil level, temperatures

Question # 51

A loss of offsite power occurred. Plant systems responded as designed. Offsite power will not be restored for two to three days. Load is 22% and steady on the 'A' Emergency Diesel Generator (EDG).

WHICH ONE of the choices below correctly describes the appropriate guideline regarding the continued operation of the 'A' EDG per T-27.4, Diesel Generation Operation?

- A. Maintain load greater than 25% to ensure exhaust stack discharge is clear.
- B. Maintain load greater than 50% to minimize possibility of erratic output frequency.
- C. Maintain load greater than 488 KW to minimize possibility of erratic output frequency.
- D. Raise load greater than 488 KW for one hour every 10 hours to ensure exhaust stack discharge is clear.

Answer: B

Explanation/Justification:

- A. Correct. Precautions 4.3 and 4.7 provide guidance raise/maintain load greater than 25%/488KW. The question and the precautions of this procedure were based upon lessons learned from INPO IER L2-11-46 (OE-2011-002780) "Extended Emergency Power Operations Following a Loss of Off-Site Power" INPO Recommendation #7 Response (Guidance for Light Load Operation). Maintaining EDG load greater than 25% will ensure the exhaust temperature remains high enough to prevent "souping" of lube oil in the exhaust

system, as evidenced by heavy black and gray smoke (not clear), thereby minimizing the chance for a fire.

- B. Incorrect. Wrong because if engine is required to operate for long periods at low loads, the load is to be raised above 50% for one hour. Plausible because the applicants may confuse the 25% and 50% recommendations.
- C. Incorrect. Wrong because the procedure cautions against extended runs below 25% loading. Plausible because the applicants may forget whether loading is to be above or below 25%. Also, frequency fluctuations at low EDG loads were addressed in INPO IER L2-11-46.
- D. Incorrect. Wrong because loading to remain consistently above 25% to prevent a fire hazard. Plausible because the applicants may confuse the warning about being greater than or less than 25% load and may also confuse the greater than 50% for one hour every 10 hour guidance with the minimum 488 KW threshold.

Technical References: T-27.4, Rev 04203, Section 4: Precautions
Lesson R0801C Slides 17-21, and 191-192

Proposed References to be provided: None

Learning Objective R0801C Enabling Objective 1.09

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 5
55.43 (a) 5
55.45 (a) 3 & 13

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	073 G2.1.20	
	Importance	4.6	

K/A Statement: Process Radiation Monitoring - Ability to interpret and execute procedure steps

Question # 52

The plant is at 100% power steady state operations when the following conditions are observed:

Annunciator A-5, CCW SURGE TANK HI LEVEL 58.8% is lit

CCW Radiation Monitor, R-17, is in alarm

VCT level is decreasing

Pressurizer level is on program

RCP seal leak off temperatures are 140°F

Seal leak off flows are 3.4 and 3.6 gpm

RCP "A" and "B" labyrinth seal d/p's are approximately 35"

Letdown flow is 45 gpm

Letdown pressure is approximately 250 PSIG

Letdown pressure control valve, PCV-135, demand is approximately 25% open

Nuclear Sample Room Heat Exchanger CCW Return Flow is 82 gpm

Nuclear Sample Room Heat Exchanger CCW Return Temperature is 94°F

WHICH ONE of the following actions is directed by the appropriate procedure for the event in progress?

- A. Isolate Normal letdown
- B. Isolate Sample Room Heat Exchanger(s)
- C. Close RCP Seal Return Isolation Valve MOV-313
- D. Close RCP Thermal Barrier CCW Return Valve AOV-754A(B)

Answer: A

Explanation/Justification:

- A. Correct. Correct because the plant conditions indicate a leak in the letdown system. A higher than normal letdown flow and the closing of the PCV-135 to maintain pressure are indicative of a leak in the non-regenerative heat exchanger. The applicant must be able to distinguish between normal and off-normal conditions to diagnose the event to take the correct actions per AP-CCW.1, Leakage into the Component Cooling Loop.
- B. Incorrect. Wrong because these actions are at the end of the procedure. The applicants would have to misdiagnose the leak in the letdown system to get to this point in the procedure. Plausible because these are actions contained within the procedure.
- C. Incorrect. Wrong because these actions would be taken if there was a seal return heat exchanger leak. Plausible because the applicants have to properly diagnose the event and this action would isolate seal return if the applicants thought that seal return pressure was higher than CCW pressure.
- D. Incorrect. Wrong because these actions would be taken if there was a thermal barrier leak. Plausible because the applicants have to properly diagnose the event and these actions are in the procedure to address a thermal barrier leak.

Technical References: AP-CCW.1, Leakage into the Component Cooling Loop.
 EOP Figure 4, RCP Seal Leakoff
 Reactor Coolant Pump Big Notes
 O-6.1, Equipment Operator Rounds and Log Sheets, Attachment 6

Proposed References to be provided: None

Learning Objective Lesson R2801C, CCW Enabling Objectives 1.10 & 1.11

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10
 55.43 (a) 5
 55.45 (a) 12

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	076 K1.19	
	Importance	3.6	

K/A Statement: Service Water - Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: SWS emergency heat loads.

Question # 53

A break occurs in the piping just downstream of Service Water A/B Loop Crosstie Isolation V-4623.

An AO has split the A & B SW Headers per Att.-2.5 Split SW headers

WHICH of the following heat loads downstream will still be affected by the break?

- A. Containment Coolers A & B and the Turbine Driven Auxiliary Feedwater Pump
- B. Containment Coolers C & D and the Motor Driven Auxiliary Feedwater Pump
- C. Safety Injection Pumps and Charging Pump Coolers
- D. Battery Room and Instrument Air Compressor Coolers

Answer: A

Explanation/Justification:

A. Correct. According to the Service Water Big Notes Drawing, Containment Coolers A & B and the Turbine Driven Auxiliary Feedwater Pump are downstream of the valve. The question requires applicants to know the layout of the SW system and how a break will affect downstream heat loads.

B, C, Incorrect. Wrong because although some of these heat loads are downstream of 4623 and would initially be affected by the leak, after isolating 4625, 4756 and 4739 they would no longer be affected by the break in the SW system. Plausible because the question requires the applicants to possess an understanding of the layout of the SW system and therefore they could confuse which loads are located on which part of the system.

D. Incorrect. The battery room and air compressor coolers are not downstream of 4623.

Technical References: Service Water Big Notes Drawing

Proposed References to be provided: None

Learning Objective Lesson R5101C, Service Water, Enabling Objective 106 & 108

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 2 - 9
55.45 (a) 7 - 8

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	078 K3.02	
	Importance	3.4	

K/A Statement: Instrument Air - Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Systems having pneumatic valves and controls

Question # 54

The reactor is at 49% power and the crew is increasing power to 100% IAW O-1.2, Plant Startup From Hot Shutdown to Full Load. All systems are in automatic.

Assuming no operator action, and considering each separately, if a loss of instrument air occurred to the following valves, WHICH would lead to a reactor trip?

- A. Heater Drain Pump Recirculation Valve AOV-3365
- B. Letdown AOV-427
- C. Charging Line Valve HCV-142
- D. Letdown Valve AOV-371

Answer: D

Explanation/Justification:

D. Correct. AOV-371 fails closed on a loss of IA. Without letdown, the PZR level would increase, due to charging and seal injection, to the High PZR Level trip set point.

A. Incorrect. Wrong because AOV-3365 fails open on a loss of IA. The HDTPs will trip after one minute with the recirc valve failed open. However, below 50% with two condensate pumps running, there would be no significant impact to feedwater flow or SG levels. Plausible because if power were above 50%, the crew would have to do a rapid load decrease to stabilize the secondary side and prevent a trip.

B. Incorrect. Wrong because AOV-427 fails open on a loss of IA and has no effect on letdown flow or inventory as it is located upstream of the orifice valves. Plausible because the

applicants make wrongly think that letdown valves would isolate on a loss of IA to conserve RCS inventory. This valve is an exception to that.

C. Incorrect. Wrong because HCV-142 fails open on a loss of IA. With HCV-142 full open, the only effect would be a loss of seal injection. RCP operation can continue with thermal barrier cooling in operation. Net flow into the RCS would be the essentially the same because of the PDPs. Any loss of inventory would be made up by the makeup system. Plausible because the applicants may wrongly think that with the valve full open, that PZR level would increase to the trip set point.

Technical References: EOP Attachment 11.0, IA Concerns
Big Notes CVCS
AP-FW.1, Abnormal MFW Pump Flow or NPSH

Proposed References to be provided: None

Learning Objectives: Lesson R1601C, CVCS, Enabling Objective 1.06, 1.10
Lesson 4701C, Instrument and Service Air, Enabling Objective 1.04

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7
55.45 (a) 6

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	103 K1.08	
	Importance	3.6	

K/A Statement: Containment – Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: SIS, including action of safety injection reset

Question # 55

A large break LOCA occurs in conjunction with a loss of offsite power.
 Emergency Diesel Generator 1A fails to start automatically.
 Containment Spray Pump (CSP) 1B fails to start and cannot be started.
 The crew has completed cold leg recirculation alignment.
 Containment pressure is 50 psig.
 RWST level is at 10%.
 Emergency Diesel Generator 1A has just now been restarted.

Which of the following flow paths are available to depressurize the containment using the sprays?

- A. Start CSP 1A and draw suction from the RWST.
- B. Align a portion of the RHR pump flow directly to the containment spray headers.
- C. Align RHR Pump 1A suction from Sump A and direct flow to CSP 1A.
- D. Align RHR Pump 1B suction from Sump B and direct flow to CSP 1A.

Answer: D

Explanation/Justification:

- D. Correct. For the given situation, ES-1.3 will align RHR suction from Sump B. (Sump B is protected from debris.) RHR injection can supply suction to the running spray pump to depressurize containment.

- A. Incorrect. Wrong because with RWST less than 15% there is not adequate suction available for a CNMT spray pump. Also this action is not directed by procedure. Plausible because applicants may believe that the RWST is a viable source of water at this point.
- B. Incorrect. Wrong because although there is a flow path via a 2" test line to the eductors, there is no direct path to the spray headers. Plausible because the applicants may confuse the test line for a flow path to the spray headers.
- C. Incorrect. Wrong because ES-1.3 will align RHR suction from Sump B not Sump A. Plausible because applicants may think that it is logical to use Sump A due to the power restoration on Train A components.

Technical References:

ES-1.3, Transfer to Cold Leg Recirculation
EOP Attachment 28.0, Containment Spray
Big Notes for RHR and Containment Spray

Proposed References to be provided:

None

Learning Objective

Lesson 2101C, CNMT, Enabling Objective 1.03
Lesson 2501C, RHR, Enabling Objective 1.03

Question Source:

New

Question History:

N/A

Question Cognitive Level:

Comprehension

10 CRF Part 55 Content:

55.41 (b) 2 – 9
55.45 (a) 7 - 8

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	001 K3.02	
	Importance	3.4	

K/A Statement: Control Rod Drive – Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: RCS

Question # 56

The plant is at 90% power steady state conditions.

Control Bank D is at 225 steps.

All systems are in automatic except Volume Control Tank (VCT) make up is in manual.

A dropped rod event occurs.

The plant stabilizes several minutes later with no operator action.

Which of the choices below correctly completes the statement describing the effect of the rod drop on pressurizer level and VCT level as compared to their respective pre-transient values?

Pressurizer level is _____ and VCT level is _____ .

- A. lower, higher
- B. higher, lower
- C. lower, the same
- D. the same, the same

Answer: C

Explanation/Justification:

A. Incorrect. A dropped rod will cause Tavg to lower. When Tavg drops, the PZR level will decrease due to lower density of the water and the pressurizer program level setpoint will also

lower with Tav_g. Therefore there is no need for makeup to the pressurizer and VCT level will remain constant.

B. Incorrect. Wrong. See justification for Choice A. Plausible because the applicant may reverse the effect of the dropped rod on the plant transient.

C. Correct. A dropped rod will cause Tav_g to lower. When Tav_g drops, the PZR level will decrease due to lower density of the water and the pressurizer program level setpoint will also lower with Tav_g. Therefore there is no need for makeup to the pressurizer and VCT level will remain constant. Per design, the pressurizer level will change in proportion to the RCS temperature change and the program level setpoint is varied with Tav_g accordingly, thereby minimizing generation of waste water. Rod Control in automatic would normally restore Tav_g to match T_{ref} within a band, which would cause the pressurizer level control system to restore pressurizer level to near the pre-transient level. However with rods at 225 steps, an outward motion rod block will prevent auto rod withdrawal.

D. Incorrect. See justification for Choice A. Plausible because the applicant may think that Rod Control in automatic will restore Tav_g to T_{ref}, which would cause the pressurizer level control system to restore pressurizer level to the pre-transient level. However with rods at 225 steps, an outward motion rod block will prevent auto rod withdrawal and therefore rods cannot restore Tav_g to its original value.

Technical References: Big Notes, Rod Control
 AP-RCC.2, RCC/RPI MALFUNCTION
 AP-Turb.2, TURBINE LOAD REJECTION

Proposed References to be provided: None

Learning Objective RAP29C, AP-RCC.3, Enabling Objective 2.01

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7
 55.45 (a) 6

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	015 G2.2.42	
	Importance	3.9	

K/A Statement: Nuclear Instrumentation – Ability to recognize system parameters that are entry-level conditions for Technical Specifications

Question # 57

During a Reactor Startup, the following conditions exist:

- Permissive P-6 has just energized.
- Source Range Channel N31 indicates 4×10^3 cps.
- Source Range Channel N32 indicates 5×10^3 cps.
- Intermediate Range Channel N35 indicates 2×10^{-11} amps.
- Intermediate Range Channel N36 indicates 2×10^{-10} amps.

WHICH ONE of the following statements is correct?

- A. Channel N35 is undercompensated. The startup can continue to Mode 1.
- B. Channel N36 is undercompensated. The startup cannot continue to Mode 1.
- C. Channel N35 is overcompensated. The startup can continue to Mode 1.
- D. Channel N36 is overcompensated. The startup cannot continue to Mode 1.

Answer: B.

Explanation/Justification:

B. Correct. IR N36 is undercompensated therefore it is inoperable and thus the startup cannot continue per TS 3.3.1 Function 3 and TS 3.0.4. Recognizing that a mode change cannot occur is testing the applicants' knowledge to recognize TS entry conditions.

A. Incorrect. Wrong because IR N35 is reading properly but Mode change is prohibited by TS because IR N36 is inoperable. Plausible because the applicant may misdiagnose the failure and

believe the startup can continue because only one of the two IRs greater than P-6 will allow the manual blocking of the SR trip.

C. Incorrect. Wrong because IR N35 is reading properly but Mode change is prohibited by TS because IR N36 is inoperable. Plausible because the applicant may misdiagnose the failure and believe the startup can continue because only one of the two IR's greater than P-6 will allow the manual blocking of the SR trip.

D. Incorrect. Wrong because IR N36 is undercompensated not overcompensated. Plausible because one IR is inoperable and a Mode change is prohibited by TS.

Technical References: Big Notes, NIS
TS 3.3.1 and 3.0.4

Proposed References to be provided: None

Learning Objective Lesson R3301C Enabling Objective 1.12

Question Source: Modified (from ID# 1703839)

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 7 & 10
55.43 (a) 2 & 3
55.45 (a) 3

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	016 K1.06	
	Importance	3.6	

K/A Statement: Nonnuclear Instrumentation – Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: AFW system

Question # 58

WHICH ONE of the following choices contains a list of conditions, each of which would result in the given auxiliary feedwater pump(s) running?

- A. Motor Driven Pumps: Safety Injection Signal
1 of 2 MFW pump breakers open
EITHER Steam Generator 2/3 levels < 17%
- B. Motor Driven Pumps: AMSAC Actuation
Safety Injection Signal
BOTH Steam Generators 2/3 level < 17%
- C. Turbine Driven Pump: AMSAC Actuation
Loss of Voltage on EITHER 11A or 11B Bus
EITHER Steam Generator 2/3 level < 17%
- D. Turbine Driven Pump: Safety Injection Signal
Loss of Voltage on BOTH 11A and 11B Buses
BOTH Steam Generators 2/3 level < 17%

Answer: B

Explanation/Justification:

- B. Correct. Correct because all of the conditions listed would result in the MDAFW pumps running. Either SG < 17% will provide a start signal for both pumps.

- A. Incorrect. Wrong because both MFW pump breakers must be open to generate a start signal for the MDAFW pumps.
- C. Incorrect. Wrong because the TDAFW pump does not start on an SI signal and both SG levels must be at or below the set point. Plausible because the applicants could confuse the start signals between the MDAFW pumps and the TDAFW pump.
- D. Incorrect. Wrong because both busses must be de-energized. Plausible because the applicants could confuse the start signals or the logic inputs between the MDAFW pumps and the TDAFW pump.

Technical References: Lesson 4201C, Aux Feedwater, slides 62 and 86
Big Notes Aux Feed

Proposed References to be provided: None

Learning Objective Lesson 4201C, Aux Feedwater, Enabling Objective 1.07

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 2 - 9
55.43 (a) 7 - 8

Comments: The question attempts to meet the KA by having the applicants understand the cause-effect relationship between SG level (NNIS) and the AFW system actuation signals.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	028 A2.01	
	Importance	3.4	

K/A Statement: Hydrogen Recombiner and Purge Control - Malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Hydrogen recombinder power setting, determined by using plant data book

Question # 59

Three days after a large break LOCA with containment H₂ concentration at 3.5%, the crew implements Procedure S-21.1, Hydrogen Recombiner A Purging and Operation. After achieving the desired normal combustor temperature, the block valve for the main fuel line fails closed.

Assuming no further operator action, what is the effect of this failure on combustor outlet temperature?

- A. Temperature will drop and stabilize at 1275 °F.
- B. Temperature will drop and stabilize at 600 °F.
- C. Temperature will drop and stabilize at 450 °F.
- D. Temperature will drop and stabilize below 287 °F.

Answer: D

Explanation/Justification:

D. Correct. The closure of the main fuel block valve will cause the combustion temperature to lower from 1400 °F. At 1275 °F the block and isolation valves for the pilot line will close and all combustion will stop. Temperature will eventually equalize with ambient conditions at combustor outlet where ambient containment temperature will be at or below design temperature of 286 °F.

A. Incorrect. Wrong because the loss of the main fuel line will starve the combustor of fuel and temperature will lower to ambient condition. Plausible because the applicants may remember a

parallel pilot fuel path to the combustor and wrongly assume that it was for redundancy. The main and pilot hydrogen shut off if temperature drops <1275 °F.

B. Incorrect. Wrong because temperature will continue to lower below 600 °F due to the lack of fuel. Plausible because the applicants may forget that all fuel is isolated to the combustor when temperature reaches 1275 °F. 600 °F is the temperature achieved by the combustor when it is fed by the pilot line.

C. Incorrect. Wrong because temperature will continue to lower below 450 °F due to the lack of fuel. Plausible because the applicants may be confused by the interlock that shuts off pilot line hydrogen on startup if temperature remains <450 °F at 60 seconds after start.

Technical References: S-21.1, Hydrogen Recombiner A Purging and Operation.
Lesson R6501C, H2 Recombiners, Slides 67, 72, 84, 89, 96, 114

Proposed References to be provided: None

Learning Objective: Lesson R6501C, H2 Recombiners, Enabling Objectives 2.01

Question Source: New

Question History: N/A

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 5
55.43 (a) 5
55.45 (a) 3 & 13

Comments: There is no plant data book for using a power setting for Ginna's recombiners. Combustion rate is based upon a targeted temperature. The temperature is controlled by fuel supplied to the combustor. A failure of the fuel line was intended to test the applicants' knowledge on the effect of system temperature and hence the ability to predict system response.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	034 K6.02	
	Importance	2.6	

K/A Statement: Fuel-Handling Equipment - Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System: Radiation monitoring systems

Question # 60

Given the following plant conditions:

The plant is in Mode 6.
 Refueling Activities are in progress in the Containment Building.
 Containment purge is in operation.
 While performing Daily Checks it is noted that the sample pump for R-11, Containment Air Particulate Monitor, is not running.

WHICH ONE of the following statements is applicable to this condition?

- A. R-11 is OPERABLE and refueling activities may continue. The sample pump is not normally running when purge is in service supplying sample flow.
- B. R-11 is INOPERABLE and refueling activities may continue as long as R-10A, Containment Iodine Monitor, is operable for Containment Vent Isolation.
- C. R-11 is INOPERABLE and refueling activities must be stopped due to Containment Vent Isolation Instrumentation being inoperable.
- D. R-11 is OPERABLE and refueling activities may continue. The Containment Air Particulate Monitor sample pump is only required for the RCS Leak Detection function of the monitor.

Answer: C

Explanation/Justification:

C. Correct. Since the pump is required to be in operation per LCO 3.3.5, CVI Instrumentation therefore is not OPERABLE and refueling activities must be halted until R-11 is made operable.

A. Incorrect. Wrong because R-11 is inoperable per LCO 3.3.5. Plausible because the piping arrangement of the sample lines from containment purge exhaust is pressurized to cause flow from containment to the atmosphere with a flow path to the R-11 monitor and the candidate can infer therefore that no sample pump is needed for sample flow.

B. Incorrect. Wrong because R-11 is inoperable and refueling cannot continue even if R-10A is operable. R-11 is required to be operable. Plausible because the applicants may wrongly believe that at least one of these monitors is required to be operable.

D. Incorrect. Wrong because R11 is inoperable nor is it applicable for the conditions given. Plausible because of explanation in distractor A and per ITS 3.4.15 is required for LCO compliance, however not applicable for the conditions given. R-11 inoperable makes the CVI instrumentation inoperable. The backup criticality monitoring is not lost when R-11 is inoperable.

Technical References:	ITS 3.3.5 & 3.9.3 ITS B 3.3.5
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Proposed References to be provided:	None
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Learning Objective	R3701 C 1.12, 1.13 RRF02C 5.0
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Question Source:	Bank
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Question History:	Last NRC Exam 2014 Question 62
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Question Cognitive Level:	Comprehension
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10 CRF Part 55 Content:	55.41 (b) 7 55.43 (a) 7
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Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	041 K4.11	
	Importance	2.8	

K/A Statement: Knowledge of SDS design feature(s) and/or interlock(s) which provide for the following: T-ave/T-ref program

Question # 61

Turbine load was reduced during night shift to 545 MW in preparation for main turbine stop valve testing, which is planned for later in the day. Then, with control rods in MANUAL, turbine load suddenly experiences a step drop of 93 megawatts. Which of the following statements below correctly describes operation of the condenser steam dump valves two seconds after this step load decrease?

- A. The steam dump controls will be responding to an open modulation signal.
- B. ALL steam dump valve groups will be responding to an immediate full open signal.
- C. The steam dump controls have NOT yet met all plant conditions needed to open valves.
- D. ONLY two steam dump valve groups will be responding to an immediate full open signal.

Answer: A

Explanation/Justification:

A. Correct

Steam dumps will modulate open due to loss of load P4 being energized, due to > 10% turbine load step decrease. The magnitude of the load decrease will immediately result in a Tavg – Tref error of 4.1°F, exceeding the dead band on the controller. The fractional turbine load change, 93/600 equals a 15.3% load change. Tavg ramps from 547°F at no load to 574°F at full load, a change of 27°F. The temperature error will initially be 15.3% of 27°F, or 4.1°F, greater than the nominal controller deadband of 4.0°F.

B. Incorrect.

Plausible because if temperature error increases above 11°F all steam dumps will go full open, however current plant conditions indicate a temperature error less than 11°F.

C. Incorrect.

Steam dump will modulate open due to loss of load P4 being energized. Plausible if applicant does not identify that conditions have been met to energize P4.

D. Incorrect.

Plausible because if temperature error increases above 7.5°F all steam dumps will go full open, however current plant conditions indicate a temperature error less than 7.5°F.

Technical References:

R4501C Steam Dump System - RG

Proposed References to be provided:

None

Learning Objective

R4501C Steam Dump System – RG; 107

Question Source:

New

Question History:

Question Cognitive Level:

Comprehension or Analysis

10 CRF Part 55 Content:

55.41 (b) 8

55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	071 A1.06	
	Importance	2.5	

K/A Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Waste Gas Disposal System operating the controls including: Ventilation system

Question # 62

Given the following:

- The plant is operating at 100% power.
- Gas Decay Tank release is in progress.
- The following alarm is received:
 - R14 VENT GAS

Which ONE of the following describes ALL of the automatic actuations that occur?

- A. ONLY RCV-14 closes. NO other actuations occur
- B. RCV-14 closes AND Aux Building Ventilation Isolation occurs ONLY
- C. Aux Building Ventilation Isolation occurs ONLY. NO other actuations occur
- D. RCV-14 closes; Aux Building Ventilation Isolation occurs; Waste Gas Compressors trip if running

Answer: B

Explanation/Justification:

A. Incorrect

This actuation does occur, but whether in Filter-In or Filter-Out, the Aux Building fans will also trip

B. Correct.

C. Incorrect.

If the R-14 alarm is received, RCV-14 will also close due to high radiation

D. Incorrect.

Plausible because the first 2 actuations do occur. Applicant may consider WG Compressor operation as a contributor towards the alarm. WG compressor trips typically on low pressure, not hi rad.

Technical References: R3801C
P-9, Radiation Monitor System

Proposed References to be provided: None

Learning Objective R3801C, 6.05

Question Source: Bank
Question History: (2011 SRO Retake)

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	072 K3.02	
	Importance	3.1	

K/A Statement: Knowledge of the effect that a loss or malfunction of the ARM system will have on the following: Fuel handling operations

Question # 63

Given the following conditions:

- A refueling outage has started
- Core off-load is in progress
- E-24, RMS Area Monitor High Activity, has actuated
- Operators have determined that the FAIL ALARM has actuated on Radiation Monitor R2, Containment Area Monitor
- Parts to repair R-2 are estimated to arrive on site in approximately 3 days

With R-2 failed, core off-load ...

- A. must be stopped until R-2 is restored to operability.
- B. may resume when a local monitor is installed on the manipulator bridge.
- C. may continue if R-7, In-Core Detectors Area Monitor, is operable.
- D. may continue if EITHER R-29 OR R-30, Containment High Range Monitor, is operable.

Answer: B

Explanation/Justification:

- A. Incorrect: Plausible because it is partially correct. However, the procedure allows a local monitor on the manipulator bridge to be substituted.
- B. Correct. CORRECT. 0-15.1 specifies either R-2 or a local monitor on the manipulator bridge.

C. Incorrect: Plausible because a substitute monitor is permitted. R-7 is a monitor inside containment but is NOT the designated substitute.

D. Incorrect: Plausible because a substitute monitor is permitted. R-29 and R-30 are monitors inside containment but are NOT the designated substitute.

Technical References: O-15.1

Proposed References to be provided: None

Learning Objective: R3701C; 1.09

Question Source: Bank

Question History: 2010 Ginna NRC Q35

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	075 K2.03	
	Importance	2.6	

K/A Statement: Knowledge of bus power supplies to the following: Emergency/essential SWS pumps

Question # 64

Plant conditions are as follows:

- The unit is at 100% power.
- "B" and "C" Service Water pumps are running.
- "A" and "D" Service Water pumps are selected.
- The normal supply breaker to Bus 17 fails open.

How will the Service Water System (SWS) pumps respond? (Assume no operator action.)

- A. "B" Service Water pump will trip and only "D" Service Water pump will start 40 seconds after the EDG breaker closes
- B. "B" Service Water pump will trip and only "D" Service Water pump will start 17 seconds after the EDG breaker closes
- C. "C" Service Water pump will trip and only "A" Service Water pump will start 40 seconds after the EDG breaker closes
- D. "C" Service Water pump will trip and only "A" Service Water pump will start 17 seconds after the EDG breaker closes

Answer: A

Explanation/Justification:

A. Correct

On an undervoltage the running SW pump will trip and only the selected SW pump will start for that train 40 seconds after "B" D/G breaker closes

B. Incorrect.

17 seconds is if there was a SI signal concurrent with an undervoltage condition

C. Incorrect.

Plausible if the applicant does not understand the power supply of the SW pumps, On an undervoltage the running SW pump will trip and only the selected SW pump will start for that train 40 seconds after EDG breaker closes

D. Incorrect.

Plausible if the applicant does not understand the power supply of the SW pumps and determines that SI signal was concurrent with undervoltage.

Technical References: LP R5101C, Service Water System

Proposed References to be provided: None

Learning Objective R5101C; 1.05, 1.07

Question Source: New

Question History:

Question Cognitive Level: Comprehensive

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	086 A4.06	
	Importance	3.2	

K/A Statement: Ability to manually operate and/or monitor in the control room: Halon system

Question # 65

The following alarms were received simultaneously on the Fire Control Panel in the Control Room:

- Z18 - Control Bldg. 271-0 Main Relay Room
- First Alarm SO5 - Control Bldg. 271-0 Rly Rm Computer Rm Auto Halon

What is the condition of the Halon system for the Relay and Mux room one minute after receiving these alarms?

- A. Halon system has not actuated.
- B. Halon system for Relay and Mux rooms has actuated
- C. Halon system for Relay room has actuated and Mux room has not actuated
- D. Halon system for Relay room has not actuated and Mux room has actuated

Answer: A

Explanation/Justification:

A. Correct

If the system had actuated, would have the following alarms: First Alarm, Second Alarm and Flow Alarm

B. Incorrect.

With only the first alarm in the Halon system will not actuate

C. Incorrect.

With only the first alarm in the Halon system will not actuate

D. Incorrect.

With only the first alarm in the Halon system will not actuate

Technical References: Fire Panel (FCP); SC-3.2.7 Immediate Action

Proposed References to be provided: None

Learning Objective R5901C; 1.02

Question Source: Bank

Question History:

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8

55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.1.7	
	Importance	4.4	

K/A Statement: Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Question # 66

Given the following:

- Due to a Fuel Handling Accident, radiation levels throughout the plant are trending up.
- Control Room (CR) Radiation Monitor alarms were received as follows:

(ARM = Area Radiation Monitor and PRM = Process Radiation Monitor)

0800 - R-1, CR ARM Warning Alarm comes in.
 0803 - R-45, CR PRM Warning Alarm comes in.
 0806 - R-46, CR PRM Warning Alarm comes in.
 0809 - R-46, CR PRM High Alarm comes in.
 0812 - R-1, CR ARM High Alarm comes in.
 0815 - R-45, CR PRM High Alarm comes in.

Assuming no action by the crew, which ONE of the following identifies the FIRST time that BOTH Trains of CREATS will be in the Emergency mode?

- A. 0803
- B. 0809
- C. 0812
- D. 0815

Answer: D

Explanation/Justification:

A. Incorrect

Plausible if unclear on which PRM alarm causes CREATs to go into the Emergency Mode.

B. Incorrect.

Plausible if unclear on how many PRM alarm causes CREATs to go into the Emergency Mode. It takes R-45 and R-46 to be in High alarm for both trains of CREATs to go into Emergency Mode.

C. Incorrect.

Wrong because CREATs goes into the Emergency mode on R-45 or R-46 not on R-1.

D. Correct.

Each train in alarm will start its related train of CREATS

Technical References:

AR-E-11, Cont. Rm. HYVAC Isol.
P-9, Radiation Monitor System

Proposed References to be provided:

None

Learning Objective

I2LP-ILO-EOPFRC 1

Question Source:

Bank

Question History:

Question Cognitive Level:

Comprehensive

10 CRF Part 55 Content:

55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.1.30	
	Importance	4.4	

K/A Statement: G2.1.30, Ability to locate and operate components, including local controls.

Question # 67

Given the following:

- A Loss of CCW has occurred.
- The crew is performing AP-CCW.2, Loss of CCW During Power Operation.
- An AO has been directed to verify normal CCW flows in accordance with ATT. 1.1, Attachment Normal CCW Flow.

Which ONE (1) of the following describes the local CCW flow indications that would be considered normal for the RCPs, and the location where flow would be manually throttled if required?

- A. 100 GPM; Containment Mezzanine.
- B. 100 GPM; Auxiliary Building Middle Level.
- C. 200 GPM; Containment Mezzanine.
- D. 200 GPM; Auxiliary Building Middle Level.

Answer: C

Explanation/Justification:

A. Incorrect

The Location where the flow would be manually throttled is correct, however the normal flow is not correct. The normal flow would be 200 gpm per attachment 1.1. 100 gpm is excess letdown hx flow.

B. Incorrect.

Flow and Location not correct, but plausible because the location where flow is read is from Auxiliary Building Middle level. The normal flow would be 200 gpm per attachment 1.1.

C. Correct.

The normal flow would be 200 gpm per attachment 1.1, and the location where flow would be manually throttled is correct.

D. Incorrect.

Normal CCW flow is correct, however the location is not correct. The location is plausible because this is the location where flow is read.

Technical References: ATT-1.1, Attachment Normal CCW Flow, Rev. 0

Proposed References to be provided: None

Learning Objective R2801C; 1.11a

Question Source: New

Question History:

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.2.13	
	Importance	4.1	3

K/A Statement: Equipment Control: Knowledge of tagging and clearance procedures.

Question # 68

Which ONE of the following parameters and associated values would REQUIRE a TAGOUT, based on the definition of a "Hazardous Energy" in accordance with OP-CE-109-101, Clearance and Tagging? (Assume NO instrument calibrations will be performed.)

Work on a(n) ...

- A. AC circuit with a maximum voltage of 50 volts AC.
- B. DC circuit with a maximum voltage of 40 volts DC.
- C. hydraulic system with a max pressure of 50 psig and a max temperature less than 120 °F.
- D. hydraulic system with a max pressure of 40 psig and a max temperature less than 120 °F.

Answer: A

Explanation/Justification:

- A. Correct. Per procedure a tagout is required for ≥ 50 volts (AC OR DC).
- B. Incorrect. Per procedure a tagout is required for ≥ 50 volts (AC OR DC).
- C. Incorrect. Per procedure a tagout is required for ≥ 60 psig hydraulic pressure and/or $> 120^{\circ}\text{F}$ temperature.
- D. Incorrect. Per procedure a tagout is required for ≥ 60 psig hydraulic pressure and/or $> 120^{\circ}\text{F}$ temperature.

Technical References: OP-CE-109-101, Rev 3

Proposed References to be provided: None

Learning Objective

Question Source: New

Question History:

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	G2.2.43	
	Importance	3.0	

K/A Statement: Equipment Control: Knowledge of the process used to track inoperable alarms.

Question # 69

A Control Room Annunciator window has a Black Dot sticker placed on it.

Which ONE of the following could be the reason for the Black Dot, in accordance with OPG-ANNUNCIATOR-FLAGGING?

- A. The annunciator is part of a tagout.
- B. The annunciator is a nuisance alarm.
- C. The annunciator is removed from service.
- D. An input to a multiple input annunciator is out of service.

Answer: B

Explanation/Justification:

- A. Incorrect
Per procedure a Red dot would be placed on the window to indicate that it is part of a tag.
- B. Correct.
Per procedure a Black dot would be placed on the window 1) for maintenance activity that causes a repeating alarm, 2) to identify a locked-in alarm caused by current station configuration, or 3) to identify nuisance alarms with the approval of the CRS.
- C. Incorrect.
Per procedure a Blue dot would be placed on the window to indicate it has been taken out of service.

D. Incorrect.

Per procedure a Yellow dot would be placed on the window to indicate that one or more inputs to a multiple input annunciator are out of service.

Technical References: OPG-ANNUNCIATOR-FLAGGING, Rev 2

Proposed References to be provided: None

Learning Objective I2LP-ILO-EOPFRC 1

Question Source: Modified

Question History:

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.3.4	
	Importance	3.2	

K/A Statement: Knowledge of radiation exposure limits under normal or emergency conditions.

Question # 70

The following Plant conditions exist:

- A LOCA outside Containment occurred 15 minutes ago
- The Shift Manager declared a SITE EMERGENCY
- The faulted line was manually isolated locally, however the NLO performing the task was injured and CANNOT leave the area on his own
- Initial dose estimates for the area are 75 R/hr primarily due to gamma radiation

If the EPA guideline (Emergency) limits are NOT exceeded voluntarily, which of the following choices is the maximum allowed time frame for rescuing the NLO?

- A. 3 to 4 minutes
- B. 6 to 8 minutes
- C. 9 to 20 minutes
- D. 0 minutes (rescue would NOT be allowed under voluntary limits)

Answer: C

Explanation/Justification:

- A. Incorrect
Plausible because per EP-CE-113 TEDE Limit of 5 Rem is controlled activity during the emergency limit.
- B. Incorrect.
Plausible because per EP-CE-113 TEDE Limit of 10 Rem is to protect valuable property.

C. Correct.

Per EP-CE-113 TEDE Limit of 25 Rem is for Lifesaving or protection of large populations.

D. Incorrect.

Plausible if determined that all of the TEDE limits have been exceeded and 75R/hr dose rate would not allow a rescue attempt.

Technical References:

EP-CE-113, Personnel Protective Actions, Rev 0

Proposed References to be provided:

None

Learning Objective

Question Source:

New

Question History:

Question Cognitive Level:

Comprehensive

10 CRF Part 55 Content:

55.41 (b) 8

55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.3.12	
	Importance	3.2	

K/A Statement: Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.

Question # 71

Plant conditions are as follows:

- The Reactor is critical and at 2% power.
- A containment entry is underway to look for a leak identified during the startup.
- The mechanic and contractor RP tech who are looking for the leak have informed the Control Room they have found a Boric Acid leak coming from the reactor cavity area.
- They request permission to enter the reactor cavity area and "A" sump to determine the extent of the Boric Acid leak.
- The contractor RP tech confirms that they both are wearing all the required dosimetry and has a portable radiation monitoring device with him that will cover the expected dose rates.

What is the correct personnel action in accordance with A-3, Containment Vessel Access Requirements?

- A. They may not enter either of the areas at this time.
- B. They may enter the "A" sump, but not the reactor cavity area.
- C. They may enter the reactor cavity area, but not the "A" sump.
- D. As long as the RP tech stays with the mechanic, they can enter both areas.

Answer: A

Explanation/Justification:

- A. Correct: Per A-3, Containment Vessel Access Requirements precaution 3.5: When the reactor is critical, personnel SHALL NOT enter the reactor cavity or A Sump.
- B. Incorrect: Entering sump might be possible with R.P support however procedurally not allowed.
- C. Incorrect: Entering reactor cavity area might be possible with RP support however procedurally not allowed.
- D. Incorrect: With RP coverage, lends validity to the possibility of entering either area however procedurally not allowed.

Technical References: A-3, Containment Vessel Access Requirements

Proposed References to be provided: None

Learning Objective RAD02C 1.02

Question Source: Bank

Question History: Last NRC Exam Ginna 2008 Q72

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 12

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.3.13	
	Importance	3.4	

K/A Statement: Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.

Question # 72

Plant conditions:

- The unit is at 90% power.
- All systems are in their normal alignment.
- Auxiliary Building (AB) Ventilation IMS Switch is in " FILTER IN".
- "C" Gas Decay Tank (GDT) is being released.

Which one of the choices below correctly completes the following statement.

If (1) goes into high alarm, "C" Gas Decay Tank release will automatically terminate and operators will (2).

- A. (1) R-13
(2) verify the GDT release AOV-RCV-014 to the plant vent closes, ensure 1F AB Exhaust fan is no longer running, and ensure 1A, 1B and 1C Intermediate Building Exhaust fans are no longer running
- B. (1) R-13
(2) verify the GDT release AOV-RCV-014 to the plant vent closes, ensure 1A, 1B, 1C and 1F AB Exhaust fans are no longer running, and ensure 1A, 1B and 1C Intermediate Building Exhaust fans are no longer running
- C. (1) R-14
(2) verify the GDT release AOV-RCV-014 to the plant vent closes, ensure 1F AB Exhaust fan is no longer running, and ensure 1A, 1B and 1C Intermediate Building Exhaust fans are no longer running
- D. (1) R-14
(2) verify the GDT release AOV-RCV-014 to the plant vent closes,

ensure 1A, 1B, 1C and 1F AB Exhaust fans are no longer running, and
ensure 1A, 1B and 1C Intermediate Building Exhaust fans are no longer running

Answer: C

Explanation/Justification:

- A. Incorrect. R-13 will cause this realignment of the AB exhaust system but it will not stop the Gas Decay Tank release so RCV-14 (the GDT release AOV to the plant vent) will not close
- B. Incorrect . R-13 will cause a realignment of the AB exhaust system but it will not stop the Gas Decay Tank release so RCV-14 (the GDT release AOV to the plant vent) will not close. This is correct if the Auxiliary Building (AB) filters are "OUT", but in the stem the Auxiliary Building (AB) filters are "IN", so the additional fans are not affected.
- C. Correct. With a high alarm on R-14 and the AB filters are "IN" the automatic actions that should occur are: RCV-14 (the GDT release AOV to the plant vent) closes. 1F AB Exhaust fan receives a trip signal. 1A, 1B and 1C Intermediate Building fans receive trip signals
- D. Incorrect. With a high alarm on R-14, RCV-14 (the GDT release AOV to the plant vent) closes. This is correct if the Auxiliary Building (AB) filters are "OUT", but in the stem the Auxiliary Building (AB) filters are "IN", so the additional fans are not affected

Technical References: LP R3901 C, Radiation Monitoring System pg. 18
LP R3801 C, Waste Disposal pg. 25

Proposed References to be provided: None

Learning Objective R3901 C Obj 1.03

Question Source: Bank

Question History: Last NRC Exam Ginna 2010 Q71

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 11

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.4.29	
	Importance	3.1	

K/A Statement: Knowledge of the Emergency Plan

Question # 73

The Shift Manager has declared a Site Area Emergency.

Which of the following activities is a responsibility of the HCO/CO during implementation of EPIP-1-3, SITE AREA EMERGENCY?

- A. Place the CREATS system in EMERGENCY mode.
- B. Assist in assessment of plant radiological conditions.
- C. Assist the Shift Manager in technical assessment of the emergency.
- D. When requested, be prepared to respond to NRC information requests.

Answer: A

Explanation/Justification:

- A. Correct: Per EPIP-1-3, Step 5.2.4, the HCO/CO is directed to place the CREATS system in the EMERGENCY mode by depressing one of the two pushbuttons (CR Manual Isolation A or B pushbuttons).
- B. Incorrect: Plausible because it is reasonable to expect that the HCO/CO could be utilized in this role. Incorrect because it's the responsibility of the Shift Chemistry Technician, as outlined in EPIP-5-7, p.16.
- C. Incorrect: Plausible because it is credible to believe that the HCO/CO might assist the SM by providing information to the CRS or SM, but the STA's primary function, as detailed in EPIP-5-7, p14, is to assist the SM in technical assessment.
- D. Incorrect: Plausible that the HCO/CO could be used to respond to NRC information requests, but this responsibility is assigned to the Emergency Coordinator and detailed in EPIP-5-7, p.10.

Technical References: EPIP-1-3, Site Area Emergency

Proposed References to be provided: None

Learning Objective RSC01C, 4.01

Question Source: Bank

Question History: Last NRC Exam Ginna 2013 Q#75

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.4.25	
	Importance	3.3	

K/A Statement: Knowledge of fire protection procedures.

Question # 74

Given the following:

- A fire has been reported in the Auxiliary Building Basement.
- The crew is responding per ER-FIRE.3, Alternate Shutdown for Aux Building Basement/Mezzanine Fire.
- ER-FIRE.3 directs closing MOV-856 on the west side of the RWST.

Which ONE of the following describes the reason for this action?

- A. To prevent RWST from potentially draining to Containment Sump B due to spurious operation of RHR Pump suction valves MOV-850A or 850B.
- B. To prevent inadvertent RCS boration due to spurious operation of RWST to Charging Pump suction valves LCV-112D and 112E.
- C. To ensure RWST suction to RHR Pumps is maintained in case of spurious operation of RHR system valves due to a hot short in the control circuitry.
- D. To align a boration flowpath to the suction of the Charging Pumps in case Emergency Boration Valve MOV-350 failure to operate due to a hot short in the control circuitry.

Answer: A

Explanation/Justification:

- A. Correct. ER-FI RE.3 Contains actions to locally close MOV 856 to prevent backflow to the sump in the event that the 850 valve were to inadvertently open due to a fire in this location.

- B. Incorrect. MOV 856 isolates RHR, not LCV-112 valves, but plausible because spurious operation is a concern and the VCT makeup valves are part of the concern.
- C. Incorrect. MOV-856 is used for isolation purposes, not maintaining operational flowpaths. Plausible because control room evacuation procedure does require manipulation of components to maintain conditions rather than to prevent conditions.
- D. Incorrect. MOV-856 is used for isolation purposes, not maintaining operational flowpaths. Plausible because control room evacuation procedure does require manipulation of components to maintain conditions rather than to prevent conditions.

Technical References: ER-FIRE.3

Proposed References to be provided: None

Learning Objective RER22c 10.00

Question Source: Bank

Question History: Last NRC Exam Ginna 2011 Retake (Q#65)

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	1
	Group #	1	1
	K/A #	G2.4.31	
	Importance	4.2	

K/A Statement: Knowledge of annunciator alarms, indications, or response procedures.

Question # 75

Given the following:

- A loss of all AC power has occurred.
- The crew is performing ECA-0.0, Loss of All AC Power.
- Power has NOT been restored.
- The following annunciators were lit 60 seconds prior to the loss of power
 - A-25, CONTAINMENT VENTILATION ISOLATION
 - A-26, CONTAINMENT ISOLATION

Which ONE (1) of the following describes the indication of the status of the components affected by these alarms, and the action performed to verify the status?

- A. Valve Status lights will be BRIGHT. Component status may also be verified using ATT 3.0, Attachment CI/CVI.
- B. Valve Status lights will be OFF. Component status must be verified using ATT 3.0, Attachment CI/CVI.
- C. Valve Status lights will be BRIGHT. Verification of position must also be performed using MCB valve position indication.
- D. Valve Status lights will be OFF. Manually initiate both CI and CVI and determine component status by their MCB valve position indication.

Answer: A

Explanation/Justification:

- A. Correct. IAW both ARPs
- B. Incorrect: Valve status lights should have DC power supplied
- C. Incorrect: Not IAW ARP's
- D. Incorrect: Valve status lights should have DC power supplied

Technical References:A-25, A-26

Proposed References to be provided: None

Learning Objective NA

Question Source: Bank

Question History: Last NRC Exam Ginna 2007 Q#49

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		1
	K/A #	APE 8 AA2.18	
	Importance		3.0

K/A Statement: Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Computer indications for RCS temperature and pressure.

Question # 76

The plant is operating at 100% power with plant parameters as indicated on the attached CET display printout. The crew notes pressurizer pressure and level dropping rapidly and initiates safety injection. After the crew transitions from E-0 to E-1, the STA observes:

- CETs 100°F above the values on the attached display
- RCS pressure 1200 psig and slowly rising
- Cnmt pressure 5.5 psig
- PRZR level 100%
- RVLIS fluid fraction 55%
- RCPs running

Which of the following is required?

- A. Remain in E-1.
- B. Immediately transition to FR-C.1.
- C. Immediately trip all RCPs.
- D. Immediately transition to FR-C.2.

Answer: D

Explanation/Justification:

A. Incorrect. Orange path FR-C.2 met.

B. Incorrect. Requires 1200 °F

C. Incorrect. Red or orange path FR is priority. Per BG document, running RCPs should not be stopped.

D. Correct. Orange path FR at 700 °F CETs

Technical References: F-0.2 CSFST
FR-C.2
FR-C.2 BG

Proposed References to be provided: CET display of 100% power conditions

Learning Objective RFRC2C, Obj 1.02

Question Source: New

Question History:

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		1
	K/A #	EPE 11 EA2.11	
	Importance		4.3

K/A Statement: Ability to determine or interpret the following as they apply to a Large Break LOCA: Conditions for throttling or stopping HPI.

Question # 77

A LOCA is in progress. The crew has just transitioned from E-1 to ES-1.1, SI Termination, after meeting all criteria.

Which of the following is a criterion for transition from E-1 to ES-1.1 that does not require a return to E-1 if the condition degrades after the transition?

- A. RCS subcooling > 0 °F
- B. SG NR level > 7% [25%] or feed flow > 200 gpm
- C. Pressurizer level > 10% [30%]
- D. CETs stable or decreasing

Answer: B

Explanation/Justification:

- A. Incorrect. ES-1.1 foldout criteria
- B. Correct. Required to leave E-1, not a return from ES-1.1
- C. Incorrect. ES-1.1 foldout criteria
- D. Incorrect. Not a transition criterion

Technical References: E-1, ES-1.1

Proposed References to be provided: none

Learning Objective

Question Source:

New

Question History:

Last NRC Exam NA

Question Cognitive Level:

Comprehension

10 CRF Part 55 Content:

55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		1
	K/A #	APE 22 AA2.04	
	Importance		3.8

K/A Statement: 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

Question # 78

The plant is operating at 100% with all parameters at programmed or design values. A loss of all charging occurs. The operator isolates letdown.

Assuming all parameters are initially at programmed or design values and with no OTHER operator actions, which of the following most closely states when the AOP directed reactor trip setpoint will be reached?

Note: steam tables provided

- A. 3.5 hours
- B. 5 hours
- C. 6 hours
- D. 8.25 hours

Answer: B

Explanation/Justification:

100% Program Level: 56%

Trip required at 5% pwr level by AP-CVCS.3

58.82 gals/% (3600 gal/61.2% from PPT Slide 35)

6 gpm RCP seal leakoff (cold) = 10 gpm (hot) out of pwr

58.82 gals/% / 10 gals/min = 5.882 min/% level decrease

51% total level decrease * 5.882 min/% level decrease = 300 minutes to reach 5%

- A. Incorrect. Right leak rate, wrong trip setpoint of 20% ($36\% * 5.882 \text{ min}/\% = 211.8 \text{ min}$, ~3.5 hours)
- B. Correct. See calculation above. 5 hours to lower level from 56% to 5% due to seal leakoff inventory loss. Requires knowledge of the procedurally directed trip setpoint.
- C. Incorrect. If applicant does not correct for temp, and thinks trip at 20%, low end of control band ($36\% * 9.8 \text{ min}/\% = 352.8 \text{ min}$, ~6 hours).
- D. Incorrect. If applicant does not correct for temp, calc based on 6 gpm = 9.8 min/% to 5% ($51\% * 9.8 \text{ min}/\% = 499.8 \text{ min}$, ~8.25 hours).

Technical References: AP-CVCS.3, Rev 14
R1401C, PZR & PRT PPT, Rev 25

Proposed References to be provided: Steam tables

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		1
	K/A #	EPE 29 G2.1.28	
	Importance		4.1

K/A Statement: ATWS. Knowledge of the purpose and function of major system components and controls.

Question # 79

A small break LOCA has occurred. The reactor failed to trip.
The following conditions exist:

- Reactor Power is 10% trending down.
- RCS pressure is 1200 psig trending down
- SG pressures are 1000 psig stable.
- SI has actuated properly except for AFW
- AFW failed to start manually or automatically

What action is required regarding the RCPs, and why?

- A. Trip RCPs due to meeting E-0 foldout page criteria.
- B. Leave RCPs in service - for core cooling due to FR-S.1 entry.
- C. Trip RCPs due to meeting FR-H.1 entry criteria.
- D. Leave RCPs in service – no trip criteria of any procedure are met at this time.

Answer: B

Explanation/Justification:

- A. Incorrect. RCP trip criteria are evaluated at E-0 step 14, FR-S.1 transition is step 1 RNO
- B. Correct. FR-S.1 caution

C. Incorrect. FR-S.1 priority

D. Incorrect. E-0 criteria are met.

Technical References: FR-S.1 and Background doc

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		1
	K/A #	W E12 G2.4.47	
	Importance		3.8

K/A Statement: Excessive Heat Transfer - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Question # 80

The plant was in MODE 2 following a refueling outage when indications were received of a high energy line break in containment.

The crew has transitioned to ECA-2.1, Uncontrolled Depressurization of Both Steam Generators. Field actions are underway to close the MSIVs. Operators stop SI pumps and shortly thereafter observe the following plant conditions:

- RCS pressure 1685 psig and steady
- Pressurizer level 36% and slowly rising
- 'A' SG pressure 17 psig and steady
- 'A' SG wide range level 3% and steady
- 'B' SG pressure 35 psig and slowly rising
- 'B' SG wide range level 6% and slowly rising
- Containment pressure 9.2 psig and lowering
- Subcooled margin 172°F and rising
- RHR Pumps running
- SI Pumps stopped

Which of the following is the next crew action?

- A. Transition to E-2, Faulted Steam Generator Isolation.
- B. Transition to E-3, Steam Generator Tube Rupture.
- C. Stop both RHR pumps.
- D. Start both SI pumps.

Answer: C

Explanation/Justification:

- A. Incorrect. E-2 foldout page transition criteria is specified as any SG pressure rising, except while performing SI Termination Steps 17 and 18. Indications show SI termination actions of Step 17 in progress. Plausible because the transition out of ECA-2.1 would be to E-2 following SG isolation if not performing SI termination steps.
- B. Incorrect. E-3 transition criteria given as uncontrolled SG level rise or abnormal radiation levels. Given conditions are consistent with successful secondary isolation of the 'B' SG. A tube rupture small enough to allow RCS pressure to continue to rise would not result in repressurization of a faulted SG. Plausible choice because WR level is rising.
- C. Correct. Stopping both RHR pumps is the next directed action in ECA-2.1 Step 17.
- D. Incorrect. SI pumps would only be restarted to address loss of primary inventory indications of lowering pressurizer level or subcooled margin. Plausible because Step 18 monitors for need to reinitiate and applicant may incorrectly a SGTR.

Technical References: ECA-2.1, Rev 03601

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		1
	K/A #	APE 057	G2.2.42
	Importance		4.6

K/A Statement: Loss of Vital AC Instrument Bus - Ability to recognize system parameters that are entry-level conditions for TS

Question # 81

Refueling operations are in progress.

The supply breaker to Instrument Bus C trips due to a sustained fault on the Instrument Bus. Maintenance has been dispatched to investigate and repair the fault.

From the Tech Spec LCOs listed below, select the answer choice that identifies **ALL** of the LCO conditions that are **REQUIRED** to be entered.

- 1) TS LCO 3.8.8 Condition A
- 2) TS LCO 3.8.10 Condition A
- 3) TS LCO 3.9.2 Condition A

Note: The referenced Tech Specs are provided.

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

Answer: B

Explanation/Justification:

- A. Incorrect. TS 3.8.8 and 3.8.10 conditions must be entered. TS 3.9.2 condition is not required to be entered.

- B. Correct. TS 3.8.8 and 3.8.10 conditions must be entered. TS 3.9.2 condition is not required to be entered.

Regarding TS 3.8.10 Condition, per TS 3.9.2, both Source Range Instruments are required in MODE 6. Instrument Bus C, which powers Source Range Instrument N-32 is lost. The crew must enter TS LCO 3.8.10 Condition A for the loss of a necessary subsystem of AC instrument bus power since Instrument Bus C supplies equipment required to be OPERABLE (SRNI N-32).

Regarding TS 3.8.8 Condition, although Inverter 1B, which normally feeds Instrument Bus C is not damaged, it must be considered INOPERABLE. Per the basis for TS 3.8.8, *"For an inverter to be OPERABLE, the associated instrument bus must be powered by the inverter with output voltage within tolerances with power input to the inverter from a 125 VDC power source."* The Inverter is INOPERABLE since it is not supplying its instrument bus. Therefore the crew must enter TS 3.8.8 Condition A.

Regarding TS 3.9.2 Condition, TS 3.0.6 states that *"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. Only the support system LCO ACTIONS are required to be entered."* It also states *"When a support system's Required Action directs a supported system to be declared inoperable or directs entry into Conditions and Required Actions for a supported system, the applicable Conditions and Required Actions shall be entered in accordance with LCO 3.0.2."* Both 3.8.8 and 3.8.10 provide alternative actions in place of declaring the associated support required feature inoperable. Therefore, in accordance with TS 3.0.6, although TS 3.9.2 could be entered per Action A.1 of TS 3.8.8 and 3.8.10, TS 3.9.2 is not required to be entered.

- C. Incorrect. TS 3.8.8 and 3.8.10 conditions must be entered. TS 3.9.2 condition is not required to be entered.
- D. Incorrect. TS 3.8.8 and 3.8.10 conditions must be entered. TS 3.9.2 condition is not required to be entered.

Technical References:	TS 3.0.6, TS 3.8.8, TS 3.8.10, TS 3.9.2 PZR & PRT PPT	
Proposed References to be provided:	TS 3.8.8 (pgs 3.8.8-1, -2), TS 3.8.10 (pgs 3.8.10-1, -2), TS 3.9.2 (pgs 3.9.2-1, -2)	
Learning Objective:		
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension]	

10 CFR Part 55 Content:

55.43 (b) 2

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		2
	K/A #	APE 28G2.1.28	
	Importance		4.1

K/A Statement: Pressurizer Level Control Malfunction: Knowledge of the purpose and function of major system components and controls

Question # 82

The plant is operating at 100% power.
The controlling pressurizer level channel fails high.

What is the long term effect on the plant with no operator action?
What is a Technical Specification referenced by ER-INST-1 for this malfunction?

- A. Reactor trip on High Pressurizer Level.
TS 3.4.9, Pressurizer.
- B. Reactor trip on High Pressurizer Level.
TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.
- C. Reactor trip on Low RCS Pressure.
TS 3.4.9, Pressurizer.
- D. Reactor trip on Low RCS Pressure.
TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

Answer: A

Explanation/Justification:

Transient response: The controlling pressurizer level channel fails high. Charging flow lowers in response. Pressurizer level drops until letdown isolates and heaters cut off, then level rises to the high level reactor trip setpoint, resulting in reactor trip.

A. Correct. Letdown isolates, PZR fills to trip. There are no applicable action requirements under the given conditions for either listed TS LCO. However, ER-INST.1 does direct

referencing TS 3.4.9 because it would apply if the instrument failed low. Detailed knowledge of which TS's are listed in ER-INST.1 is SRO knowledge.

B. Incorrect. No ESF on low level; applicant may think letdown isolation is ESF.

C. Incorrect. Applicant may think low level heater trip results in low press trip.

D. Incorrect. No ESF TS referenced.

Technical References: ER-INST.1; Inst Failure PPT slide 53

Proposed References to be provided: none

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 2,5

Comments:

Exam Outline Cross Reference:	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 59 AA2.05	
	Importance:	3.9	

K/A Statement: Accidental LRW Release – Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: The occurrence of automatic safety actions as a result of a high PRM system signal.

Question: #83

A radioactive liquid waste release is in progress. Liquid Waste Process Effluent Monitor R-18 was indicating 2.4E4 cpm when it suddenly rises to 3.6E5 cpm.

- 1) What action is required, and
 - 2) assuming the radiation monitor is determined to be inoperable, what compensatory action is required regarding the monitoring of release activity to allow the liquid release to continue?
- A.
- 1) Verify RCV-18 automatically closes.
 - 2) Per the ODCM, at least two independent samples taken at least 1 hour apart must be analyzed and determined to agree within a specified percentage of total activity in the tank.
- B.
- 1) Verify RCV-18 automatically closes.
 - 2) Per the ODCM, a grab sample must be analyzed once every 24 hours and determined to agree within a specified percentage of total activity in the tank.
- C.
- 1) Manually close RCV-18.
 - 2) Per the ODCM, at least two independent samples taken at least 1 hour apart must be analyzed and determined to agree within a specified percentage of total activity in the tank.
- D.
- 1) Manually close RCV-18.
 - 2) Per the ODCM, a grab sample must be analyzed once every 24 hours and determined to agree within a specified percentage of total activity in the tank.

Answer: A

Explanation / Justification

- A. Correct. Per ODCM 6.1.4, Action 2 for less than minimum channels operable requires two independent samples. RCV-18 is designed to close automatically on a R-18 high alarm. The high alarm is set at 72,000 cpm (7.2E4 cpm). The value given in the stem is 5 times higher than the alarm setpoint.
- B. Incorrect. Action listed is not correct for R-18 monitor. Plausible because the action contains elements of the correct answer and an action specified for clean system rad monitors
- C. Incorrect. Auto isolation should occur above alarm setpoint.
- D. Incorrect. Action listed is not correct for R-18.

Technical References:	ODCM AR-RMS-18, R-18 Liquid Waste P-9, Radiation Monitoring System, Rev 10000
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Proposed References to be provided:	None
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Learning Objective:

Question Source:	New
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Question Cognitive Level:	Comprehension
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10CFR Part 55 Content:	55.43 (b)4
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Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		2
	K/A #	APE 61	AA2.06
	Importance		4.1

K/A Statement: ARM - 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.

Question # 84

While evaluating historical test and maintenance records, the system engineer determines that High Range Containment Area Monitors R-29 and R-30 are both INOPERABLE.

What is the following is a required Tech Spec action?

- A. Restore R-29 AND R-30 to OPERABLE status within 30 days; if not, then immediately initiate a special report.
- B. Restore R-29 AND R-30 to OPERABLE status within 7 days; if not, then be in MODE 3 within 6 hours.
- C. Restore R-29 AND R-30 to OPERABLE status within 7 days; if not, then immediately initiate a special report.
- D. Restore R-29 AND R-30 to OPERABLE status within 30 days; if not, then be in MODE 3 within 6 hours.

Answer: A

Explanation/Justification:

- A. Correct. R-29 and R-30 are the two PAM Function10 containment high range area monitor channels. Tech Spec 3.3.3 allows separate condition entry for each function. TS LCO 3.3.3 Condition A would be separately entered for each monitor, separately tracking a 30 day completion time, beginning at the same time. If either monitor is not restored to OPERABLE within 30 days then an entry into Condition B would be required, with a required action of initiating a special report immediately.

- B. Incorrect. TS LCO 3.3.3 Condition D applies. Function 10 has two required channels and they are both INOPERABLE, which requires one of the channels restored to OPERABLE within 7 days. Both channels do not need to be restored within 7 days.
- C. Incorrect. Function 10 references Condition G for the special report, not Condition F for the shutdown to Mode 3.
- D. Incorrect. Function 10 references Condition G for the special report, not Condition F for the shutdown to Mode 3.

Technical References: TS table 3.3-1 function 10

Proposed References to be provided: TS 3.3.3 (pages 3.3.3-1 thru 3.3.3-4)

Learning Objective

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 11

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		1
	Group #		2
	K/A #	APE 67 AA2.05	
	Importance		3.6

K/A Statement: Ability to determine and interpret the following as they apply to the Plant Fire on Site: Ventilation alignment necessary to secure affected area

Question # 85

The plant is in MODE 3 preparing for startup when Damper BB-46-P in Battery Room B is declared INOPERABLE.

Which one of the following describes how the damper is operated and actions sufficient to ensure TS/TRM requirements are met for at least the next 72 hours?

- A. The damper is operated by fire suppression actuation. Within one hour the damper is placed in the closed position, Battery Room fire detectors are verified OPERABLE, and the damper is verified closed once per shift.
- B. The damper is operated by fusible links. Within one hour the damper is placed in the closed position, Battery Room fire detectors have been verified OPERABLE, and the damper is verified closed once per shift.
- C. The damper is operated by fire suppression actuation. The damper remains open; within one hour Battery Room fire detectors are verified OPERABLE and an hourly fire watch has been established on one side of the damper.
- D. The damper is operated by fusible links. The damper remains open; within one hour Battery Room fire detectors are verified OPERABLE and an hourly fire watch has been established on one side of the damper.

Answer: D

Explanation/Justification:

- A. Incorrect. No signal actuation of damper.
- B. Incorrect. No requirement to close damper.

C. Incorrect. No signal actuation of damper.

D. Correct. TRM 3.7.5.A and Table 3.7.5-1.

Technical References: TRM 3.7.5.A and Table 3.7.5-1
Vent PPT R2201C

Proposed References to be provided: none

Learning Objective

Question Source: Modified 1681401

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.45 (b) 5

Comments: Original Bank Q below.

Given the following plant conditions:

- The unit is in Mode 5, heating up to Mode 4
- Fire Damper BB-46-P in Battery Room B has just been declared INOPERABLE

Which of the following meets Technical Specification/TRM requirements for this condition?

Fire Damper BB-46-P ...

- A. must be placed in the closed position within one hour and then "B" Battery must be declared INOPERABLE.
- B. must be placed in the closed position within one hour. The unit must not enter Mode 4 until all fire barrier penetration seals are OPERABLE.
- C. can remain open but a continuous fire watch must be established on one side of the damper within one hour.
- D. can remain open. Verify all Battery Room "B" fire detectors OPERABLE within one hour then perform a once-per-shift fire watch inspection of "B" Battery Room

Answer: C

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		2
	K/A #	006 A2.06	
	Importance		3.5

K/A Statement: Emergency Core Cooling - 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: water hammer

Question # 86

The unit is operating at 100% power and the following conditions exist:

It is 1200 hours on 8/1/18.

"A" SI Pump is INOPERABLE due to repairs estimated to take 48 hours.

An audit of completed surveillance procedures has determined that the check for gas accumulation in the "B" SI Pump line was last performed 90 days ago.

WHICH ONE of the following describes the required action per Technical Specifications?

- A. Demonstrate "B" SI Pump OPERABLE by 1800 or be in MODE 3.
- B. Declare "B" SI Pump INOPERABLE at 1200. Enter TS 3.0.3 immediately.
- C. Demonstrate "B" SI Pump OPERABLE by 1200 on 8/2/18 or enter TS 3.0.3.
- D. Declare "B" SI Pump INOPERABLE if gas surveillance not performed by 1200 on 9/1/18.

Answer: D.

Explanation/Justification:

D. Correct. SR 3.5.2.8 was missed by two months. If it is discovered that a Surveillance was not performed within its specified frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. In this case, 31 days is the applicable limit. This delay period is permitted to allow performance of the Surveillance. Therefore, the "B" SI Pump is not inoperable.

A. Incorrect. Wrong because TS 3.0.3 would be entered immediately if both SI Trains were inoperable. Plausible because the applicants may wrongly believe that "B" SI Pump is inoperable because it has exceeded the surveillance time by approximately 200%.

B. Incorrect. Wrong because "B" SI Pump can go up to 31 days before being declared inoperable due to excessive gas accumulation in its line. Plausible because the applicants may wrongly believe the 6 hours completion time in Action B is applicable because the surveillance frequency was missed.

C. Incorrect. Wrong because "B" SI Pump can go up to 31 days before being declared inoperable due to excessive gas accumulation in its the line. Plausible because the applicant may wrongly apply the guidance of SR 3.0.3 and think that they have 24 hours to perform the surveillance.

Technical References: TS 3.5.2, ECCS
TS bases for 3.5.2, ECCS
TS Section 3.0, LCO and SR applicability
Surveillance Frequency Control Program, Rev 5

Proposed References to be provided: 1) TS 3.5.2, ECCS
2) Surveillance Freq Ctrl Program (page SFCP-8, showing only entries associated with TS LCO 3.5.2. Entries for other LCOs redacted.)

Learning Objective RTS000c ITS Overview
R2701C ECCS Enabling Objective 1.13

Question Source: Modified (Bank ID 1703853)

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5
55.45 (a) 5

Comments: The KA for this question pertained to the subject of water hammer impacting the ECCS. In order to address the KA for an SRO level question, the missed surveillance which is used to check for excessive gas build up in the ECCS line (which is for the prevention of water hammer per the TS bases) was introduced into the question. The rationale was that if this surveillance was missed for several months, then the likelihood of gas accumulation, and thus the occurrence of water hammer, would need to be addressed.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		1
	K/A #	012 A2.03	
	Importance		3.7

K/A Statement: Reactor Protection - Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Incorrect channel bypassing

Question # 87

The plant is at steady state 100% power when Containment Pressure Channel PI-945 fails high.

While implementing ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure, the crew used the wrong attachment and took actions to defeat bistables associated with the failure of Containment Pressure Channel PI-947.

WHAT actions should be taken by the crew?

- A. Implement E-0, Reactor Trip or Safety Injection, trip the RCPs, transition to ES-1.1, Safety Injection Termination and secure safety injection and containment spray pumps.
- B. Implement conduct of operations actions to back out of the wrong attachment and then address the failure of Containment Pressure Channel PI-945.
- C. Enter TS LCO 3.0.3 for two inoperable containment pressure channels and either restore one channel to operable status or enter O-2, Plant Shutdown.
- D. Implement E-0, Reactor Trip or Safety Injection, transition to ES-1.1, Safety Injection Termination, and secure safety injection pumps.

Answer: D

Explanation/Justification:

D. Correct. Given the conditions of the questions, an SI signal would be generated when the Containment Pressure Channel PI-947 was defeated in conjunction with PI-945 having already

failed high. The SI signal would generate a reactor trip and the crew would go to E-0 and then go to ES-1.1 and would secure the SI pumps. No containment spray actuation signal (CSAS) would be generated under these conditions. The question requires the applicants to understand 1) the containment pressure input logic for the SI and CSAS as 2) how the plant responds to the conditions of the question, and 3) the expected procedural flow path in response to these events.

A. Incorrect. Wrong because there is no CSAS that would require securing RCPs and containment spray pumps. Plausible because the applicants may confuse the containment pressure logic and think that the CSAS occurred.

B. Incorrect. Wrong because these actions would be pre-empted by an SI and reactor trip. Plausible because the applicants may confuse the SI and CSAS logic and wrongly conclude that neither SI nor CSAS occurred and therefore they only need to recover from implementing the wrong attachment.

C. Incorrect. Wrong because these actions would be pre-empted by an SI and reactor trip. Plausible because the applicants may confuse the SI and CSAS logic and wrongly conclude that neither SI nor CSAS occurred and therefore they only need to address TS.

Technical References: P-7, Safety Injection and Containment Spray Systems
E-0, Reactor Trip or Safety Injection
ES-1.1, Safety Injection Termination
ER-INST.1, Reactor Protection Bistable Defeat After
Instrumentation Loop Failure
Big Notes: Containment Spray

Proposed References to be provided: None

Learning Objective Lesson R3501C, Reactor Protection System Enabling Objective 1.07

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5
55.43 (a) 5
55.45 (a) 3 & 5

Comments: The question pertains to safeguard action signals. The licensee's lesson plan for RPS encompasses safeguard action signals.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		1
	K/A #	022 A2.04	
	Importance		3.2

K/A Statement: Containment Cooling - Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of service water

Question # 88

The plant is at 100% power steady state.

Service Water Pumps A and C were initially in service.

Service Water Pump B is started.

Service Water Pump A is then secured in preparation for changing the oil.

Shortly thereafter, Alarm C-10, Containment RECIRC CLRS Water Outlet LO Flow 1050 GPM, actuates. Conditions are as follows:

Loop A Service Water pressure is 44 psig and stable.

Loop B Service Water pressure is 70 psig and stable.

Containment Sump Level A is _____ (less than 10" and stable – see licensee for typical value).

Containment Recirculation fan collector dump frequency is _____ (licensee provide typical value).

Service water pump discharge pressures are as follows:

SWP A: 44 psig

SWP B: 44 psig

SWP C: 70 psig

SWP D: 0 psig

Containment recirculation fan service water flows are as follows:

Fan A: 600 gpm

Fan B: 550 gpm

Fan C: 1350 gpm

Fan D: 1375 gpm

WHAT action should be taken by the crew?

A. Implement Attachment 2.2, SW Isolation, and Attachment 2.3, SW Loads in Cnmt.

- B. Implement AP-SW.1, Service Water Leak, and restart the Service Water Pump A.
- C. Implement E-0, Reactor Trip or Safety Injection and pull-stop Diesel Generator A.
- D. Implement Attachment 2.2, SW Isolation, and AB-TURB.5, Rapid load Reduction.

Answer: B

Explanation/Justification:

B. Correct. The conditions above are trying to create symptoms consistent with SWP A's discharge check valve being stuck open. There is a note in AB-SW.1 about a stuck open check valve. Step 3 RNO directs starting a third SWP if pressure is less than 45 psig (implying re-starting SWP A) to address this situation.

A. Incorrect. Wrong because there are no definitive symptoms of a SW leak inside containment that would indicate a need to address a cooler leak. Plausible because applicants may misdiagnose plant conditions and implement Attachment 2.3, SW Isolation, is mentioned as a possible action in AP-SW.1.

C. Incorrect. Wrong because although SW conditions are degraded, they do not meet the criteria to initiate a reactor trip. Plausible because the applicants may confuse the guidance contained in AB-SW.1 (pull-stop effected diesel generator) and wrongly go to E-0.

D. Incorrect. Wrong because although SW conditions are degraded, they do not meet the criteria to initiate a controlled shutdown. Plausible because the applicants may confuse the guidance contained in AB-SW.1 (implement Attachment 2.2, SW Isolation) and wrongly go to AB-TURB.5.

Technical References: AB-SW.1, Service Water Leak

Proposed References to be provided: None

Learning Objective Lesson R5101C, Service Water, Enabling Objective 1.11

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 5
55.43 (a) 5
55.45 (a) 3 & 13

Comments: Need to check with license to ensure reasonable values are provided for SW flows and pressures, sump level, and start frequencies.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		1
	K/A #	059 G2.4.35	
	Importance		4.0

K/A Statement: Main Feedwater - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects

Question # 89

The plant is at 100% power steady state conditions with all systems in automatic.

Feedwater Pump 1A suction flow instrument fails low.

WHAT action, if any, should be taken by the crew?

- A. Initiate action per AR-H-17, Feed Pump Net Positive Suction Head, to close Condensate Bypass Valve AOV-3959.
- B. Enter AP-FW.1, Abnormal MFW Pump Flow or NPSH, and direct AO to close MFW Pump Recirc Valve AOV-4147.
- C. Initiate power reduction per AP-TURB.5 Rapid Load Reduction, and direct AO to close Condenser Hotwell Recirc Valve AOV-4262.
- D. Enter AP-FW.1, Abnormal MFW Pump Flow or NPSH, start all AFW pumps, and initiate power reduction AP-TURB.5, Rapid Load Reduction.

Answer: B

Explanation/Justification:

B. Correct. When the MFW pump suction flow instrument fails low, the associated recirc valve will open and divert feedwater from the SG's. Level deviations and/or flow mismatches will occur prompting the crew to enter AP-FW.1 where the US will need to direct the AO to locally close the recirc valve.

A. Incorrect. Wrong because the referenced alarm response procedure does not direct closing the bypass valve. Plausible because the alarm may actuate and the bypass valve may open in

response to the opening of the pump recirc valve at full power. Differentiating between Choices A and B require detailed SRO level knowledge of the associated procedures.

C. Incorrect. Wrong because although the crew could implement AP-Turb.5 to reduce load, there is no procedural guidance directing the local closure of AOV-4262. Plausible because the applicants may confuse the local closing of AOV-4262 with the guidance to close AOV-4147 as well as the fact that AOV-4262 being open is an entry condition for AP-FW.1.

D. Incorrect. Wrong because with all other systems functioning properly there will be no need to start any AFW pumps. Plausible because the applicants may wrongly think that these procedurally directed steps in AP-FW.1 are necessary.

Technical References:

Big Notes CondFeed
Big Notes SGWLCC
AP-FW.1, Abnormal MFW Pump Flow or NPSH

Proposed References to be provided: None

Learning Objective Lesson R3401C Condensate and Feedwater, Enabling Objectives 1.02, 1.06 and 1.07

Question Source: New

Question History: N/A

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.41 (b) 10
55.43 (a) 5
55.45 (a) 13

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		1
	K/A #	064 G2.2.38	
	Importance		4.5

K/A Statement: Emergency Diesel Generator - Knowledge of conditions and limitations in the facility license.

Question # 90

Given the following plant conditions:

Plant is operating at 100% power.

Bus 14 Normal Feeder Breaker has tripped OPEN.

Control Operator reports Bus 14 voltage is 0 volts.

Annunciator L-5, Safeguard Bus Main Breaker Overcurrent Trip, is alarming.

WHAT are the MINIMUM actions required to restore the "A" Emergency Diesel Generator (EDG) to OPERABLE status?

- A. Identify and isolate the fault per ER-ELEC.1, Restoration of Offsite Power.
- B. Identify and isolate the fault, place the normal supply breaker to AFTER TRIP and then to CLOSE and then depress the Overcurrent RESET push button for Bus 14 per ER-D/G.1, Restoring D/Gs.
- C. Identify and isolate the fault and then depress the Overcurrent RESET push button for Bus 14 per ARP-L-5, Safeguard Bus Main Breaker Overcurrent Trip.
- D. Place the "A" EDG supply breaker in Pull Stop, identify and isolate the fault, depress the Overcurrent RESET push button for Bus 14, and return "A" EDG supply to Auto per ARP-L-5, Safeguard Bus Main Breaker Overcurrent Trip.

Answer: C

Explanation/Justification:

C. Correct. In accordance with Technical Specification 3.8.1 Basis "A DG is considered

OPERABLE when: The DG is capable of starting, accelerating to rated speed and voltage, and connecting to its respective 480V safeguards buses on actuation of Loss of Power (LOP) DG Instrumentation within 10 seconds". Also stated "Any 480V bus fault which opens and/or prevents closure of the breakers from offsite power or the DGs requires declaring the offsite power source or DG inoperable, as applicable." To allow the DG to perform these functions, according to AR-L-5, it is necessary to identify and isolate the faulted component and then depress the Overcurrent RESET pushbutton for the bus normal feed breaker. This question tests the applicants' knowledge of the definition of an operable EDG and what actions are necessary to restore operability. The question is based upon a similar question from the last Ginna exam and will require the applicants to closely read and answer the question.

A. Incorrect. Wrong because this action alone will not allow the EDG to automatically close onto the bus. Plausible because the applicants may forget about the need to reset and/or the requirement for the EDG to be able to automatically close onto the bus.

B. Incorrect. Wrong because it is not necessary for the normal supply breaker switch to be cycled. Plausible because the applicants may confuse the actions for bus restoration with the actions needed to restore EDG operability.

D. Incorrect. Wrong because although this is the procedurally correct way to restore the bus without the EDG automatically starting, cycling the EDG output breaker switch is beyond the minimum actions required to restore operability. Plausible because this is the correct way to restore the bus.

Technical References:

ARP-L-5
TS Basis 3.8.1

Proposed References to be provided:

None

Learning Objective

Lesson R0801C EDGs Enabling Objectives 1.12 & 1.13

Question Source:

Modified (from Ginna 2017 exam question 88)

Question History:

Last NRC Exam: Ginna 2017 Question 88

Question Cognitive Level:

Comprehension

10 CRF Part 55 Content:

55.41 (b) 7 & 10
55.43 (a) 1
55.45 (a) 13

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		2
	K/A #	014 A2.04	
	Importance		3.9

K/A Statement: 014A2.04, Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Misaligned rod

Question # 91

Assume the following plant conditions following a transient from 100% power:

- 90% power
- T avg = 569°F
- Group counter Bank D = 205 steps
- MRPI Rod C7 Bank D = 188 steps
- MRPI Rod K7 Bank D = 176 steps
- MRPI Rods G3 and G11 Bank D = 200 steps
- C-5, PPCS ROD SEQUENCE OR ROD DEVIATION, alarm lit
- F-29, PPCS AXIAL OR QUADRANT POWER TILT, alarm lit
- Rods are believed to be trippable
- The crew has entered AP-RCC.2, RCC/RPI Malfunction

Which one of the following describes the required action per AP-RCC.2?

- A. Withdraw control rods to restore Tavg to program
- B. Insert Bank D to 200 steps and then realign rod K7
- C. Shutdown per 0-2.1, PLANT SHUTDOWN TO HOT SHUTDOWN
- D. Perform applicable portions of STP-0-1, ROD CONTROL SYSTEM

Answer: C

Explanation/Justification:

A. Incorrect

Plausible because control rod insertion is allowed for temperature control, but withdrawal is NOT allowed. Incorrect because with Tavg low, turbine load would be adjusted (lowered) to raise Tavg back to Tref value.

B. Incorrect.

Plausible if the applicant is not familiar with rod alignment indications and AP-RCC.2, and believes rod K7 meets alignment requirements (within 12 steps of G3 and G11) and there is a single misaligned rod. Incorrect because alignment is MRPI compared to the associated step counter.

C. Correct.

Per ITS 3.1.4, Shutdown and control rods are OPERABLE if the rod is within alignment and trippable. They are INOPERABLE because they don't meet the surveillance requirement for alignment. AP-RCC.2 requires a load reduction for a single misaligned rod and a plant shutdown for >1 rod misaligned.

D. Incorrect.

Plausible because AP-RCC.2 directs verification of control rod operability per STP-0-1 during post rod recovery. Incorrect because this action would be valid only for a single misaligned rod. With 2 misaligned rods, a shutdown per 0-2.1 is required.

Technical References:	AP-RCC.2
Proposed References to be provided:	None
Learning Objective	R3001C 1.06,1.10,&1.11
Question Source:	Bank
Question History:	
Question Cognitive Level:	Memory or Fundamental
10 CRF Part 55 Content:	55.41 (b) 8 55.43 (b) 8
Comments:	

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		2
	K/A #	035 A2.01	
	Importance		4.6

K/A Statement: 035A2.01, Ability to (a) predict the impacts of the following malfunctions or operations on the GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulted or ruptured S/Gs

Question # 92

Given the following conditions:

- A reactor trip and safety injection have occurred.
- RCS pressure is 1600 psig and LOWERING.
- PZR level is offscale LOW.
- Tavg is 500°F and LOWERING.
- Containment pressure is 4.5 psig and RISING.
- SG "A" pressure is 620 psig and LOWERING.
- SG "B" pressure is 600 psig and LOWERING.

Which of the following procedure flowpaths will be used to mitigate the event following EOP 0, "Reactor Trip or Safety Injection"?

- A. E-1, "Loss of Reactor or Secondary Coolant" and then E-2, "Faulted Steam Generator Isolation."
- B. E-2, "Faulted Steam Generator Isolation" and then E-1, "Loss of Reactor or Secondary Coolant."
- C. E-2, "Faulted Steam Generator Isolation" and then ECA 2.1, "Uncontrolled Depressurization of Both Steam Generators."
- D. E-1, "Loss of Reactor or Secondary Coolant" and then ECA 2.1, "Uncontrolled Depressurization of Both Steam Generators."

Answer: C

Explanation/Justification:

- A. Incorrect
Plausible due to E-1 is entered from E-0 and if applicant does not assess step 15 of E-0 correctly and enter E-1 from step 17.
- B. Incorrect.
Plausible if applicant assess step 15 of E-0 correctly but does not assess that both steam generators are faulted and determines need to go to E-1 based on E-2.
- C. Correct.
E-2 is entered from E-0, momentarily and then transitioned to ECA 2.1 based on step 2, both steam generators are faulted.
- D. Incorrect.
Transition to ECA 1.2 occurs from E-2. E-1 would not be entered due to the size of the breaks.

Technical References: E-0, E-1, E-2, & ECA 1.2 (Procedures and Bases)

Proposed References to be provided: None

Learning Objective REP02C; EO 1.2 & 2.1

Question Source: New

Question History:

Question Cognitive Level: Comprehension or Analysis

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		2
	Group #		2
	K/A #	G2.4.21	
	Importance		4.3

K/A Statement: G2.4.21, Knowledge of the parameters and logic used to assess the status of safety functions including:

1. Reactivity control
2. Core cooling and heat removal
3. Reactor coolant system integrity
4. Containment conditions
5. Radioactivity release control.

Question # 93

Plant conditions:

- A Steam Generator Tube Rupture is in progress.
- Complications were observed while performing E-3, Steam Generator Tube Rupture.
- The crew is performing ECA-3.2, SGTR with Loss of Reactor Coolant - Saturated Recovery Desired.
- SI Pumps 'A' and 'C' are running.
- RCS subcooling is 0°F.
- RCP 'B' is running.
- RCS fluid fraction is 55%.
- PRZR level is off-scale low.

Which ONE of the following describes the condition of the INVENTORY CSF Status Tree, and the required and/or acceptable action for the condition?

INVENTORY CSF Status Tree is ...

- A. GREEN because Safety Injection Pumps are operating. If the Status Tree turns yellow, the CRS will remain in ECA-3.2.
- B. YELLOW because Pressurizer level is low. The CRS may perform FR-1.2, Response to Low Pressurizer Level, at CRS discretion.
- C. YELLOW due to voiding in Reactor Vessel. The CRS may perform FR-1.3, Response to Voids in the Reactor Vessel, at CRS discretion.

- D. YELLOW due to voiding in the Reactor Vessel. The Status Tree has turned yellow but the CRS will remain in ECA-3.2.

Answer: A

Explanation/Justification:

- A. Correct
Yellow Path for Inventory will not exist if SI is in service. If Yellow path existed, then it would not be implemented due to conflict with ECA-3.2.
- B. Incorrect.
Yellow Path does not exist with SI pumps running, and action would be normal for yellow conditions, but not for current conditions
- C. Incorrect.
Plausible because there is a low water density, but with RCP running, FR-1.1 cannot be reached
- D. Incorrect.
Plausible because there is a low water density, but with RCP running, FR-1.1 cannot be reached. However, actions are correct for this conditions

Technical References:

Proposed References to be provided: None

Learning Objective RFRI3C Obj 2.01, 1.01

Question Source: Bank

Question History: 2010 NRC Examination

Question Cognitive Level: Comprehension or Analysis

10 CRF Part 55 Content: 55.41
55.43 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		1
	K/A #	G2.1.36	
	Importance	4.1	4.1

K/A Statement: G2.1.36, Knowledge of procedure and limitations involved in core alterations.

Question # 94

Which event provides the bases for the minimum boron concentration required to maintain shutdown margin while moving irradiated fuel assemblies during a core offload?

- A. Loss of RHR
- B. Boron dilution
- C. Shutdown LOCA
- D. Dropped fuel assembly

Answer: B

Explanation/Justification:

A. Incorrect

The loss of RHR would require water level.

B. Correct.

Correct per TS Bases 3.9.1, "The boron concentration limit specified in the COLR ensures that a core keff of ≤ 0.95 is maintained during fuel handling operations and that a core keff of < 1.0 is maintained during a boron dilution event."

C. Incorrect.

Shutdown LOCA would require makeup capability and minimum water requirements.

D. Incorrect.

Dropped fuel assembly requires hatches secured and cavity water level.

Technical References:

TS Bases 3.9.1

Proposed References to be provided: None

Learning Objective RTS00C

Question Source: New

Question History:

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		
	K/A #	G2.1.42	
	Importance		3.4

K/A Statement: G2.1.42, Knowledge of new and spent fuel movement procedures.

Question # 95

Given the following:

- The plant is in Mode 6.
- Core off-load is in progress.
- The New Fuel Elevator is being used for temporary storage of an irradiated fuel assembly.

Which ONE of the following describes the restrictions placed on refueling activities in this condition?

- A. Fuel movement in Containment may continue with the exception of placing irradiated assemblies on the Fuel Transfer Cart; Fuel movement in the SFP must be pre-approved by a Fuel Handling Deviation.
- B. All fuel handling activities must be discontinued in the SFP AND Containment until the irradiated assembly has been removed from the New Fuel Elevator.
- C. ALL movement of irradiated fuel within the SFP AND Containment must be pre-approved by a Fuel Handling Deviation while the irradiated assembly is in the New Fuel Elevator.
- D. Fuel movement in the SFP is NOT allowed with an irradiated fuel assembly in the New Fuel Elevator; Refueling activities in Containment may continue.

Answer: D

Explanation/Justification:

- A. Incorrect. Plausible because having an assembly is an abnormal condition and the applicant may believe that the transfer cart may not be sent to the SFP.

- B. Incorrect. Plausible because activities may not proceed in SFP, and it is logical to assume that all fuel movement would be stopped.
- C. Incorrect. Plausible because this is an abnormal condition, and abnormal movements would normally be approved with a deviation.
- D. Correct. Per RF-301, P&L 4.14 Fuel movement within the SFP is NOT allowed when an irradiated fuel assembly is located in the new fuel elevator.

Technical References: RF-301

Proposed References to be provided: None

Learning Objective R3701C

Question Source: Bank

Question History: 2011 SRO Retake Examination

Question Cognitive Level: Memory or Fundamental

10 CRF Part 55 Content: 55.41 (b) 8
55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		
	K/A #	G2.2.18	
	Importance		3.9

K/A Statement: Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.

Question # 96

Given the following:

- RCS reduced inventory operation is in progress.
- A new open CNMT Penetration #10 is about to be established and assigned to Operator A.
- Estimated closure time of Penetration #10 is 7 minutes.
- Time to Boil is 15 minutes.
- 3 Responsible Individuals are assigned to the Containment Closure Deviation Status:
 - Operator A - total of 5 minutes assigned
 - Operator B - total of 12 minutes assigned
 - Operator C - total of 13 minutes assigned

After Operator A is assigned an additional action to close Penetration #10, WHICH ONE of the following identifies 1) the effect on the Most Limiting Total Estimated Closure (ML TEC) Time, AND 2) the MAXIMUM allowable ML TEC?

The ML TEC time will (1) and the MAXIMUM allowable ML TEC time is (2) minutes.

- A. (1) remain the same
(2) 15
- B. (1) remain the same
(2) 120
- C. (1) rise
(2) 15
- D. (1) rise
(2) 120

Answer: A

Explanation/Justification:

- A Correct: 1st part correct, 2nd part correct. According to Attachment 1 of O-2.3.1A (p61-63, Rev 027) the ML TEC will remain at 13 minutes because there are three individuals that are assumed to be working in parallel, and Operator C has a total of 13 minutes. Consequently, the Operator C work is the most limiting. Also according to Attachment 1 of O-2.3.1A (p61-63; Rev 027), the ML TEC must be less than 120 minutes or the Time-To-Boil (whichever is less)..
- B. Incorrect: 1st part wrong, 2nd part wrong. See A and D.
- C. Incorrect: 1st part correct, 2nd part wrong. This is incorrect because the maximum ML TEC is 15 minutes, not 120 minutes. This is plausible because procedurally the maximum ML TEC can be as high as 120 if the Time-To-Boil were greater than 2 hours.
- D. Incorrect: 1st part wrong, 2nd part correct. This is incorrect because ML TEC will remain the same, not rise. This is plausible because the operator may not understand the concept of ML TEC

Technical References: O-2.3.1A, Attachment 1, Rev 027

Proposed References to be provided: None

Learning Objective ROP14C 1.02

Question Source: Bank

Question History: Last NRC Exam Ginna 2014 Q96

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		
	K/A #	G2.2.38	
	Importance		4.5

K/A Statement: Knowledge of conditions and limitations in the facility license.

Question # 97

Which of the following is a violation of an RCS safety limit with the shortest required time to restore compliance.

- A. RCS pressure is 2740 psig with the reactor at 2% power.
- B. RCS cooldown rate > 100 °F in one hour during a steam fault.
- C. RCS Tavg is 620 °F and one PORV is cycling after a load rejection.
- D. RCS pressure spikes to 2745 psig after an automatic reactor scram.

Answer: D

Explanation/Justification:

- A. Incorrect: One hour to restore in Modes 1 and 2.
- B. Incorrect: Not a safety limit.
- C. Incorrect: one hour to restore DNB safety limit.
- D. Correct: >2735 psig in Modes 3, 4, and 5 must be corrected within 5 min.

Technical References: TS 2.0, COLR

Proposed References to be provided: None or TS figure 2.1.1-1

Learning Objective

Question Source: New

Question History:	New
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.43 (b) 2
Comments:	

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		
	K/A #	G2.3.6	
	Importance		3.8

K/A Statement: Ability to approve release permits

Question # 98

The "A" Monitor Tank was sampled at 1700 on Monday and the analysis was completed for subsequent release. The initiation of the release has been delayed.

Considering the four times listed below, which of the choices identifies ALL of the times at which the release could be initiated with no restrictions?

1. 1900 Monday
 2. 2300 Monday
 3. 0400 Tuesday
 4. 1700 Tuesday
- A. 1 ONLY
- B. 1 and 2 ONLY
- C. 1, 2, and 3 ONLY
- D. 1, 2, 3, and 4

Answer: C

Explanation/Justification:

- A. Incorrect: Although this falls within the 12 hours limit, it does not identify ALL of the times at which the release could be initiated with no restrictions.

- B. Incorrect: Although this falls within the 12 hours limit, it does not identify ALL of the times at which the release could be initiated with no restrictions.
- C. Correct: Per S-3.4K, the release may be initiated, provided no more than 12 hours have elapsed since the sample. 1, 2, and 3 are all within 12 hours of the 1700 Monday sample.
- D. Incorrect: At time 4 there is a restriction: The release may only be initiated, with chem tech approval, provided the conditions that existed when the permit was made still exist.

Technical References: CH-700

Proposed References to be provided: None

Learning Objective RSEOOS, 5.04

Question Source: Bank

Question History: Last NRC Exam Ginna 2012 Q#92

Question Cognitive Level: Fundamental

10 CRF Part 55 Content: 55.43 (b) 4

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		
	K/A #	G2.4.18	
	Importance		4.0

K/A Statement: Knowledge of the specific bases for EOPs

Question # 99

FR-C.1, Response to Inadequate Core Cooling, allows starting an RCP even without all required support conditions with CETs greater than 1200 °F. Prior to doing so, a check of steam generator level in the loop to be started is performed.

Which one of the following identifies (1) the required level, and (2) the reason for the required level?

- A. (1) NR > 7% [25% adverse CNMT]
(2) to ensure adequate SG inventory for core heat removal.
- B. (1) NR > 7% [25% adverse CNMT]
(2) to protect SG tubes from high temperature creep rupture.
- C. (1) WR > 120 inches [160 inches adverse CNMT]
(2) to ensure adequate SG inventory for core heat removal.
- D. (1) WR > 120 inches [160 inches adverse CNMT]
(2) to protect SG tubes from high temperature creep rupture.

Answer: B

Explanation/Justification:

- A. Incorrect: right level, wrong reason
- B. Correct: per FR-C.1 background for EOP STEP 23 / ERG STEP 18
- C. Incorrect: wrong level, plausible because F&B level.
- D. Correct: wrong level, plausible because F&B level

Technical References: FR-C.1; background for EOP STEP 23 / ERG STEP 18

Proposed References to be provided: None

Learning Objective

Question Source: New

Question History: New

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #		3
	Group #		
	K/A #	G2.4.40	
	Importance		4.5

K/A: Knowledge of SRO responsibilities in emergency plan implementation

Question # 100

Given the following conditions:

- A Steam Generator Tube Rupture (SGTR) occurs; the CRS orders a reactor trip and SI.
- The reactor fails to trip from the control room, but is successfully tripped locally.
- The Atmospheric Steam Dump Valve (ASDV) on the ruptured SG cycles multiple times until the RCS cooldown commences.

How are these occurrences classified?

- A. The ATWT is a SITE AREA EMERGENCY (SAE). The SGTR w/ASDV cycling is an SAE.
- B. The ATWT is an SAE. The SGTR w/ASDV cycling is an ALERT.
- C. The ATWT is an ALERT. The SGTR w/ASDV cycling is an SAE.
- D. The ATWT is an ALERT. The SGTR w/ASDV cycling is an ALERT. The combined events are augmented to an SAE.

Answer: B

Explanation/Justification:

- A. Incorrect: cycling ASDV is not a loss of containment barrier
- B. Correct:
- C. Incorrect: ATWT no trip from CR is SAE
- D. Incorrect: events are not combined

Technical References: ECG & EP-CE-111

Proposed References to be provided: None

Learning Objective

Question Source: New

Question History: New

Question Cognitive Level: Comprehension

10 CRF Part 55 Content: 55.43 (b) 5

Comments: