Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

1 **ID: 2504667** **Points: 1.00**

Unit 1 is experiencing a hydraulic ATWS with power at ~ 10%. The CRS has directed T-210, Inserting Control Rods with the RWM Bypassed, to insert control rods.

Which one of the following correctly completes the below statement concerning the rod block(s) that currently exist?

The inability to insert control rods is due to the rod pattern not matching the rod pattern required by the RWM with ____(1)_____ flow rate below the LPSP of ____(2)____.

	(1)	(2)
A.	Total Steam	2.083 Mlbm/hr (~13.9 %)
B.	Total Steam	4.196 Mlbm/hr (~28 %)
C.	Total Feedwater	2.083 Mlbm/hr (~13.9 %)
D.	Total Feedwater	4.196 Mlbm/hr (~28 %)

Answer: A

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Answer Explanation

From S06.1.I U/1

• **Rod Worth Minimizer**:
NOTES
1. On decreasing power, LPAP is 4.196 Mlb/hr [ ]
2. On increasing power, LPAP resets at 4.495 Mlb/hr
- Steam Flow > LPAP: Display box is solid green when total steam flow is > LPAP Box is clear with green outline when flow is < LPAP
NOTES
1. On decreasing power, LPSP enforces at 2.083 Mlb/hr [ ]
2. On increasing power, LPSP resets at 2.382 Mlb/hr
- Steam Flow > LPSP: Display box is solid green when total steam flow is > LPSP Box is clear with green outline when flow is < LPSP

From LGSOPS0073B

2. **Below Low Power Setpoint (LPSP)** : <15.9%
Reactor Power, as sensed by the Total Steam Flow signal from the Digital Feedwater Level Control
System (DFWLCS)
a. The Rod Worth Minimizer (RWM) monitors each control rod selection and requested movement.
b. It compares the selection and movement called for to a prescribed sequence of control rod movements.
c. If the request is not in accordance with the prescribed sequence, control rod blocks will be applied.
1) The control rod block is initiated when the RWM removes the rod motion permissive signal from the Rod Drive Control System (RDCS)
3. **Between LPSP and Low Power Alarm Point (LPAP)**: (15.9 to 30%)
a. The RWM still functions to provide indications for out of sequence control rods but will not impose rod sequence control rod blocks. (RWM failures can cause rod blocks)

ANSWER (A)	**Total Steam, 2.083 Mlbm/hr (~13.9 %): Correct** as described above
DISTRACTOR (B)	**Total Steam, 4.196 Mlbm/hr (~28 %): Wrong**, Plausible because steam flow is the input to the RWM system, and this is the steam flow corresponding to the Low Power Alarm Point. At this power, however, the RWM will provide alarms and lists of out of sequence rods but will not block rod movement.
DISTRACTOR (C)	**Total Feedwater, 2.083 Mlbm/hr (~13.9 %): Wrong,** plausible because the power level (steam flow) is correct and because the feedwater system provides the input to the RWM. Incorrect because the RWM receives its input from total steam flow.
DISTRACTOR (D)	**Total Feedwater, 4.196 Mlbm/hr (~28 %): Wrong**, Plausible because the input is provided to the RWM via the Feedwater System, and this is the value for steam flow corresponding to the Low Power Alarm Point. Incorrect because the RWM receives its input from total steam flow

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Question 1 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504667
Version ID:	3185281
User-Defined ID:	Q #01 BANK
Cross Reference Number:	CLOSED
Topic:	RWM - System Bypass
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	The K/A is to monitor automatic operation including system bypass. This system auto-bypasses when power is above the LPSP); in that case the RWM automatically bypass rod blocks and only notes misposition errors. During an incomplete scram condition, the RWM will begin enforcing when steam flow drops below that value. The Candidate must recognize the impact on the RWM rod blocks when the Rx power goes either above or below the LPSP..
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	201006 A3.06 3.3
KA Statement	Ability to monitor automatic operation of the (SF7 RWMS) ROD WORTH MINIMIZER SYSTEM including: System bypass
Cognitive level	High
Safety Function	7
10 CFR 55	41.7
Technical Reference with Revision No:	T-210, Rev.015 S06.1.I Rev.006
Question History: (i.e. LGS NRC-05)	NRC 2019 Q #24
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0073B.04

Test Answer Key

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2 **ID: 2495410** **Points: 1.00**

Unit 2 is operating at 100% power when a feedwater malfunction results in the following:

- Reactor level begins lowering
- 207-H1 REACTOR WATER LEVEL BELOW LEVEL 3 TRIP is alarmed
- Both RPS trip systems remain energized
- The feedwater system stabilizes level at +10.5 inches

The RO scrams the reactor and the CRS directs the RO and PRO to perform their Reactor Scram Hard Cards per OT-200

15 minutes later Reactor power is 6% with Rx level at -75 inches steady.

Which one of the following alarms is **NOT** expected for current plant conditions?

A. 210-A1, “DIV 1 ADS OUT OF SERVICE”

B. 217-A1, “HPCI OUT OF SERVICE”

C. 213-B5, “CORE SPRAY LINE INTERNAL BREAK”

D. 208-H1, “SLCS STORAGE TANK LO-LO LEVEL, PUMP TRIP INITIATED”

Answer: D

Answer Explanation

For the given conditions, scram condition present with power >downscale, the crew actions are to insert a manual scram. When is this ineffective, the CRS direction is to perform OT-200 hard cards for RO and PRO. The multiple actions will have the combined effect to initiate RRCS and set the plant up for operation at a lower water level (T-270). The various actions will result in alarms associated with initiating SLC, inhibiting ADS, preventing HPCI injection. They are expected.

ANSWER (D)	2**08-H1, "SLCS STORAGE TANK LO-LO LEVEL/PUMP TRIP" is correct:** All the other alarms are correct for plant conditions. This alarm is due to SLC tank being effectively empty which is expected after extended SLC operation. It would not occur within 15 minutes of initiation. 2 pumps pumping at 43 gpm for 15 minutes = 1290 gallons. The SLC tank capacity is approx. 3900 gallons at normal level.3900-1290 is approx. 2600 gallons. The Low-Low level alarm is for the tank empty.
DISTRACTOR (A)	**210-A1, "DIV 1 ADS OUT OF SERVICE" is wrong:** This alarm is plausibly not expected in these conditions because inhibiting ADS is directed in T-117, ATWS RPV Control, which has three legs that are executed in parallel requiring the CRS to prioritize actions to control power, level and pressure for the existing plant conditions. For the plant conditions provided in the stem, water level is stable at + 10.5 inches; therefore, inhibiting ADS in the level control leg would not be a priority in T-117. Incorrect because the PRO hard card will inhibit ADS causing this alarm
DISTRACTOR (B)	**217-A1, "HPCI OUT OF SERVICE" is wrong:** This alarm is plausibly not expected in these conditions because HPCI can be used during an ATWS per strategies document OP-LG-103-102-1002. However, the PRO hard card directs that HPCI be isolated per T-270.
DISTRACTOR (C)	**213-B5, "CORE SPRAY LINE INTERNAL BREAK" is wrong:** This alarm is plausibly not expected in these conditions because SLC will not initiate if Rx power is downscale. The provided initial power in the stem was at 100% and is now much lower (6%); however, it is still above 4% which would ensure that SLC initiated

The use **NOT** in the stem of the question is allowable per NUREG-1021 rev.12. Section ES-4.2

Test Answer Key

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Question 2 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495410
Version ID:	3192551
User-Defined ID:	Q #02 NEW
Cross Reference Number:	CLOSED
Topic:	ATWS Alarms Consistent
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295037 G2.4.46 4.2
KA Statement	SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: EMERGENCY PROCEDURES / PLAN Ability to verify that the alarms are consistent with the plant conditions
Cognitive level	High
Safety Function	1
10 CFR 55	41.10
Technical Reference with Revision No:	OT-200 App. 1 Rev.001 OT-200 App. 12 Rev.000
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.02

Test Answer Key

Final SRO exam 11-27-23
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3 **ID: 2504125** **Points: 1.00**

Unit 2 is operating at 100% reactor power

Both Recirc pumps are running at 1250 RPM

- The 2B Reactor Recirc Pump ASD supply breaker trips

The following indications are observed:

- Reactor power has dropped to 62%
- Recirc Loop "A" Jet Pump flow 65 Mlbm/hr
- Recirc Loop "B" Jet Pump flow 15 Mlbm/hr
- "A" Recirc Loop Drive flow 40 Mlbm/hr

No operator actions have been taken

WHICH ONE of the following represents actual Core Flow?

A. 40 Mlbm/hr

B. 50 Mlbm/hr

C. 65 Mlbm/hr

D. 80 Mlbm/hr

Answer: B

Answer Explanation

ANSWER (B)	**50 Mlbm/hr is correct:** On a trip of a Recirc pump, the operating pump would drive additional flow through the core and with speed greater than 1125 RPM, some of that additional flow would force water through the idle loop jet pumps in a reverse direction. The flow instrumentation would register the flow and the subtraction circuit would eliminate its input into total core flow therefore 65 mlbm (A Loop) - 15 Mlbm (B Loop) = 50 Mlbm.
DISTRACTOR (A)	**40 Mlbm/hr is wrong:** Plausible because drive flow represents the majority of the total flow passing through the core and is a lower value than Recirc loop A jet pump flow provided in the stem, as expected due to the operation of the subtraction circuit. Also, the sum of the A loop drive flow and the B loop Jet Pump flow is 65 Mlbm/hr which matches to the value provided for the A Loop Jet Pump flow provided in the stem. Incorrect because drive flow only includes the flow through the Recirc pump, it does not include additional flow entrained in the jet pumps and as such, understates core flow significantly
DISTRACTOR (C)	**65 Mlbm/hr is wrong:** Plausible because at RRP speeds lower than 1125 RPM, the discharge head of the RRP would be lower and core bypass flow would also be lower or cease. Incorrect because at higher RRP speeds (>1125 RPM) as provided in the stem, the discharge head of the pump causes a portion of this flow to bypass the core and push reverse flow through the idle loop jet pumps
DISTRACTOR (D)	**80 Mlbm/hr is wrong:** Plausible because during normal operation Core Flow is the sum of the A loop Jet Pump Flow summed with B loop jet pump flow. Incorrect because the B loop Jet Pump flow is subtracted from the A loop Jet Pump flow under the conditions provided in the stem.

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Question 3 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504125
Version ID:	3192728
User-Defined ID:	Q #03 NEW
Cross Reference Number:	CLOSED
Topic:	Recirc Pump Runback Flow Measurement
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	216000 K6.07 3.1
KA Statement	Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF7 NBI) NUCLEAR BOILER INSTRUMENTATION: Loss of a recirculation pump
Cognitive level	Low
Safety Function	7
10 CFR 55	41.7
Technical Reference with Revision No:	OT-112 Rev.065 GP-15 Rev.002
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1540.05

Test Answer Key

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4 **ID: 2495419** **Points: 1.00**

Both units are operating at 100% power when the following occurs:

· A fire develops in the 11 Unit Auxiliary Transformer with fire suppression actuation causing Fire Main pressure to drop to 98 psig.

SE-8, "FIRE" is entered

WHICH ONE of the following describes the status of the fire pumps?

A. ONLY the Diesel Driven Fire Pump is running

B. ONLY the Motor Driven Fire Pump is running

C. Both the Motor Driven and Diesel Driven Fire Pumps are running

D. Neither the Motor Driven nor the Diesel Driven Fire Pumps are running

Answer: B

Answer Explanation

SE-8 references S.22.8.A and S.22.8.B. Per S.22.8.A, the motor driven fire pump auto starts at 100 psig, and per S.22.8.B, the diesel driven fire pump auto starts at 95 psig

ANSWER (B)	**ONLY the Motor Driven Fire Pump is running is correct:** The MDFP will auto start when is the Fire Header pressure drops to 100 psig as described above.
DISTRACTOR (A)	**ONLY the Diesel Driven Fire Pump is running is wrong:** Plausible because the MDFP start setpoint is 100 psig and this is just the reverse of the expected pump start sequence. Incorrect because the DDFP starts at 95 psig
DISTRACTOR (C)	**Both the Motor Driven and Diesel Driven Fire Pumps are running is wrong:** Plausible because this would be correct if the value of fire water header pressure provided in the stem was 3 psig lower and because both pumps normally start when a fire suppression system initiates. At the given header pressure, however, only the MDFP has a start signal.
DISTRACTOR (D)	**Neither the Motor Driven or Diesel Driven Fire Pumps are running is wrong:** This would be correct if the value of fire water header pressure provided in the stem remained above 100 psig. Also plausible because 95 psig is the start setpint for the DDFP and both pumps normally start when a fire suppression system initiates. Incorrect, however, because, at 98 psig, only the MDFP would start

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Question 4 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	2.50
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495419
Version ID:	3185286
User-Defined ID:	Q #04 BANK
Cross Reference Number:	CLOSED
Topic:	FIRE Pumps Pressure
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	600000 AK2.06 3.8
KA Statement	PLANT FIRE ON SITE Knowledge of the relationship between the (APE 24) PLANT FIRE ON SITE and the following systems or components: Fire Pumps
Cognitive level	High
Safety Function	8
10 CFR 55	41.8 / 41.10
Technical Reference with Revision No:	SE-8 Rev.067 ARC-MCR-004 B-2 Rev.07 ARC-MCR-004 A-1 Rev.09
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0022.04A

Test Answer Key

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5 **ID: 2495367** **Points: 1.00**

Limerick Unit 1 is operating at 100% power with the following conditions:

ST-6-055-230-1, "HPCI Pump, Valve and Flow Test" is in progress

- 1B RHR is operating in Suppression Pool cooling mode
- A SPOTMOS bulk temperature indicates 95 °F up slow
- B SPOTMOS bulk temperature indicates 96 °F up slow

WHICH ONE of the following describes the required action(s)?

A. Enter T-102, "Primary Containment Control" and suspend testing before suppression pool temperature reaches 105 °F.

B. Enter T-102, "Primary Containment Control", IMMEDIATELY suspend testing and place 2nd loop of Suppression Pool cooling in service

C. Enter T-102, "Primary Containment Control", IMMEDIATELY suspend testing ONLY

D. Suspend testing before Suppression Pool temperature reaches 105 °F, ONLY. T-102, "Primary Containment Control" entry is NOT required

Answer: A

Answer Explanation

ANSWER (A)	**Enter T-102, "Primary Containment Control" and suspend testing before suppression pool temperature reaches 105 °F is correct:** The ST-6-055-230-1 lays out the requirements in the precautions section. Step 3.8 "IF Supp Pool Temp reaches 95 °F, THEN T-102, Containment Control SP/T, SP/L, DW/P, DW/T, shall be entered." Step 3.9 "IF Supp Pool temperature exceeds 105 °F, THEN test shall be terminated."
DISTRACTOR (B)	**Enter T-102, "Primary Containment Control", immediately suspend testing and place 2nd loop of Suppression Pool cooling in service is wrong:** Plausible because T-102 entry is required and because 95 °F is the allowable temperature value under normal operation; also, placing the 2nd loop of SP cooling in services is a normally expected action for high SP temperatures. Incorrect because ST-6-055-230-1 allows testing to continue until Supp Pool temperature exceeds 105 °F.
DISTRACTOR (C)	**Enter T-102, "Primary Containment Control", immediately suspend testing ONLY:** Plausible because T-102 entry is required and because 95 °F is the allowable temperature value under normal operation. Incorrect because ST-6-055-230-1 allows testing to continue until Supp Pool temperature exceeds 105 °F.
DISTRACTOR (D)	**Suspend testing before Suppression Pool temperature reaches 105 °F ONLY. T-102 entry is NOT required is wrong:** Plausible because suspending testing before pool temperature reaches 105 °F is correct. Incorrect because T-102 entry is also required

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Question 5 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495367
Version ID:	3185576
User-Defined ID:	Q #05 NEW
Cross Reference Number:	CLOSED
Topic:	HPCI Hi SP Temp
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295026 EK2.07 3.8
KA Statement	SUPPRESSION POOL HIGH WATER TEMPERATURE: Knowledge of the relationship between the (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE and the following systems or component: HPCI
Cognitive level	High
Safety Function	3
10 CFR 55	41.8 / 41.10
Technical Reference with Revision No:	ST-6-055-230-1 Rev.091 T-102 Rev.028
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.02

Test Answer Key

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6 **ID: 2495963** **Points: 1.00**

The Main Steam Line **Venturi** is designed to limit maximum steam flow to _____1_____ due to a shear of any Main Steam Line (MSL). This ensures that an automatic isolation of the MSIVs will _____2_____.

	1	2
A.	140%	Prevent core uncovery
B.	140%	Limit room and area temperature for equipment reliability and personnel safety
C.	200%	Prevent core uncovery
D.	200%	Limit room and area temperature for equipment reliability and personnel safety

Answer: C

Answer Explanation

2.4.1.2.45 UFSAR Section 5.4.4, Main Steam Line Flow Restrictors {6.1.7.5}

"If a main steam line breaks outside the containment, the critical flow phenomenon would restrict the steam flow rate in the venturi throat to <200% of the rated value. Before isolation valve closure, the total coolant losses from the vessel are not sufficient to cause core uncovering, and the core is thus adequately cooled at all times."

ANSWER (C)	**200%, Prevent core uncovery is correct:** From the section of the Design basis above and UFSAR, 200% is the limit for a complete steam line break. This will prevent core uncovery from all the water flashing to steam before ECCS can reflood the core in under 30 seconds.
DISTRACTOR (A)	**140%, Prevent core uncovery is wrong**: This is a plausible response because 140% is the setpoint for the high MSL flow isolation. If the logic is made up for any steam line, all 4 steam lines will isolate. Incorrect, however, because while 140% is the isolation setpoint, 200% is the physical limit that the venturi will maintain.
DISTRACTOR (B)	**140%, Limit room and area temperature for equipment reliability and personnel safety:** This is a plausible response because 140% is the setpoint for high MSL flow. If the logic is made up for any steam line, all 4 steam lines will isolate. Incorrect, however, because while 140% is the setpoint, 200% is the physical limit that the venturi will allow. The listed criteria for isolation is plausible because this is part of the design function of NSSSS as described in L-S-26. Incorrect because this is not the limit associated with High Steam Line Flow isolation..
DISTRACTOR (D)	**200%, Limit room and area temperature for equipment reliability and personnel safety**: Plausible because 200% is correct and because the listed criterion for isolation is part of the design function of NSSSS as described in L-S-26. Incorrect because this is not the limit associated with High Steam Line Flow isolation.

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Question 6 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495963
Version ID:	3185575
User-Defined ID:	Q #06 NEW
Cross Reference Number:	CLOSED
Topic:	MS Rx Internals Design Flow
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	239001 K1.01 3.5
KA Statement	Knowledge of the physical connections and/or cause and effect relationships between the (SF3, SF4 MRSS) MAIN AND REHEAT STEAM SYSTEM and the following systems: Reactor vessel and internals
Cognitive level	Low
Safety Function	4
10 CFR 55	41.2
Technical Reference with Revision No:	L-S-42 Rev.010 L-S-26 Rev.004 UFSAR ch.15 Rev.020
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0001B.08

Test Answer Key

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7 **ID: 2495161** **Points: 1.00**

Unit 1 is performing a startup at 24% Reactor power
Feedwater Heating is not in service

- A break occurs in the FAS supply at the discharge of the EHC pump resulting in a low EHC pressure trip of the main turbine
- SE-16, "Response to EHC Leaks" is entered

When will the Reactor scram (if ever) and why/why not?

A. The Reactor will not scram because the Turbine 1st stage pressure bypass is in effect.

B. The Reactor will scram immediately due to Turbine Control Valve/Turbine Stop Valve RPS Scram

C. The reactor will scram on high pressure immediately because the location of the EHC leak results in rapid bypass valve closure

D. The reactor will scram on high pressure approx. 1-2 minutes later when the Bypass valves accumulators are exhausted

Answer: D

Answer Explanation

ANSWER (D)	**The reactor will scram on high pressure approx. 1-2 minutes later when the Bypass valves accumulators are exhausted is correct:** The applicants must assess the progression of the event and integrated plant response to an EHC leak and determine that with Rx power less than the Turbine Trip 1st stage pressure setpoint of ~190 psig or 29.5%, a turbine trip will not directly cause a RPS scram signal. Furthermore, a loss of EHC pressure will cause a turbine trip at 1100 psig pressure, but the BPVs have accumulators which will maintain the valves open and operable for at least 1 minute and probably more. This will allow the valves to accommodate the steam volume after a scram and turbine tip to prevent opening a relief valve; however, once the accumulators are exhausted, the BPVs will close and Reactor pressure will rise to the scram setpoint
DISTRACTOR (A)	**The Reactor will not scram because the Turbine 1st stage pressure bypass is in effect is incorrect:** This is plausibly true due to the fact that a scram will not occur **immediately**. But as noted above, a scram will occur eventually.
DISTRACTOR (B)	**The Reactor will scram immediately due to Turbine Control Valve/Turbine Stop Valve RPS Scram is wrong:** This would be correct if the Rx power provided in the stem was above the Turbine Trip 1st stage pressure setpoint of ~190 psig or 29.5% power. Also plausible because turbine 1st stage is not provided in the stem.
DISTRACTOR (C)	**The reactor will scram on high pressure immediately because the location of the EHC leak results in rapid bypass valve closure is wrong:** This is plausible because the reactor will immediately scram once the BPVs fail closed. However, for the location of the EHC leak provided in the stem, the bypass valve accumulators would maintain the BPVs open for at least a minute following a loss of EHC pressure.

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Question 7 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495161
Version ID:	3185577
User-Defined ID:	Q #07 NEW
Cross Reference Number:	CLOSED
Topic:	MT Trip and BPV operations
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question meets the K/A because the candidate must demonstrate knowledge of the operation of the TBPV system and the reasons why post turbine trip pressure control functions as it does to answer the question
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295005 AK3.07 3.9
KA Statement	Knowledge of the reasons for the following responses or actions as they apply to (APE 5) MAIN TURBINE GENERATOR TRIP: Turbine Bypass Valve Operation
Cognitive level	High
Safety Function	3
10 CFR 55	41.5 / 41.10
Technical Reference with Revision No:	SE-16 Rev.015
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0031.02

Test Answer Key

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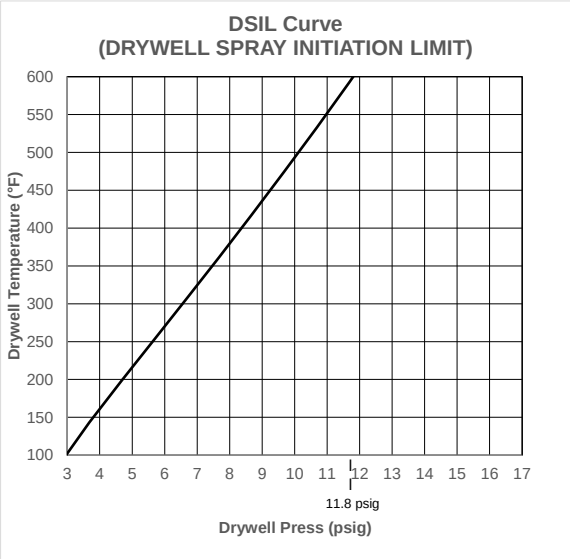
8 **ID: 2495386** **Points: 1.00**

Plant conditions are as follows:

- Drywell pressure is 8 psig
- Drywell temperature is 275 degrees

Given the following graph

Which of the following identifies whether the Drywell Spray Initiation conditions are Safe or Unsafe and what is the basis for the safe side of the graph?



	Safe / Unsafe	Basis
A.	Unsafe	Limit evaporative cooling pressure drop
B.	Unsafe	Ensure Convective cooling is capable of limiting peak pressure
C.	Safe	Limit evaporative cooling pressure drop
D.	Safe	Ensure Convective cooling is capable of limiting peak pressure

Answer: C

Answer Explanation
Examinee must determine that Drywell temperature and Pressure combination given are below the safe/unsafe line on the graph. Then the candidate must determine that below line is safe. The examinee must then recall the basis for the curve.

ANSWER (C)	**Safe, Limit evaporative cooling pressure drop is correct:** When plotted on the curve, 8 psig DW pressure and 275 °F DW temp is below the curve which is the safe side. Being on this side ensures that the rapid evaporative cooling pressure drop associated with DW spray will not cause a SP to DW d/P greater than design pressure ensuring Containment integrity
DISTRACTOR (A)	**Unsafe Limit evaporative cooling pressure drop is wrong:** The first part is plausible if the point is mis-plotted on the graph or the graph is misapplied. Incorrect because the plotted point is on the safe side of the curve. The second part is correct - limit the evaporative cooling pressure drop is the basis for the curve
DISTRACTOR (B)	**Unsafe, Ensure Convective cooling is capable of limiting peak pressure is wrong**: The first part is plausible if the point is mis-plotted on the graph or the graph is misapplied. The second part is plausible because DW spray will limit the peak DW pressure. Incorrect because the correctly plotted point is on the safe side of the curve and because limiting the evaporative cooling pressure drop is the basis for the curve
DISTRACTOR (D)	**Safe, Ensure Convective cooling is capable of limiting peak pressure is wrong:** The first part is correct. The second part is plausible because DW spray will limit the peak DW pressure. Incorrect because limiting the evaporative cooling pressure drop is the basis for the curve

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 8 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495386
Version ID:	3196158
User-Defined ID:	Q #08 NEW
Cross Reference Number:	OPEN - EMBEDDED
Topic:	DW temp pressure effects
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	Embedded DW spray initiation limit curve
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295028 EK1.05 3.8
KA Statement	HIGH DRYWELL TEMPERATURE:) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 5) HIGH DRYWELL PRESSURE
Cognitive level	H
Safety Function	5
10 CFR 55	41.5 / 41.7
Technical Reference with Revision No:	T-102 Rev.028 T-102 Basis Rev.029
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.02

9 **ID: 2496014** **Points: 1.00**

The 1A RHR Pump had been operating for 45 minutes in the full flow test mode when it was manually secured. As soon as it was secured, it was determined that the 1A RHR Pump needed to be restarted for testing.

Which of the following describes the minimum wait time before restarting the 1A RHR Pump, if any?

A. No wait time is required.

B. Must wait 15 minutes prior to restarting the pump.

C. Must wait 30 minutes prior to restarting the pump.

D. Must wait 60 minutes prior to restarting the pump.

Answer: A

Answer Explanation

- A is correct - per S51.8K

3.9 For normal operations:
Pumps may only be started once an hour at rated temperature
OR twice an hour at ambient temperature. Subsequent starts require a 30 minute run time at full speed
OR 60 minutes idle time.

The precaution above applies to all large motors > 2.3 Kv and is not system specific

ANSWER (A)	**No wait time is required is correct:** Based on the note 3.9 above, since the motor has been running for 45 minutes, it can be started and brought up to operating speed one time with no waiting time required.
DISTRACTOR (B)	**Must wait 15 minutes prior to restarting the pump is wrong**: Plausible misconception that 15 minutes of wait time coupled with a 45-minute runtime would satisfy the one hour limit at rated temperature described in note 3.9. Incorrect because no wait time is required.
DISTRACTOR (C)	**Must wait 30 minutes prior to restarting the pump is wrong:** Plausible because at ambient temperature the pump may be started twice an hour and because subsequent starts require a 30 minute wait time as described in note 3.9. . Incorrect because no wait time is required.
DISTRACTOR (D)	**Must wait 60 minutes prior to restarting the pump is wrong:** Plausible if the candidate misapplies the one start per hour standard to the time when the pump is secured or misapplies the 60 minute idle time described in note 3.9. Incorrect because no wait time is required

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 9 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	2.50
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496014
Version ID:	3185580
User-Defined ID:	Q #09 BANK
Cross Reference Number:	CLOSED
Topic:	Large Motor Starting Limits
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	The precaution above applies to all large motors > 2.3 Kv and is not system specific
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	3
Group	
KA # and Rating	G 2.1.32 3.8
KA Statement	CONDUCT OF OPERATIONS Ability to explain and apply system precautions, limitations, notes, or cautions
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.10
Technical Reference with Revision No:	S51.8.K Rev.026
Question History: (i.e. LGS NRC-05)	2017 NRC #67
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS00

10 **ID: 2507326** **Points: 1.00**

While exiting a posted Contaminated Area, you perform a whole body frisk under the following conditions:

- Background reading is 310 cpm
- Highest reading during frisk is 400 cpm

WHICH ONE of the following describes your required action, if any?

A. Move to an area of lower background; re-perform frisk

B. Change scrubs, re-perform frisk; if readings remain unchanged, contact RP

C. Re-perform frisk at current location; if readings are unchanged, contact RP

D. No required action; exit the area

Answer: A

Answer Explanation

Answer: Move to an area of lower background and re-perform frisk

Whole Body Frisking Method per NISP-RP-006

Contact Radiation Protection if personal or clothing contamination is suspected, or if there are problems with equipment or background.

- A proper whole body frisk should take a minimum of two minutes.
- Verify the equipment is within calibration, has had proper pre-operational checks, and is operating on the X1 scale.
- **The background reading should be less than 200 cpm. Preliminary surveys may be performed in an area >200 cpm prior to transit to a <200 cpm background area.**
- Hold probe approximately 1/2 inch from surface being surveyed and move probe slowly (at 2 inches per second).
- If an increase in count rate is noted, return the probe to the spot.
- If count rate increases to greater than 100 counts above background using an HP-210 probe or equivalent or greater than 500 cpm above background using a 100 cm2 probe, remain in area and notify Radiation Protection.

ANSWER (A)	**Move to an area of lower background; re-perform frisk is correct:** As described above, the max background for performing a frisk is 200 cpm. A reading in this high background area is suspect at best and should be reperformed in a lower area.
DISTRACTOR	**Change scrubs, re-perform frisk; if readings remain unchanged, contact RP is wrong:** This is plausible if there were reason to believe that your scrubs were contaminated. However, this is not the first action required. The high background negates all frisking results especially when the levels are marginally above background.
DISTRACTOR	**Re-perform frisk; if readings are unchanged, contact RP is wrong:** Plausible to the candidate who is not convinced that they could be contaminated. Similarly to the previous answer, re-performing the frisk in the high background is a flawed response which leads to an invalid frisk.
DISTRACTOR	**No required action; exit the area is wrong:** Plausible response given that the reading of 400 cpm is on ly 90 cpm greater than the background reading. Being less than 100 cpm > than background means that the result is negative. However, the high background invalidates this reading.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 10 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507326
Version ID:	3194549
User-Defined ID:	Q #10 BANK
Cross Reference Number:	CLOSED
Topic:	RP-AA-350 - Recall action in response to alarming frisker
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-ct

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	3
Group	N/A
KA # and Rating	G 2.3.5 2.9
KA Statement	RADIATION CONTROL Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms or personnel monitoring equipment
Cognitive level	High
Safety Function	N/A
10 CFR 55	41.11
Technical Reference with Revision No:	NISP-RP-006 Rev.001
Question History: (i.e. LGS NRC-05)	NRC 2013
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0026A.10

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

11 **ID: 2495420** **Points: 1.00**

Unit 1 plant conditions:

- 100% power
- Normal Level and Pressure

A simultaneous failure of the following two Narrow Range RPV level transmitters occurs:

- LT-042-1N004A
- LT-042-1N004D

107 D-4, "FWLCS Failure" is received

What is the expected result of this event, if any?

A. Lowering level causing a Reactor scram

B. Rising level causing turbine and feedpump trip

C. Rising level potentially flooding the Main Steam Lines

D. Level remains steady at 35 inches as long as RFP speed remains constant

Answer: B

Answer Explanation

ANSWER (B)	**Rising level causing turbine and feedpump trip is correct:** A DFWLCS failure has two causes: 1. A loss of Rx Level signal (2/4 simultaneously or 3/4 total) OR 2. Loss of the AF100 bus (Computer) When this happens, the FWLCS will swap all RFPs to manual control and because it thinks level is now less than 12.5", it will cause a 28% runback of the RRPs This combination of FF/SF mismatch will cause level to rise until Rx level reaches +54 inches which will then result in a turbine trip and a reactor scram..
DISTRACTOR (A)	**Lowering level causing a Reactor scram is wrong:** Plausible because this is the opposite of the expected response and because a DFWLCS failure does affect RFP operation. Incorrect because the FWLCS will swap all RFPs to manual control and initiates a recirc runback that would cause power to lower, and with the same amount of feedwater being supplied, Rx level would rise not lower
DISTRACTOR (B)	**Rising level potentially flooding the Main Steam Lines is wrong:** Plausible because a DFWLCS failure does impact RFP operation and reactor level will rise. However, with the B and C Rx narrow range level transmitters still in service, they will detect the rising level and initiate a RFP and MT level 8 trip at +54 inches. however, The logic for the trip is A or B and C or D high.
DISTRACTOR (C)	**Level remains steady at 35 inches as long as RFP speed remains constant is wrong:** Plausible because the DFWLCS does swap the RFPs to manual control, and they will continue to run at a constant speed. Incorrect because level would rise causing turbine and feedpump trips**.** .

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 11 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495420
Version ID:	3194535
User-Defined ID:	Q #11 NEW
Cross Reference Number:	CLOSED
Topic:	Stm/Feed Mismatch OT-110
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	295008 AA2.02 3.9
KA Statement	Ability to determine or interpret the following as they apply to (APE 8) HIGH REACTOR WATER LEVEL: Steam flow/feedflow mismatch
Cognitive level	High
Safety Function	2
10 CFR 55	41.10
Technical Reference with Revision No:	OT-110 Rev.035
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1540.05

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

12 **ID: 2495312** **Points: 1.00**

Unit 1 is at 100% power when the following occurs:

- Annunciator 118-H4, "Reactor Enclosure Cooling Water HTX OUT HI TEMP"
- Temperature on TI-013-105, "RECW HTX Outlet Temp" is 112 °F up slow
- ON-113, "Loss of RECW" is entered for RECW high temperature

RWCU Non-Regenerative Heat Exchanger (NRHX) outlet temperature is 124 °F

Temperature is rising at constant rate of 2 °F/min

Which of the choices correctly completes the following statement?

A RWCU isolation signal will actuate in __(1)__ minutes; reactor coolant __(2)__ will rise if the isolation fails to occur.

A. 1) 3
   2) pH

B. 1) 3
   2) Conductivity

C. 1) 8
   2) pH

D. 1) 8
   2) Conductivity

Answer: D

Answer Explanation

Per S44.0.A, RWCU Op Cond.- RWCU system will isolate at 140°F at outlet of Non-regenerative Heat
Exchanger.
From DBD 3.2.5.1: Basis – Non-Regenerative Heat Exchanger Outlet Temperature

The limit on the Non-Regen HX outlet temperature is required to protect the filtering and ion exchange medium (resin) used in the F/Ds. Excessive
temperatures can cause the resin to disintegrate and dissolve in the reactor water, compounding contamination and radiation problems. The controlling
parameter value of 140F is established by the system specification {6.1.2.1)

From ON-116 Bases:
2.3.2 DETERMINE RWCU Demin that could be passing resin by identifying demin with high effluent conductivity (suspect demin recently placed in service).

BASIS
A rise in reactor water conductivity and MSL radiation in conjunction with low reactor water pH are indications of activated demin resins as they pass through the reactor. It is possible that a RWCU demin is passing resin and causing the increase in reactor water conductivity and MSL radiation levels. Demins recently placed in service and/or demins with high effluent conductivity are likely sources.

ANSWER (D)	**1) 8, 2) Conductivity is correct:** From the information above, the isolation setpoint is 140°F NRHX outlet temp for Resin protection. Current temp of 124° rising at two degrees per minute means 140° in 8 minutes. From the ON-Basis we learn that rising conductivity is an indication of damaged resin along with lowering pH.
DISTRACTOR (A)	**3, pH is wrong:** Plausible because 130 °F is the Hi Temp Alarm setpoint for the RWCU filter inlet. 6 degrees at 2 degrees per minute = 3 minutes. pH is a plausible distractor as ON-116 makes clear that resin failure will affect both parameters only in the opposite directions. Incorrect because 140°F is the NRHX outlet temp for Resin protection and because pH will lower
°DISTRACTOR (B)	**3, Conductivity is wrong:** Plausible because 130 °F is the Hi Temp Alarm setpoint for the RWCU filter inlet. 6 degrees at 2 degrees per minute = 3 minutes. The second part answer, conductivity, is correct. The first part is incorrect because 140°F is the NRHX outlet temp for Resin protection**.**
DISTRACTOR (C)	**8, pH is wrong:** The first part is correct. pH is a plausible distractor as ON-116 makes clear that resin failure will affect both parameters only in opposite fashion.

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 12 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495312
Version ID:	3192919
User-Defined ID:	Q #12 BANK
Cross Reference Number:	CLOSED
Topic:	Loss of RECW Pumps - Predict Plant/System Response
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295018; G2.1.19 3.9
KA Statement	PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW); Ability to use available indications to evaluate system or component status
Cognitive level	High
Safety Function	8
10 CFR 55	41.10
Technical Reference with Revision No:	ON-116 Bases Rev.015 ARC-MCR-H3 Rev.000
Question History: (i.e. LGS NRC-05)	NRC 2017
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0014.05

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

13 **ID: 2495713** **Points: 1.00**

Unit 2 plant conditions:

- Reactor level dropped to -150 inches
- All Low pressure ECCS pumps started
- Both Divisions of ADS actuated automatically
- All ADS SRVs opened

Currently:

- Reactor pressure is 250 psig, lowering
- Drywell pressure is 15 psig, rising
- Reactor level has recovered to -20 inches, steady

ADS Reset Pushbuttons S3A and S3C, "D/W PRESS HIGH / RX LEVEL LOW" are depressed and released.

WHICH ONE of the following describes the response of the ADS SRVs?

A. Will close initially, but will re-open after 525 seconds

B. Will close initially, but will re-open after 105 seconds

C. Will close and remain closed

D. Will remain open

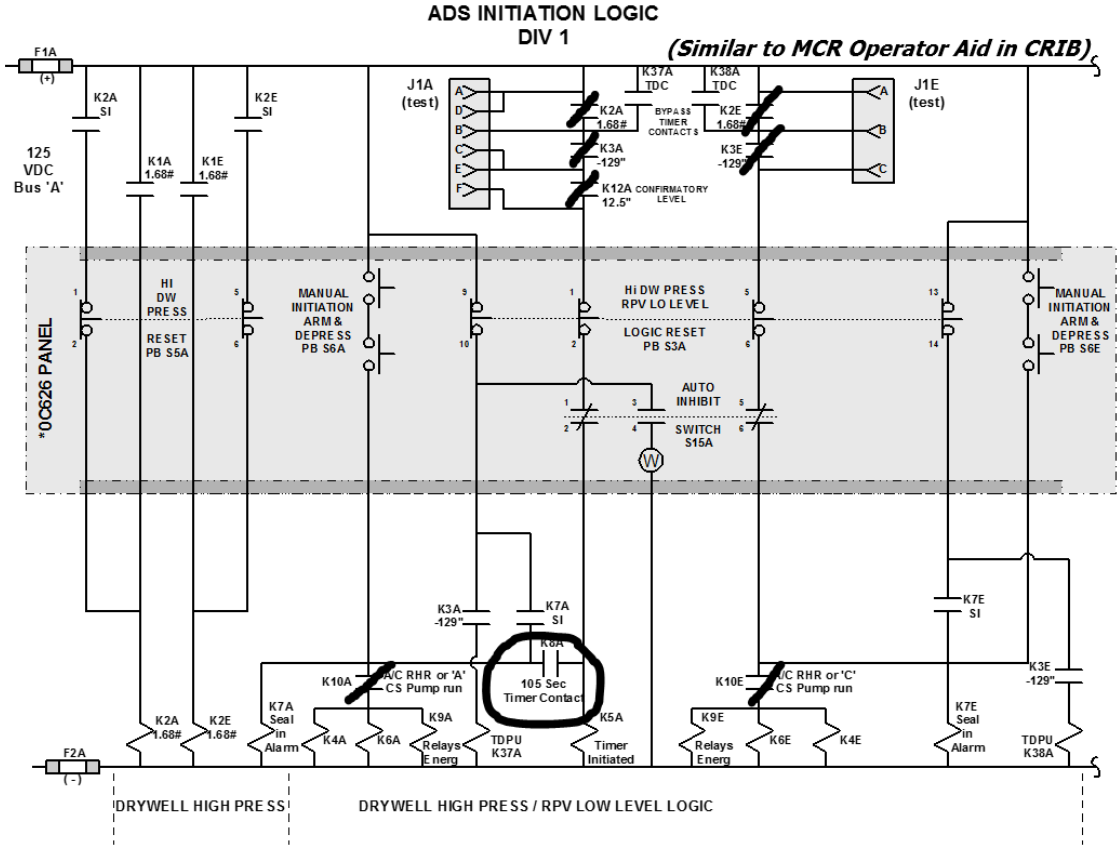
Answer: C

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

	A	E	B	D
DW (1.68)	X (or 420)	X (or 420)	X (or 420)	X (or 420)
Rx Level (-129)	X	X	X	X
Conf Level (12.5)	X		X	
T.D. (105)	X		X	
125# RHR A/C	O	O		
145# A CS	O			
145# C CS		O		
125# B/D RHR			O	O
145# B CS			O	
145# D CS				O
Energizes	K6A	K6E		



ANSWER (C)	**Will close and remain closed:** With Reactor Level restored above -129" and ADS logic reset, the ADS SRVs will close and remain closed. With the existing high drywell pressure condition (15 psig), ADS will not re-initiate unless vessel level again remains below -129 inches for 105 seconds.
DISTRACTOR (A)	**Will close initially but will re-open after 525 seconds:** With Reactor Level restored above -129" and ADS logic reset, the ADS SRVs will close and remain closed.

	Plausible because Drywell pressure remains high and level is restored but remains below the 12.5" confirmatory low level.
DISTRACTOR (B)	**Will close initially but will re-open after 105 seconds:** Plausible that valves would re-open after 105 seconds because resetting the High DW pressure relay while level was still low would result in this re-opening. But not with level >-129"
DISTRACTOR (D)	**Will remain open:** With Reactor Level restored above -129" and ADS logic reset, the ADS will close. Plausible because Drywell pressure remains high and level is restored but remains below the 12.5" confirmatory low level.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 13 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495713
Version ID:	3191481
User-Defined ID:	Q #13 BANK
Cross Reference Number:	CLOSED
Topic:	Predict ADS SRV response to ADS logic RESET
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	218000 A4.03 3.9
KA Statement	Ability to manually operate and/or monitor the (SF3 ADS) AUTOMATIC DEPRESSURIZATION SYSTEM in the control room: ADS logic reset
Cognitive level	High
Safety Function	3
10 CFR 55	41.7
Technical Reference with Revision No:	8031-M-1-B21-1030-F.003.17 8031-M-1-B21-1060-E-003, sh1 8031-M-1-B21-1060-E-004, sh1 8031-M-1-B21-1060-E-005, sh1
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0050.07B

14 **ID: 2507056** **Points: 1.00**

A Unit 2 plant shutdown is in progress with the following:

- All control rods are inserted.
- Reactor pressure is 50 psig and lowering slowly.

A coolant leak inside the Containment results in the following:

T = 0 minutes Drywell temperature is 150°F and rising.

T = 5 minutes Drywell pressure is 2.5 psig and rising.

WHICH ONE of the following describes the EOP entry requirements that must be reported to the CRS?

	T-102, Primary Containment Control,	T-101, RPV Control
A.	Must be entered at time T=0 and re-entered at time T=5	Must be entered at time T=5
B.	Must be entered at time T=0 and re-entered at time T=5	Does NOT need to be entered.
C.	Must be entered at time T=0. Does NOT need to be re-entered	Must be entered at time T=5
D.	Must be entered at time T=0. Does NOT need to be re-entered	Does NOT need to be entered.

Answer: A

Answer Explanation

ANSWER (A)	**Must be entered at time T=0 and re-entered at time T=5, Must be entered at time T=5 is correct:** When new entry conditions are received for a EOP, the RO must report those conditions to the crew and CRS. The CRS will reperform the required steps for each entry condition. Entry into T-102 is required on DW temperatures >145 °F. On DW pressure >1.68 psig, entry into both T-101 and T-102 is required. So at T=0, T-102 is required. At T=5, entry into T-101 and re-entry into T-102 is required.
DISTRACTOR (B)	**Must be entered at time T=0 and re-entered at time T=5, Does NOT need to be entered is wrong:** Plausible misconception that T-101 would not be required. The reactor was previously shutdown and other entry conditions normally associated with T-101 would be absent such as Low Rx water level, Rx pressure > 1096 psig or Power >4% following a scram. DW pressure >1.68 psig is most commonly associated with T-102. This is wrong because DW pressure >1.68 psig is a T-101 entry condition.
DISTRACTOR (C)	**Must be entered at time T=0, Does NOT need to be re-entered, Must be entered at time T=5 is wrong:** Plausible misconception that re-entry is not required as the actions to perform for rising DW pressure are complete up to the stop sign in the PC/P leg. However, as described previously, on a subsequent entry condition, the procedure must be re-entered at the beginning.
DISTRACTOR (D)	**Must be entered at time T=0. Does NOT need to be re-entered, Does NOT need to be entered is wrong:** Plausible misconception that re-entry is not required as the actions to perform for rising DW pressure are complete up to the stop sign in the PC/P leg. Not entering T-101 is plausible as described in B. These choices are wrong as described above. Entry / reentry is required.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 14 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507056
Version ID:	3194733
User-Defined ID:	Q #14 BANK
Cross Reference Number:	CLOSED
Topic:	EOP Entry and Reporting
Num Field 1:	LM
Num Field 2:	RO- Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	3
Group	N/A
KA # and Rating	G2.4.14 3.8
KA Statement	EMERGENCY PROCEDURES / PLAN Knowledge of general guidelines for emergency and abnormal operating procedures usage
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.10
Technical Reference with Revision No:	T-101 Rev.028 T-102 Rev.028 OP-LG-103-102-1002 Rev.037
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS1560.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

15 **ID: 2495354** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Day 1 of a Reactor shutdown for a refueling outage
- All recirc pumps are secured
- 1B RHR pump is in Shutdown Cooling (SDC) with a flowrate of 6000 gpm
- RPV pressure is 10 psig
- 1B RHR pump suction temperature is 165 °F
- 1B recirc suction flow is 3000 gpm

WHICH ONE of the following reflects actual plant status?

	SDC FLOW	RPV WATER TEMPERATURE
A.	Through core	165 °F
B.	Through core	240 °F
C.	Bypassing core	165 °F
D.	Bypassing core	240 °F

Answer: D

Answer Explanation
Evaluating the integrated plant response to the stem conditions, the applicants must determine that RHR is operating in the Shutdown Cooling Mode with both Recirc Pump valves F023 and F031 open creating a Shutdown Cooling Bypass leakage path that could result in an unexpected OPCON change. Specifically, the indication of B recirc suction flow indicates that SDC is bypassing the core through the Recirc pump which should be isolated based on additional information in the stem, particularly that RPV Pressure is 10 psig, indicating RPV pressurization via coolant boiling. Using the steam tables we find that 10 psig is equivalent to 24.7 psia. From the steam table for that pressure gives us 240°F

ANSWER (D)	**Bypassing core; 240 °F:** Correct, as described above.
DISTRACTOR (A)	**Through core; 165 °F:** Wrong, plausible because RHR pump suction temperature is 165° which is the procedurally directed monitoring point for coolant temperature. The candidate who does not recognize that coolant is bypassing the core would then conclude this is the correct temperature
DISTRACTOR (B)	**Through core; 240 °F:** Wrong, The first part is plausible to the candidate who identifies the high Rx pressure but does not recognize this as confirmation of bypass flow and concludes that the flowpath is correct. The second part is correct for an RPV pressure of 10 psig.
DISTRACTOR (C)	**Bypassing core; 165 °F:** Wrong, Plausible to the candidate who recognizes the bypass flow through the Recirc system but uses the procedurally directed monitoring point for temperature and does not recognize the high pressure as unusual.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 15 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495354
Version ID:	3192789
User-Defined ID:	Q #15 NEW
Cross Reference Number:	CLOSED
Topic:	Partial Loss of SDC
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	Steam Tables
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295021 AA2.04 4.6
KA Statement	LOSS OF SHUTDOWN COOLING; Ability to determine or interpret the following as they apply to (APE 21) LOSS OF SHUTDOWN COOLING: Reactor water temperature
Cognitive level	High
Safety Function	4
10 CFR 55	41.10
Technical Reference with Revision No:	ON-121 Rev.034 S51.8.B Rev.085 Steam Tables
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.01

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

16 **ID: 2495949** **Points: 1.00**

Unit 2 is operating at rated power

2A RHR pump is out of service for maintenance

A steam leak inside containment causes high Drywell pressure and a reactor scram

- RPV level is -60 inches up slow
- Drywell pressure is 15 psig rising
- Drywell temperature is 260 °F up slow

The CRS has directed Drywell Spray with 2B RHR per T-225

The HV-51-2F016B spray valve fails closed

All steps are complete

What system is available to lower containment pressure and avoid an emergency depressurization?

A. Spray the Drywell with the 2D RHR pump

B. Spray the Drywell with the "0C" RHRSW pump

C. Spray the Drywell with the "0B" RHRSW pump

D. Vent the Drywell IAW OT-101, "High Drywell Pressure" Attachment 3

Answer: B

Answer Explanation

ANSWER (B)	**Spray the Drywell with the "0C" RHRSW pump is correct:** Spraying the drywell is the most desirable course of action to effectively lower drywell press. The stem indicates that the F016B spray valve is failed closed. That only leaves the 16A flowpath for spray. Because the 2A RHR pump is not available, the OC RHRSW is a viable source which uses the same flowpath through the 16A.
DISTRACTOR (A)	**Spray the Drywell with the 2D RHR pump is wrong:** This would be correct if the HV-51-2F016B spray valve had not failed closed in the question stem. Incorrect because the valve is failed closed.
DISTRACTOR (C)	**Spray the Drywell with the "0B" RHRSW pump is wrong:** Plausible source of spray (see 0C RHRSW) but on unit 2, the A flowpath is the available RHR system injection point. On Unit 1 it is the B RHR system. 0B RHRSW cannot inject to the Rx on Unit 2.
DISTRACTOR (D)	**Vent the Drywell IAW OT-101, "High Drywell Pressure" Attachment 3 is wrong:** Plausible action to lower drywell press as this is the preferred method to control DW pressure when not in an Emergency Procedure (T-102).However, this flowpath is not available as it isolates when Drywell Pressure rises above 1.68 psig.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 16 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495949
Version ID:	3196160
User-Defined ID:	Q #16 NEW
Cross Reference Number:	CLOSED
Topic:	DW Spray Malf. Alt Path
Num Field 1:	LM
Num Field 2:	RO- High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	226001 K3.01 4.3
KA Statement	Knowledge of the effect that a loss or malfunction of the (SF5 RHR CSS) RHR/LPCI: CONTAINMENT SPRAY MODE SYSTEM MODE will have on the following systems or system parameters: Containment/drywell/suppression chamber pressure
Cognitive level	High
Safety Function	5
10 CFR 55	41.7
Technical Reference with Revision No:	T-102 Rev.028 OT-101 Rev.039
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1560.02

17 **ID: 2507161** **Points: 1.00**

Unit 1 plant conditions:

- SE-1 (Remote Shutdown) has been entered and the MCR has been evacuated due to toxic gas
- Prior to evacuating the MCR, the Reactor was scrammed and All MSIVs were closed
- No other control room actions were completed

The Remote Shutdown Panel was staffed and SE-1 activities performed

- All RSP Transfer Switches are in EMERG
- Operators are controlling level with RCIC at 35 inches
- Controlling pressure with SRVs

A primary coolant leak in the drywell causes DW pressure to rise to 1.70 psig up slow.

With no additional operator action, what is the status of RCIC and HPCI 5 minutes later?

	RCIC	HPCI
A.	Running	Running
B.	Running	Tripped
C.	Tripped	Running
D.	Tripped	Tripped

Answer: B

Answer Explanation	
ANSWER (B)	**Running, Tripped is Correct**, With operation at the RSP, all RCIC trips are bypassed except overspeed and manual. Therefore, it will run regardless of Rx water level. HPCI starts on the High DW pressure and injects at 5600 GPM. From 35 inches, water level in the vessel will reach +54 inches in approximately 1 minute. At that time, the high level trip will occur and HPCI stops injecting until level drops to -38 inches.
DISTRACTOR (A)	**Running, Running is Wrong** plausible to an applicant who recalls that operation at the RSP disables most safety interlocks. This is true for RCIC but HPCI is not controlled from the RSP. Therefore, it would Trip normally on +54 inch Rx level.
DISTRACTOR (C)	**Tripped, Running is Wrong** but plausible to the candidate who recalls that operation at the RSP disables most safety interlocks but incorrectly believes that RCIC would trip on high level as the RCIC overspeed trip is still enabled. HPCI running is plausible because there is an emergency shutdown switch on the RSP for HPCI when it has a fire induced fault. With no fault condition, RCIC would continue to inject and HPCI would trip at +54 inches.
DISTRACTOR (D)	**Tripped, Tripped is Wrong**, .Plausible to the candidate who recalls that operation at the RSP disables most safety interlocks but incorrectly believes that RCIC would trip on high level as the overspeed trip is still active. This is incorrect as the high level shutdown is bypassed.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 17 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507161
Version ID:	3196161
User-Defined ID:	Q #17 NEW
Cross Reference Number:	CLOSED
Topic:	SE-1 HPCI RCIC
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	This K/A is met at the applicant must evaluate the system response to reactor water level changes when control is established at the RSP, considering the differences in system response between operation form the MCR and RSP.
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295016 AA2.02 4.5
KA Statement	Ability to determine or interpret the following as they apply to (APE 16) CONTROL ROOM ABANDONMENT: Reactor Water Level
Cognitive level	High
Safety Function	2
10 CFR 55	41.10
Technical Reference with Revision No:	SE-1 Rev. 076
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0088.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

18 **ID: 2495937** **Points: 1.00**

WHICH ONE of the following identifies the required POST-LOCA Drywell ventilation fans and what the operation of these fans will ensure?

	FANS	Operation Ensures
A.	A,B,G,H	Prevent areas of high H2 and O2 concentrations in the DW
B.	A,B,G,H	A valid Drywell temperature indication
C.	A,B,C,D	Prevent areas of high H2 and O2 concentrations in the DW
D.	A,B,C,D	A valid Drywell temperature indication

Answer: A

Answer Explanation
T.S 3.6.6.2 lists 1AV212,1BV212,1GV212,1HV212 as the subset of drywell coolers that are the H2 mixing coolers. They discharge to the higher elevations to prevent localized accumulation of H2 and O2 from exceeding the lower flammability limits during LOCA conditions. Incorrect answers either have incorrect fans or valid temperature. Several T-102 steps requires DW temperature inputs for decision making, and/or a plausible misconception that the cooling function of the higher elevations is the bases for requiring these fans makes valid temperature a plausible second part distractor

ANSWER (A)	**A,B,G,H, Prevent areas of high H2 and O2 concentrations in the DW is correct:** As noted above, Fans A, B, G and H are the TS required DW mixing fans. The basis of TS 3.6.6.2 details the need to prevent localized areas of O2 concentration greater the 4% which would lead to potentially explosive mixtures with H2 produced post LOCA.
DISTRACTOR (B)	**A,B,G,H, A valid Drywell temperature indication is wrong:** The first part is correct. A valid temperature indication is plausible as several T-102 steps requires DW temperature inputs for decision making. Incorrect for reasons described above.
DISTRACTOR (C)	**A,B,C,D, Prevent areas of high H2 and O2 concentrations in the DW is wrong:** The second part is correct. C and D fans are plausible as the natural inclination is thatbecause the A-D were previously the normally running drywell coolers at Limerick
DISTRACTOR (D)	**A,B,C,D, A valid Drywell temperature indication is wrong:** C and D fans are plausible because the A-D were previously the normally running drywell coolers at Limerick. A valid temperature indication is plausible as several T-102 steps requires DW temperature inputs for decision making. Incorrect for reasons described above.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 18 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495937
Version ID:	3185826
User-Defined ID:	Q #18 BANK
Cross Reference Number:	CLOSED
Topic:	Limiting H2 Concentration DW Fans
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	223001 K5.12 3.8
KA Statement	Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF5 PCS) PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES: Hydrogen concentration
Cognitive level	Low
Safety Function	5
10 CFR 55	41.5
Technical Reference with Revision No:	TS 3.6.6.2 Amd 186 TSB 3.6.6 Amd 257
Question History: (i.e. LGS NRC-05)	NRC 2017
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0077.03

19 **ID: 2495689** **Points: 1.00**

Unit 1 plant startup is in progress.

SRMs are indicating:

SRM	Range
A	110
B	150
C	130
D	145

All IRMs are operable and indicating as shown below:

IRM	Range	Reading
A	1	65/125
B	1	60/125
C	2	25/125
D	2	40/125
E	2	32/125
F	1	55/125
G	2	30/125
H	1	65/125

The 'D' IRM detector fails down scale.

WHICH ONE of the following describes the plant response, if any?

A. Downscale Alarm Only

B. Rod withdraw block and downscale alarm

C. Half scram and Rod Withdraw block

D. SRM retraction is not permitted

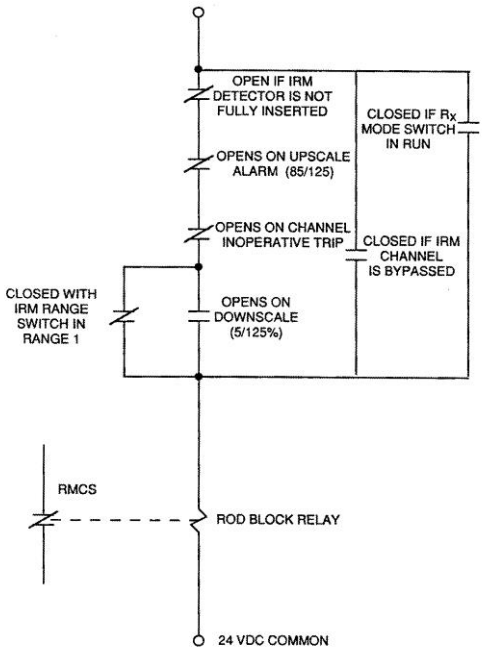
Answer: B

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

IRM Rod Blocks



Rod block only-

IRM DOWNSCALE (5/125 of scale) when above range 1
IRM DETECTOR NOT FULLY INSERTED
Control Rod Withdrawal blocks will occur on the downscale trip of any ONE IRM channel

Additionally each side (A and B) of the RPS have a bypass joystick which allows the bypass of one IRM per Side. For the A side of RPS a joystick allows for the bypass of one of the following IRMs: A,C,E, or G. For the B side of RPS a joystick allows for the bypass of one of the following IRMs: B,D,F,or H.

From the IRM DOWNSCALE G3 ARC:

IF IRM channel is above range 1 AND not bypassed AND mode switch not in RUN, THEN Rod Withdrawal Block.

ANSWER (B)	**Rod withdraw block and downscale alarm is correct:** As described above, D downscale (<5%) provides a rod block and can be bypassed by the B IRM bypass joystick on the *0C603 panel.
DISTRACTOR (A)	**Downscale Alarm Only is wrong:** This would be correct if the IRM was on range 1. Incorrect because the IRM is on range 2 .
DISTRACTOR (C)	**Half scram and Rod Withdraw block is wrong: :** Rod withdraw block is correct: An IRM downscale will provide a Rod Block. An RPS half scram is incorrect but plausible because the IRMs do provide

	inputs to RPS, an IRM INOP signal would cause a half scram, for example
DISTRACTOR (D)	**SRM retraction is not permitted is wrong:** This is a plausible answer because low SRM counts with IRM downscale cause a SRM RETRACT NOT PERMITTED alarm. However, the setpoint for low SRM counts is less than 100 cps. In this example all channels are >100 cps.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 19 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495689
Version ID:	3192873
User-Defined ID:	Q #19 NEW
Cross Reference Number:	CLOSED
Topic:	IRM rod block downscale
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	215003 A1.04 3.9
KA Statement	Ability to predict and/or monitor changes in parameters associated with operation of the (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM including: Control rod block status
Cognitive level	High
Safety Function	7
10 CFR 55	41.5
Technical Reference with Revision No:	MCR-ARC-107 G3 Rev.001
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0074.06

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

20 **ID: 2495854** **Points: 1.00**

Unit 1 is operating at 100% power when the following alarms are received:

- 118-H5, "REAC ENCL COOLING WATER HEAD TANK HI/LO LEVEL"
- 109-B1, "1 REAC ENCL COOLING WATER HI RADIATION"
- EO reports that the level in the RECW Head Tank is 71 inches up slow
- RECW Rad monitor indicates 850 cpm up slow
- SW Rad monitor indicates 63 cpm steady

WHICH ONE of the following identifies the location of leakage into or out of the RECW system?

A. RECW Heat Exchanger

B. Reactor Recirc Pump Shaft Seal Cooler

C. RWCU Regenerative Heat Exchanger

D. Fuel Pool Cooling and Cleanup Heat Exchanger

Answer: B

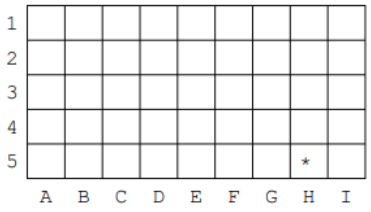
Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

From the stem, the candidate determines that the RECW Head Tank level issue is a HI level issue due to recalling that the level provided by the EO (71") is higher than normal and above the alarm setpoint (70.5").

10C855 — LIMERICK GENERATING STATION — 118 SERVICES — H-5 — 40



ALARM WORDING:

REAC ENCL
COOLING
WATER
HEAD TANK
HI/LO LEVEL

AUTOMATIC ACTIONS:

1. IF Low level, THEN Level valve LV-13-101 opens to admit demin. water to head tank.
2. IF High level, THEN none.

OPERATOR ACTIONS:

1. Verify RECW Head Tank 10T201 level locally using LG-13-101.
2. Check operation of Demin Water Supply Level Valve LV-13-101 (closes at 60.5" increasing).
3. IF LV-13-101 has failed, THEN close isolation valves 13-2029 AND maintain level with bypass valve 13-1028.
4. IF losing excessive water inventory, THEN have Operator walkdown system to check for leaks.
5. IF level is rising with isolation valves shut, THEN possibility exists of leak into system, check:
   a. RECW Rad Monitor
   b. RECW pressure AND temperature.
   c. RECW differential flow.
6. IF in conjunction with RECW High Radiation Alarm, THEN refer to S13.0.B.

In conjunction with the RECW High Radiation Alarm, the correct conclusion is that water is leaking into RECW from a higher pressure system with contaminated water.

NOTE

1. RWCU System non-regenerative heat exchangers, *B, *C **AND** 2A RWCU Recirculation Pumps and Reactor Recirculation Pumps are prime suspects for RECW High Radiation. Of all suspected radiation sources identified in this procedure, the 1A RWCU pump is the least likely suspect. [ ]

2. Control Room Operator shall observe RR-13-*R604, "RECW Radiation Monitor," Point 1 on *0C600 during component isolations **AND** Plant Operator shall perform component isolations. [ ]

ANSWER (B)	**Reactor Recirc Pump Shaft Seal Cooler is Correct:** as described above. With RECW supplied to the RR pump shaft seal coolers, the higher pressure of the Rx water will force it into the RECW in the event of a boundary leak. Reactor coolant can be pressurized up to 1000 psig+ whereas RECW is generally operating around 150 psig
DISTRACTOR (A)	**RECW Heat Exchanger is wrong:** Plausible because the RECW heat exchanger interfaces with Service water as a cooling medium, and a transfer from SW to RECW would make the head tank level rise. Incorrect because 72 inches in the head tank is above normal, and SW operating pressure is about 125 psig maximum, so RECW would leak into the SW system.
DISTRACTOR (C)	**RWCU Regenerative Heat Exchanger is wrong:** Plausible because one of RECWs cooling loads is the Non Regenerative Heat Exchanger in RWCU (NRHX) which operates at a higher pressure that RECW. Incorrect because the RGHX is not cooled by RECW.
DISTRACTOR (D)	**Fuel Pool Cooling and Cleanup Heat Exchanger is wrong:** This is a plausible answer as FPC and Cleanup Heat Exchanger can be one of RECWs cooling loads. This is done when the reactor is shutdown however as all other cooling loads are lost during this evolution. Incorrect because this scenario is at power with all RECW normal loads in service. This method of cooling also requires a spool piece installed to function and this is abnormal.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 20 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495854
Version ID:	3185595
User-Defined ID:	Q #20 NEW
Cross Reference Number:	CLOSED
Topic:	RECW Head Tank Hi Level
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	400000 K5.02 3.1
KA Statement	Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF8 CCS) COMPONENT COOLING WATER SYSTEM : Determine source(s) of RCS leakage into CCW
Cognitive level	High
Safety Function	8
10 CFR 55	41.5
Technical Reference with Revision No:	S13.7.A Rev.011 S13.6.D Rev.015 S13.0.B Rev.018
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0013.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

21 **ID: 2495593** **Points: 1.00**

Unit 2 is operating at 100% power, the following plant conditions are:

- 2B RHR is operating in Suppression Pool Cooling mode per S51.8.A, following a HPCI Pump, Valve and Flow test.

An electrical perturbation results in a loss of Division 2 DC followed shortly by a LOCA signal on Division 2 ECCS from an Excess Flow Check Valve closing.

WHICH ONE of the following describes the response of the 2B RHR pump and the HV-051-2F024B, "RHR Full flow Test Return" valve to the LOCA signal?

	RHR Pump	HV-051-2F024B
A.	Trips and Restarts 5 seconds later	Remains Open
B.	Trips and Restarts 5 seconds later	Closes
C.	Remains Running	Remains Open
D.	Remains Running	Closes

Answer: C

Answer Explanation

With 2B RHR running in Suppression pool cooling per S51.8.A, the pump is operating with 8500 GPM flow through the HV-051-2F024, Full Flow Test Return valve. This is the normal SP cooling lineup. On a LOCA, a running RHR pump will remain running to minimize the starting current heating on the pump motor. The open FF test line would normally isolate on the LOCA to ensure full flow to the Rx and prevent pump runout. In this circumstance, the loss of Div 2 DC removes LOCA initiation logic and breaker control power, therefore Pumps that are running would stay running and valves will remain in the position they were.

.

ANSWER (C)	**Remains Running, Remains Open is correct:** As described above
DISTRACTOR (A)	**Trips and Restarts 5 seconds later, Closes is wrong:** Plausible response because A and B RHR pumps would normally not start for 5 seconds following a LOCA signal to minimize the electrical perturbation on offsite power of 4 large pumps simultaneously starting. The valve would normally close as described above. However, in this scenario we know that the pump remains running and the valve open.
DISTRACTOR (B)	**Trips and Restarts 5 seconds later, Remains Open is wrong:** Plausible response because A and B RHR pumps would normally not start for 5 seconds following a LOCA signal to minimize the electrical perturbation on offsite power of 4 large pumps simultaneously starting. The second part answer option is correct
DISTRACTOR (D)	**Remains Running, Closes is wrong:** The first part answer option is correct. The second part is plausible because the valve would normally close as described above. Incorrect because in this scenario the valve is initially open and with no Div 2 DC power to the LOCA initiation logic, it remains open,

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 21 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495593
Version ID:	3192923
User-Defined ID:	Q #21 NEW
Cross Reference Number:	CLOSED
Topic:	RHR Initiation Logic
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	203000 K2.03 3.7
KA Statement	RHR/LPCI: INJECTION MODE Knowledge of electrical power supplies to the following: Initiation logic
Cognitive level	High
Safety Function	2
10 CFR 55	41.7
Technical Reference with Revision No:	E-11-1040-E-005 Rev.026
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0051.02

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

22 **ID: 2495739** **Points: 1.00**

Unit 1 is at 100% reactor power.

The RO manually scrams the reactor due to rising Drywell Pressure.

The following indications are observed:

- All Scram Status lights are extinguished
- PPC indicates "ALL RODS IN"
- SCRAM PROFILE light is lit
- Reactor Level drops to -20 inches before recovering

WHICH ONE of the following identifies the RPV level at which Setpoint Setdown is automatically activated and once established, the rate at which the setpoint returns to normal?

	Reactor Level	Rate
A.	≥+20 inches rising	3.6 inches/min.
B.	≥+20 inches rising	6.0 inches/min.
C.	≥+12.5 inches rising	3.6 inches/min.
D.	≥+12.5 inches rising	6.0 inches/min.

Answer: A

Answer Explanation	
ANSWER (A)	≥**+20 inches: 3.6 inches/ min.; Correct:** On a valid scram (A and B RPS de-energize), FWLC holds pre-scram FW flowrate for 10 seconds and then ramps to 10% flow at 6% per second. When level restores above +20 inches, FWLC transfers to single element, SCRAM PROFILE light extinguishes and Setpoint Setdown activates. Level is then restored at a rate of 3.6"/min until 35" is reached.
DISTRACTOR (B)	≥**+20 inches rising, 6.0"/min; Wrong:** The first part is correct. The second part is plausible because 6 inches per minute is a reasonable rate of level rise, and 6%/sec is the rate of feedwater runback during the scram profile. Incorrect because 3.6 inches per minute is rate of level rise until 35 inches is reached
DISTRACTOR (C)	≥**+12.5 inches rising, 3.6"/Min.; Wrong:** The first part answer option is plausible because 12.5 inches is the low level scram setpoint. Incorrect because >+20 inches rising is the RPV level at which Setpoint Setdown is automatically activated. The second part answer option is correct.
DISTRACTOR (D)	≥**+12.5 inches rising, 6%/min.; Wrong:** The first part is plausible because 12.5 inches is the low level scram setpoint. The second part is plausible because 6 inches per minute is a reasonable rate of level rise, and 6%/sec is the rate of feedwater runback during the scram profile. Incorrect because 3.6 inches per minute is rate of level rise until 35 inches is reached, and >+20 inches rising is the RPV level at which Setpoint Setdown is automatically activated.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 22 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495739
Version ID:	3192875
User-Defined ID:	Q #22 BANK
Cross Reference Number:	CLOSED
Topic:	FWLC Setpoint Post Scram
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	259002 K1.01 3.9
KA Statement	Knowledge of the physical connections and/or cause and effect relationships between the (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM and the following systems: RPS
Cognitive level	Low
Safety Function	2 - Reactor Water Inventory Control
10 CFR 55	41.2
Technical Reference with Revision No:	S06.1.D U/1 Rev.025
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LLOT0550.11B

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

23 **ID: 2507010** **Points: 1.00**

Unit 1 is scrammed following a primary coolant leak

- HPCI is injecting to restore reactor level
- Reactor level is -55 inches up slow

The downstream tap on the HPCI steam line flow element FE-55-1N032 to PDIS-55-1N657B shears off at the transmitter

WHICH ONE of the following identifies the position of the HPCI steam line isolation valves?

	HV-55-1F002	HV-55-1F003
A.	Closed	Closed
B.	Closed	Open
C.	Open	Closed
D.	Open	Open

Answer: C

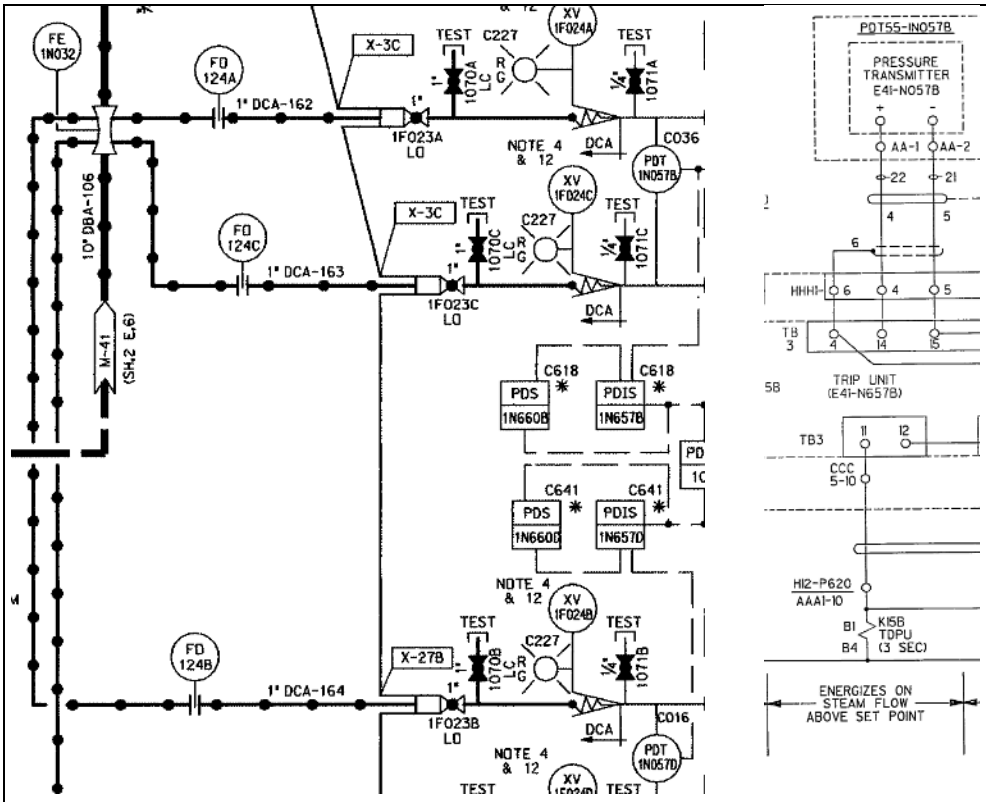
Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893



The flow element FE-1N032 is a D/P type flow detector. With no flow in the system, D/P is equal across the detector and sensed at the transmitter. As flow increases, the downstream pressure will drop due to the flow restriction. This d/p is then sensed and converted into a signal which will isolate the HPCI steam lines when the flow rate reaches 300% of normal maximum flow with a 3 sec. time delay to prevent spurious actuation.

In this scenario, the failure of the downstream sensing line would lead to low pressure in the sensing line which equates to extremely high d/p on the transmitter. The normal d/p is 0 to 974" H2O. With one side exposed to atmosphere and the high side exposed to 1000 psig steam, that is very high d/p indeed.

PDIS-55-1N657B supplies an isolation signal to the Outboard steam isolation valve HV-55-*F003.

PDIS-55-1N657D supplies an isolation signal to the Inboard steam isolation valve HV-55-*F002.

ANSWER (C)	**Open, Closed is correct:** As descibed above, only the F003 valve gets an isolation signal.
DISTRACTOR (A)	**Closed, Closed is wrong:** Plausible answer as a candidate may determine that a high flow signal would impact both the inboard and outboard valves. This is incorrect as only outboard valve logic sees the high flow rate.

DISTRACTOR (B)	**Closed, Open is wrong:** This is plausible because there are two trains of isolation logic and a candidate may not recall which train is responsible for which isolation valve. This is incorrect as the B transmitter is associated with the outboard isolation valve.
DISTRACTOR (D)	**Open, Open is wrong:** This is a plausible answer to the candidate who incorrectly believes that the downstream transmitter tap break would cause lower d/p or possibly no change in the sensed d/p. Therefore no isolation signal generated. This is wrong as previously described. isolation

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 23 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507010
Version ID:	3195217
User-Defined ID:	Q #23 NEW
Cross Reference Number:	CLOSED
Topic:	Predict HPCI Response to Steam Flow D/P Instrument Tap Rupture
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	This is a KA match because the HPCI flow venturi senses steam flow and with a sensing line break, the candidate must be able to determine the impact of that malfunction on the detector operation. HPCI is protected by PCIV/NSSSS isolations which this malfunction would impact.
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	223002 / 291002 K1.05 3.1
KA Statement	PRIMARY CONTAINMENT ISOLATION SYSTEM / NUCLEAR STEAM SUPPLY SHUTOFF / SENSORS AND DETECTORS : Operation of a flow D/P cell-type flow detector
Cognitive level	H
Safety Function	5
10 CFR 55	41.7
Technical Reference with Revision No:	M-0055 Sht 1 Rev.058 E41-1040-E-006 Rev.037 E41-1040-E-005 Rev.030
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0072.07d

24 **ID: 2504584** **Points: 1.00**

Unit 2 has experienced a complete loss of AC power

The reactor has been scrammed and all rods are inserted

T-111, "Alternate Level / Pressure Control" has been entered

No injection sources are available

- Reactor pressure is 750 psig
- Reactor level is -155 inches down slow
- Steam cooling is entered

At what level is a blowdown required?

A. -161 inches

B. -186 inches

C. -211 inches

D. -236 inches

Answer: D

Answer Explanation

ANSWER (D)	**-236 inches is correct.** -236 inches is the minimum zero injection reactor water level or MZIRWL. This is the level at which steam cooling with no injection can no longer maintain temperature in the exposed portion of the fuel below 1800°F which is the threshold for significant metal-water reaction.
DISTRACTOR (A)	**-161 inches is wrong:** Plausible as -161 inches is the top of active core (fuel zone) and lowering level further will uncover the fuel leading to rapid temperature increase. However, as noted above, with no injection, steam cooling will provide the mechanism to prevent fuel failure making this incorrect
DISTRACTOR (B)	**-186 inches is wrong:** Plausible as -186 inches is the level in T-101, where a blowdown is required to occur with injection. "RC/L-15, BE FORE RPV level reaches -186", THEN continue" immediately followed by RC/L-16 directing a T-112 blowdown. Incorrect because for the stem conditions, blowdown is not required until – 236 inches
DISTRACTOR (C)	**-211 inches is wrong:** Plausible as -211 inches is the minimum spray injection level. With core spray injection at sufficient flow, level may be maintained at this level without depressurizing. The candidate who recalls this level but not its basis could select this answer. This answer is incorrect as there is no AC power and therefore no spray injection.

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 24 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504584
Version ID:	3192877
User-Defined ID:	Q #24 NEW
Cross Reference Number:	CLOSED
Topic:	Steam Cooling
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295031EK3.04 4.3
KA Statement	REACTOR LOW WATER LEVEL: responses or actions as they apply to (EPE 8) REACTOR LOW WATER LEVEL: Steam Cooling
Cognitive level	Low
Safety Function	4
10 CFR 55	41.5 / 41.10
Technical Reference with Revision No:	T-101 Basis Rev028 T-111 Basis Rev018
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.01

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

25 **ID: 2495999** **Points: 1.00**

Both units are operating at 100% power

The Main Control Room receives a coded fire alarm for the Auxiliary Equipment Room

Who is required to be sent to respond to the alarm?

AND

What Fire Suppression System exists in the Auxiliary Equipment Room (AER)?

	Responder(s)	Suppression System
A.	Fire Brigade Leader only	Halon
B.	Fire Brigade Leader only	Cardox
C.	Entire Fire Brigade	Halon
D.	Entire Fire Brigade	Cardox

Answer: A

Answer Explanation

3.3 **PERFORM** the following for fire alarms resulting from area fire detection only:

NOTE

The announcement wording for the next step is included in Attachment 7.

3.3.1 **DISPATCH** Fire Brigade Leader. _____

WARNING

Discharge of gaseous fire suppression systems in the following areas requires full protective clothing
AND SCBA for entry:

- Auxiliary Equipment Room under floor Halon (Control Enclosure El. 283"-0")
- Remote S/D Panel Room under floor Halon (Control Enclosure El. 283"-0")
- TSC display area (1st floor) and Computer Room (2nd floor) under-floor Halon

ANSWER (A)	**Fire Brigade Leader only, Halon is correct:** Per SE-8 step 3.3 (above), upon a fire alarm resulting from fire detection only, the Fire Brigade leader is dispatched . And as the warning makes clear, in the AER under the floor is a Halon suppression agent system.
DISTRACTOR (B)	**Fire Brigade Leader only, Cardox is wrong:** Plausible response because as step 3.3 above makes clear, this is correct for a fire alarm only: the Fire Brigade Leader (FBL) only would be required to be dispatched. Cardox is plausible because CO2 is a commonly installed fire suppression agent. However, only Halon is used in the AER.
DISTRACTOR (C)	**Entire Fire Brigade, Halon is wrong:** The first part of the distractor is plausible because as step 3.2 in SE-8 directs, the entire Fire brigade should be dispatched for an alarm with some additional confirmation. As section 3.3 makes clear, the correct answer for a fire alarm only is to dispatch the Fire Brigade Leader (FBL).
DISTRACTOR (D)	**Entire Fire Brigade, Cardox is wrong:** The first part of the distractor is plausible because as step 3.2 in SE-8 directs, the entire Fire brigade should be dispatched for an alarm with some additional confirmation. In this scenario there is no confirmation so this is wrong:

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 25 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495999
Version ID:	3195068
User-Defined ID:	Q #25 NEW
Cross Reference Number:	CLOSED
Topic:	Fire Protection System Initiation
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	28600 / G2.4.26 3.1
KA Statement	FIRE PROTECTION SYSTEM: EMERGENCY PROCEDURES/PLAN Knowledge of facility protection requirements, including fire brigade and portable firefighting equipment usage
Cognitive level	Low
Safety Function	8
10 CFR 55	41.10
Technical Reference with Revision No:	SE-8 Rev.067
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0026.06

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

26 **ID: 2503044** **Points: 1.00**

Limerick Unit 2 is starting up following a refueling outage

- The unit is at 5% power at 500 psig
- Pressure and power are being raised

The primary coefficient affecting reactivity at this stage of startup is _____1_____ and its relative reactivity worth is ____2_____.

A. Void coefficient 1X10E-3 Δk/k/% voids

B. Void coefficient 1X10E-4 Δk/k/% voids

C. Moderator coefficient 1X10E-3 Δk/k/°F

D. Moderator coefficient 1X10E-4 Δk/k/°F

Answer: A

Answer Explanation

ANSWER (A)	**Void coefficient, 1X10E-3 ∆k/k/% voids is correct:** At the described power and pressure level, the reactor is above the point of adding heat and the pressure indicates that boiling is occurring and voids are formed. Therefore Void coefficient is the predominant reactivity as its average value is 1X10E-3 ∆k/k/% voids. This is approximately 10X greater than the change due to temperature/moderator which is 1X10E-4 ∆k/k/°F
DISTRACTOR (B)	**Void coefficient, 1X10E-4 ∆k/k/% voids is wrong:** The first part is correct. The second part is plausible due to the misinterpretation of the value of the exponents
DISTRACTOR (C)	**Moderator coefficient, 1X10E-3 ∆k/k/°F is wrong:** The first part would be correct if the reactor had not yet begun to pressurize forming voids in the reactor core as indicated in the stem. Incorrect because at the given pressure and power void fraction is a much larger contributor to reactivity changes. The second part is correct for the question but is incorrect for the moderator coefficient. The actual value of moderator co-efficient is 1X10E-4 Dk/k/°F, not 1X10E-3; however, 1X10E-3 could be associated with moderator coefficient due to the misinterpretation of the value of the exponents
DISTRACTOR (D)	**Moderator coefficient, 1X10E-4 ∆k/k/°F is wrong:** The first part would be correct if the reactor had not yet begun to pressurize forming voids in the reactor core. Incorrect because at the given pressure and power void fraction is a much larger contributor to reactivity changes. The second part is incorrect for the question but is correct for the moderator coefficient, making the part-2 answer option plausible

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 26 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2503044
Version ID:	3185796
User-Defined ID:	Q #26 NEW
Cross Reference Number:	CLOSED
Topic:	Void Co-efficient Definition
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	4
Group	N/A
KA # and Rating	292004 K1.10 3.2
KA Statement	REACTIVITY COEFFICIENTS: Define the void coefficient of reactivity
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.1
Technical Reference with Revision No:	NRC GF
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	N/A

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

27 **ID: 2495765** **Points: 1.00**

The 214A and 224A Load Centers are energized normally through their respective bus breakers:

- Control Power is being supplied from the 214A

An inadvertent trip of the 21 Bus Breaker occurs resulting in a loss of the 21 Bus.

- The 21 Bus has been re-energized
- The 214A Load Center has been re-energized through its bus breaker.

WHICH ONE of the following identifies the expected response of the 214A/224A Control Power Bus on:

(1) the 21 Bus Breaker trip, and
(2) the subsequent re-energization of the 214A Load Center?

A. (1) Control power must be manually transferred to the 224A Load Center
(2) When power is restored to the 214A Load Center, control power automatically transfers to the 214A Load Center

B. (1) Control power must be manually transferred to the 224A Load Center
(2) When power is restored to the 214A Load Center, control power must be manually transferred back to the 214A Load Center

C. (1) Control power automatically transfers to the 224A Load Center
(2) When power is restored to the 214A Load Center, control power automatically transfers to the 214A Load Center

D. (1) Control power automatically transfers to the 224A Load Center
(2) When power is restored to the 214A Load Center, control power must be manually transferred back to the 214A Load Center

Answer: D

Answer Explanation
In a normal configuration, the 214A Load Center supplies control power for the breakers on both the 214A and 224A Load Centers. On an undervoltage on the 'PREFERRED' Source (214A), control power will swap to the 224A Load Center which is the 'NON-PREFERRED'. Control power will not automatically swap back to 'PREFERRED' when power is restored to that source. This requires a manual action at the Load Center to select the 'PREFERRED' source.

ANSWER (D)	**(1) Control power automatically transfers to the 224A Load Center** **(2) When power is restored to the 214A Load Center, control power must be manually transferred back to the 214A Load Center is correct:** In a normal configuration, the 214A Load Center supplies control power for the breakers on both the 214A and 224A Load Centers. On an undervoltage to the 'PREFERRED' Source, control power will swap to the 224A Load Center which is the 'NON-PREFERRED'. Control power will not automatically swap back to 'PREFERRED' when power is restored to that source. This requires a manual action at the Load Center to select the 'PREFERRED' source.
DISTRACTOR (A)	**(1) Control power must be manually transferred to the 224A Load Center (2) When power is restored to the 214A Load Center, control power automatically transfers to the 214A Load Center is wrong:** Plausible misconception that a transfer to the non-preferred source would require manual operator action and an automatic transfer to the preferred source would be desired. Both parts of the answer option are also plausible because the swap is automatic in only one direction; however, the operation is reversed in the answer option
DISTRACTOR (B)	**(1) Control power must be manually transferred to the 224A Load Center (2) When power is restored to the 214A Load Center, control power must be manually transferred back to the 214A Load Center is wrong:** Plausible because tripped breakers in the plant must be manually reset prior to reclosure, and the majority of breakers must be manually reclosed.
DISTRACTOR (C)	**(1) Control power automatically transfers to the 224A Load Center** **(2) When power is restored to the 214A Load Center, control power automatically transfers to the 214A Load Center is wrong:** The first part is correct. The second part is plausible become some ABTs are normal seeking and would therefore return to the preferred source.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 27 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495765
Version ID:	3192896
User-Defined ID:	Q #27 BANK
Cross Reference Number:	CLOSED
Topic:	Preferred and Non-Preferred control power supplies
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	262001 K5.02 3.5
KA Statement	Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF6 AC) AC ELECTRICAL DISTRIBUTION: Breaker control power
Cognitive level	High
Safety Function	6
10 CFR 55	41.5
Technical Reference with Revision No:	S93.7.A Rev.045 E-10-248 Sht 1 Rev.010
Question History: (i.e. LGS NRC-05)	Bank (1242866)
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0093.04

28 **ID: 2504248** **Points: 1.00**

Unit 1 is operating at 100% power when the following occurs:

- "1A" Primary Reactor Feed Pump discharge flow transmitter (FT-006-1N002A) experiences a hardware failure (outside 4 to 20 mA)

5 minutes later:

- "1A" Secondary Reactor Feed Pump discharge flow transmitter (FT-006-106A-1) experiences a hardware failure (outside 4 to 20 mA)
- ARC-MCR-107, REACTOR, Window D-5, "FWLCS TROUBLE," alarms

1) WHICH ONE of the following is the current mode of operation of the DFWLCS?

and

2) If a Scram occurs, will Scram profile activate?

	Current Mode of Operation	Will Scram Profile Activate
A.	Three Element	No
B.	Three Element	Yes
C.	Single Element	No
D.	Single Element	Yes

Answer: C

Answer Explanation
A failure of the primary and secondary feed flow transmitters on a single RFP will cause a Total Feedwater Flow error (1TFFE), In this condition, DFWLCS does not know the amount of flow through the 1A RFP with the failure of both prjmary and secondary flow transmitters so it will swap to Single Element level control. On a scram, the system will remain in single as the scram profile function requires Feedflow input to control the feedrate. With the system in Single, DFWLC will maintain speed for a period of time and then revert to single element level control.

ANSWER (C)	**Single Element, No is correct:** As noted above, on the failure of both flow elements on the A RFP, the sytem will swap to single element and control level in that fashion. It will not execute Scram Profile due to the lack of Feed Flow input.
DISTRACTOR (A)	**Three Element, No is wrong:** This is plausible to the candidate who recalls that DFWLCS generates a 3rd flow signal called Calculated flow based on pump speed and d/p which plausibly could be used for a flow input from the 1A RFP. This is wrong as the calculated flow is only used as a check for the primary or secondary flow when either the primary or secondary is INOP but not both.
DISTRACTOR (B)	**Three Element, Yes is wrong:** This is plausible to the candidate who recalls that DFWLCS generates a 3rd flow signal called Calculated flow based on pump speed and d/p which plausibly could be used for a flow input from the 1A RFP. The candidate may determine that this signal is sufficient for Scram profile. This is wrong as the calculated flow is only used as a check for the primary or secondary flow when either the primary or secondary is INOP but not both. It is not used in Scram profile
DISTRACTOR (D)	**Single Element, Yes is wrong:** As noted above, the candidate may determine that Calculated Flow can be applied Post Scram for Scram profile. This is wrong as previously noted as it is not used for normal operation..

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 28 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	2.50
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504248
Version ID:	3194540
User-Defined ID:	Q #28 BANK
Cross Reference Number:	CLOSED
Topic:	RFP Steam Flow Loss - RFP Response
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	259002 K3.02 4.0
KA Statement	Knowledge of the effect that a loss or malfunction of the (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM will have on the following systems or system parameters: Feedwater system
Cognitive level	High
Safety Function	2
10 CFR 55	41.7
Technical Reference with Revision No:	S06.1.H Rev.016
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LLOT0560.03

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

29 **ID: 2495908** **Points: 1.00**

Unit 1 is operating at 90% power

Control rod 30-31 inadvertently scrams into the core

Which one of the following indicates the position on the 4 rod display and the reason why?

	4 Rod Display	Reason
A.	Blank - Blank	Odd Reed Switch Closed
B.	Blank - Blank	Rod Overtravel
C.	Dash - Dash	Odd Reed Switch Closed
D.	Dash - Dash	Rod Overtravel

Answer: B

Answer Explanation

ANSWER (B)	**Blank-Blank, Rod Overtravel is correct:** On a scram condition, the CRD ports high HCU pressure and Rx pressure below the mechanism to force the rod into the core. This drives the rod beyond the 00 limit switch and causes the 4 rod display to indicate Blanks. The FCD will show a full in light (green) because the 52 reed switch will make up. The rod will not indicate 00 until the scram is removed or the rod isolated and it can settle.
DISTRACTOR (A)	**Blank-Blank, Odd Reed switch closed is wrong:** The first part of the answer option is correct. The second part is plausible because an odd reed switch closed will cause a dash-dash indication and can indicates a rod drift.
DISTRACTOR (C)	**Dash-Dash, Odd Reed Switch is wrong:** The first and second parts of the answer options are plausible because an odd reed switch closed will cause a dash-dash indication and could indicate unexpected rod motion, a rod drift for example. Also plausible because an Odd Reed switch will cause a dash-dash indication when normally moving control rods.
DISTRACTOR (D)	**Dash-Dash, Overtravel is wrong:** The second part of the answer option is correct. The first part is a plausible choice given that an Odd Reed switch will cause a dash-dash indication when normally moving control rods.

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 29 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495908
Version ID:	3196162
User-Defined ID:	Q #29 NEW
Cross Reference Number:	CLOSED
Topic:	RPIS Failed Reed Switch
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	214000 K1.03 3.3
KA Statement	Knowledge of the physical connections and/or cause and effect relationships between the (SF7 RPIS) ROD POSITION INFORMATION SYSTEM and the following systems: Control rod drive mechanism
Cognitive level	Low
Safety Function	7
10 CFR 55	41.2, 41.7
Technical Reference with Revision No:	LGSOPS0073A Rev.004 L-S-037 Rev.003
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0073A..02H

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

30 **ID: 2507074** **Points: 1.00**

Unit 1 is operating at 100% with Turbine Enclosure HVAC in service per S75.1.C, "Alternate Operation of Turbine Enclosure HVAC", in a 1-1-1 alignment.

The following fans are in service:

- 1A Turbine Enclosure Supply Fan
- 1B Turbine Enclosure Exhaust Fan
- 1B TEECE Fan

A D12 bus lockout occurs

WHICH ONE of the following identifies the Turbine Enclosure Exhaust and TEECE fan status?

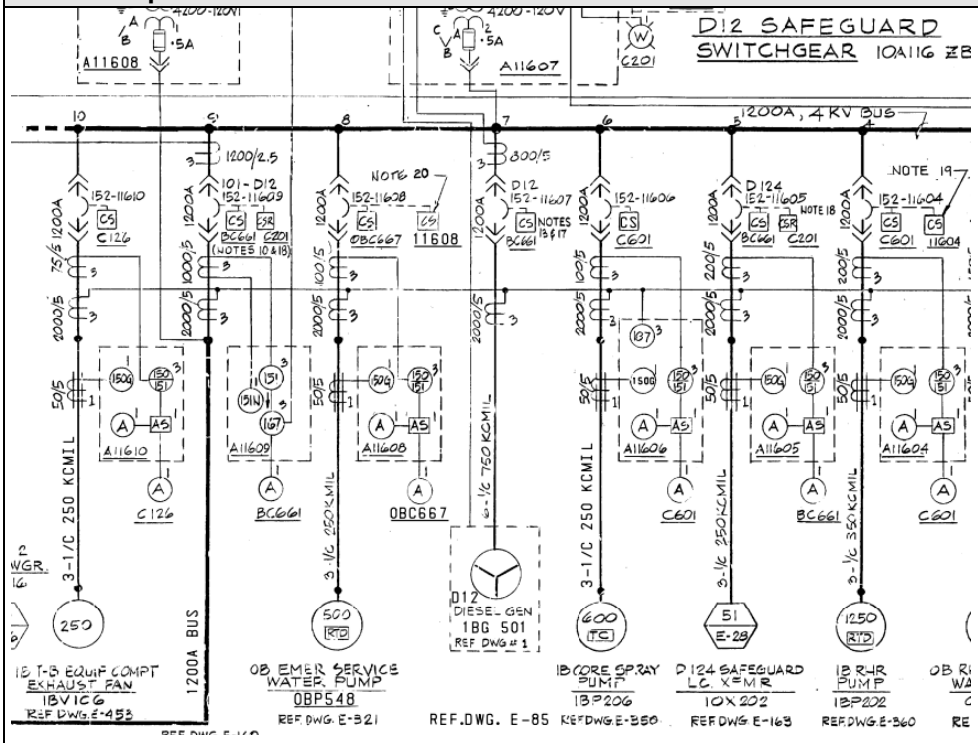
A.	1B Turbine Enclosure Exhaust Fan	Running
	1B TEECE Fan	Running
B.	1B Turbine Enclosure Exhaust Fan	Running
	1B TEECE Fan	Tripped
C.	1B Turbine Enclosure Exhaust Fan	Tripped
	1B TEECE Fan	Running
D.	1B Turbine Enclosure Exhaust Fan	Tripped
	1B TEECE Fan	Tripped

Answer: B

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation



ANSWER (B)	**1B Turbine Enclosure Exhaust Fan Running 1B TEECE Fan Tripped is correct:** 1B TEECE fan is powered from the 4KV D12 bus. The Turbine Enclosure supply and exhaust fans are powered from non-safeguard 480 VAC power. On a loss of power to D12, the 1B TEECE fan will trip and the 1A fan will auto start. The TE supply and exhaust fans will continue to operate normally
DISTRACTOR (A)	**1B Turbine Enclosure Exhaust Fan Running, 1B TEECE Fan Running is wrong:** Plausible answer to the candidate who has does not recall the power supply to the TE exhaust fan and believes that both TE exhaust and TEECE are powered from non-safeguard power. This is wrong however as the TEECE fan loses power as noted above.
DISTRACTOR (C)	**1B Turbine Enclosure Exhaust Fan Tripped, 1B TEECE Fan Running is wrong:** Plausible to the candidate who believes that 1B Exhaust fan is powered from D12. This is incorrect as noted above, 1B fan is powered from non-safeguard 480 VAC and TEECE would trip
DISTRACTOR (D)	**1B Turbine Enclosure Exhaust Fan Tripped, 1B TEECE Fan Tripped is wrong:** Plausible answer to the candidate who incorrectly recalls the power supply to the 1B TE Exhaust Fan believing that it's supply was safeguard 4 KV. This is incorrect as noted above.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 30 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	4.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507074
Version ID:	3193994
User-Defined ID:	Q #30 NEW
Cross Reference Number:	CLOSED
Topic:	Divisional Loss of power effect on TEECE
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	288000 K2.02 2.6
KA Statement	PLANT VENTILATION SYSTEMS Knowledge of electrical power supplies to the following: Auxiliary building supply and exhaust fans (turbine building/ radwaste building)
Cognitive level	Low
Safety Function	9
10 CFR 55	41.7
Technical Reference with Revision No:	E-0015 Rev.032
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0075.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

31 **ID: 2495692** **Points: 1.00**

Unit 2 was operating at 100% power when the 2A reactor recirc pump inadvertently tripped.

Plant conditions are now stabilized, with the following:

- Simulated Thermal Power is 65%
- Core Flow is 45 Mlbm/hr
- Recirc Drive Flow is 37,000 gpm

The OPRM ODA's are displaying the following information for the Period Based Detection Algorithm:

	Amplitude	Counts
OPRM 1	1.14	15
OPRM 2	1.15	17
OPRM 3	1.15	13
OPRM 4	1.16	16

WHICH ONE of the following correctly identifies the required action?

A. Contact I&C because the OPRM ODAs should not have activated

B. Reduce reactor power by inserting control rods to exit THI condition

C. Immediately scram the reactor because the plant is operating in the EXCLUSION REGION

D. Immediately scram the reactor because an OPRM UPSCALE TRIP should have occurred

Answer: D

Answer Explanation

The OPRM Upscale alarm will be received based on the above conditions for OPRMs #2 and #4 which should have resulted in a Neutron Monitoring system trip / Reactor Scram.

SETPOINT:

- OPRM channel in enabled region (≥29.5% APRM STP AND <60% recirculation drive flow)
  AND any of the following OPRM Upscale Trip setpoints reached OR exceeded:
  - Relative Signal Amplitude (1.15) AND Consecutive Confirmation Counts (16) (PBDA) (setpoint values located in Core Operating Limits Report)
  - Relative Signal Amplitude (1.50) (ABA)
  - Relative Signal Amplitude Growth Rate (1.50) (GRBA)

AUTOMATIC ACTIONS:

1. SCRAM OR 1/2 SCRAM.

CAUSES:
1. APRM Two-Out-Of-Four Voter trip (APRM HI-HI/INOP OR OPRM)

ANSWER (D)	**Immediately scram the reactor because an OPRM UPSCALE TRIP should have occurred is correct:** As described above, 2 of four OPRM channels have exceeded the Upscale Trip setpoints. These provide 2 votes to the 2 of 4 voters. A Reactor scram should be the result. That it hasn't, indicates that an ATWS has occurred and the operator should manually scram the reactor. That is an operator expectation at LGS.
DISTRACTOR (A)	**Contact I&C because the OPRM ODAs should not have activated is wrong:** Opposite of the correct response given the stem conditions of recirc drive flow <60% and power >29.5%. However both conditions are required, so this would be correct if recirc drive flow was greater than 60% or if power was lower that 29.5%. Incorrect because with only 37000 (~40%) gpm of drive flow and power of 65%, the OPRM's should be enabled
DISTRACTOR (B)	**Reduce reactor power by inserting control rods to exit THI condition is wrong:** This would be correct for a condition in which only 1 OPRM channel exceeded the setpoint. Then, it would be prudent to insert control rods because the scram setpoint had not been exceeded. However in this case, the scram setpoint has been exceeded.
DISTRACTOR (C)	**Immediately scram the reactor because the plant is operating in the EXCLUSION REGION is wrong:** Plausible because on certain P/F maps, above the restricted region is an exclusion region. Incorrect because no such EXCLUSION REGION exists on the P/F Map when the OPRMs are OPERABLE. Referring to GP-5 App. 5, only the OPRM INOP maps (Attachment 4, 5 and 6) have an exclusion region

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 31 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495692
Version ID:	3192900
User-Defined ID:	Q #31 NEW
Cross Reference Number:	CLOSED
Topic:	APRM/OPRM THI
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	215005 A2.13 4.0
KA Statement	APRM/LPRM: Ability to (a) predict the impacts of the following on the (SF7 PRMS) AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Thermal-hydraulic instability
Cognitive level	High
Safety Function	7 - Instrumentation
10 CFR 55	41.5
Technical Reference with Revision No:	ARC-MCR-208 A2 Rev. 005
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0074A.16B.01

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

32 **ID: 2495660** **Points: 1.00**

Which One of the following statements describe the Tech Spec LCO water source and the lowest Reactor Pressure above which HPCI is required to be Operable?

	Water Source	Reactor Pressure
A.	Suppression Pool	100 psig
B.	Suppression Pool	200 psig
C.	Condensate Storage Tank	100 psig
D.	Condensate Storage Tank	200 psig

Answer: B

Answer Explanation

ANSWER (B)	**Suppression Pool, 200 psig is correct:** Tech spec/3.5.1 requires HPCI to have an operable suction from the Suppression Pool (3.5.1.b.2) and the applicability statement for when HPCI is required is OPCON1, 2 and 3 when steam dome pressure is >200 psig.
DISTRACTOR (A)	**Suppression Pool, 100 psig is wrong:** The first part is correct. 100 psig is a plausible answer for operable pressure because the HPCI isolation low pressure isolation is 100 psig and in the same spec. Also, ADS must be operable above 100 psig. Incorrect because HPCI is required in OPCON1, 2 and 3 when steam dome pressure is >200 psig.
DISTRACTOR (C)	**Condensate Storage Tank, 100 psig is wrong:** Plausible answer as the CST is the normally aligned flow path. On a manual or Auto initiation, HPCI will be supplied from the CST. Only on low CST level or High SP level, will the suction swap to the SP. However, no credit is taken in accident analysis for CST water inventory. 100 psig is a plausible answer for operable pressure because the HPCI isolation low pressure isolation is 100 psig and in the same spec, and ADS must be operable above 100 psig.
DISTRACTOR (D)	**Condensate Storage Tank, 200 psig is wrong:** Plausible answer as the CST is the normally aligned flow path. On a manual or Auto initiation, HPCI will be supplied from the CST. Only on low CST level or High SP level, will the suction swap to the SP. However, no credit is taken in accident analysis for CST water inventory.The second part of the answer option is correct.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 32 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495660
Version ID:	3194472
User-Defined ID:	Q #32 NEW
Cross Reference Number:	CLOSED
Topic:	HPCI LCO Basis
Num Field 1:	LM
Num Field 2:	RO Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	206000 / G2.2.22 4.0
KA Statement	HIGH PRESSURE COOLANT INJECTION SYSTEM: EQUIPMENT CONTROL Knowledge of limiting conditions for operation and safety limits
Cognitive level	Low
Safety Function	2
10 CFR 55	41.5
Technical Reference with Revision No:	TSB 3.5.1 ECCS AMD 227
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0055.16

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

33 **ID: 2507083** **Points: 1.00**

Unit 1 is at 93% Reactor power with the following plant conditions:

- 1A and 1B Recirc Pump operating at 1125 rpm
- Total Core Flow is 81 Mlbm/hr

1B Recirc Pump has the following failed/bypassed ASD cells :

· Three (3) Phase 'C' cells
· One (1) Phase 'A' cell

Then an additional Phase C cell auto bypasses

What is the approximate total core flow 5 minutes later and the tech spec recirc loop flow mismatch (3.4.1.3) limit?

A. 77 mlbm/hr, 5%

B. 77 mlbm/hr, 10%

C. 50 mlbm/hr, 5%

D. 50 mlbm/hr, 10%

Answer: D

Answer Explanation
See S43.1.F, Attachment 1, page 12 of 106 FRR #1-12 choice 2/2...(The conditions provided in the stem are less than Min Allowed, 4 cells in a phase or 6 total) the ASD will trip. Therefore, the additional Phase 'C' cell failure will trip the '1B' ASD.

ANSWER (D)	**50 mlbm/hr, 10% is correct:** Per explanation above, ASD trips when either all cells in any one phase (4) are bypassed or total number of cells bypassed exceeds 6. On the trip, flow will drop from 81 mlbm/hr to approx. 50 mlbm/hr flow. Per Tech spec 3.4.1.3, Recirc loop flow mismatch shall be maintained within 5% when core flow is $\geq$70% and 10% when core flow is <70%. Core flow is 50% therefore the limit is 10% mismatch.
DISTRACTOR (A)	**77 mlbm/hr, 5% is wrong:** Pausible to the candidate who determines that the ASD would not trip but recalls that when a cell bypasses, total flow would drop by the amount of 3-5 mlbm/hr. 5% is plausible given a core flow of 77 mlbm/hr. 77 mlbm/hr is wrong as described above because the ASD would trip with the C cell bypass.5% is wrong as the correct answer of 50 mlbm/hr total core flow would dictate 10% mismatch limit
DISTRACTOR (B)	**77 mlbm/hr, 10% is wrong:** Pausible to the candidate who determines that the ASD would not trip but recalls that when a cell bypasses, total flow would drop by the amount of 3-5 mlbm/hr 77 mlbm/hr is wrong as described above because the ASD would trip with the C cell bypass.
DISTRACTOR (D)	**50 mlbm/hr, 5% is wrong:** 5% is plausible to the candidate who incorrectly applied TS 3.4.1.3 and determined that a 5% mismatch was applicable. This is incorrect because <70 mlbm/hr core flow, the mismatch limit is 10%

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 33 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507083
Version ID:	3194542
User-Defined ID:	Q #33 NEW
Cross Reference Number:	CLOSED
Topic:	ASD Response to Cell Bypass
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295001 AA1.01 4.0
KA Statement	Ability to operate or monitor the following as they apply to (APE 1) PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Recirculation system
Cognitive level	High
Safety Function	2
10 CFR 55	41.5
Technical Reference with Revision No:	OT-112 Rev.065 Tech Spec 3.4.1.3 Amd.186 S43.1.F Rev.013
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1540.04

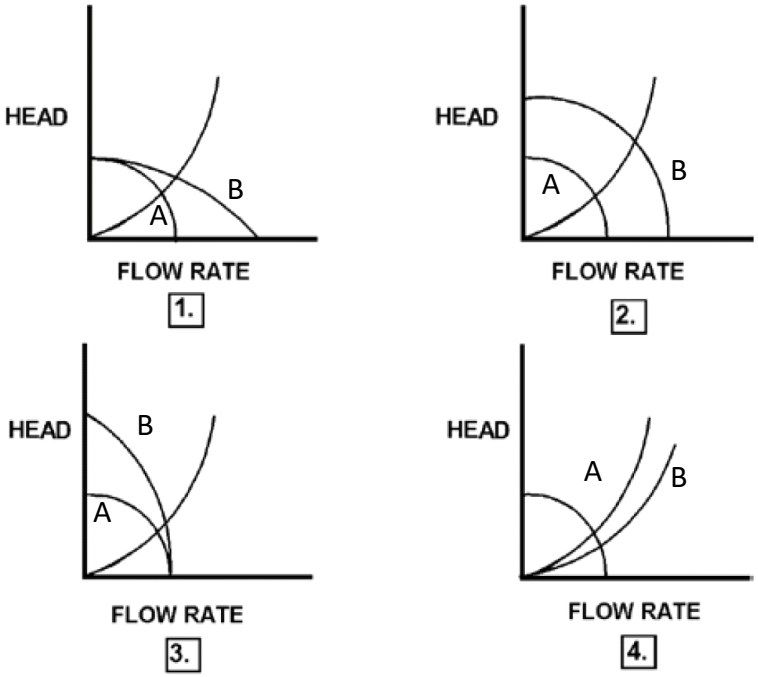
34 **ID: 2496054** **Points: 1.00**

Unit 1 is starting up following an outage

- 1B Service water pump is running by itself on Unit 1
- 1C Service water pump is about to be started.

Refer to the drawing of four sets of centrifugal pump and system operating curves (see figure below). Each set of curves shows the results of a change in pump and/or system operating conditions

Which set of operating curves shown below depicts the steady-state before (A) and after (B) conditions of the system as described above?



A. 1

B. 2

C. 3

D. 4

Answer: A

Answer Explanation

ANSWER (A)	**1 is correct:** When centrifugal pumps are running in parallel, the total head of the pump outputs does not change. However, when a 2nd pump is started, the flow rate will rise until it intersects the system operation curve further to the right and at a slightly higher head pressure.
DISTRACTOR (B)	**2 is wrong:** Curve 2 is plausible because flow is increased as expected; However, incorrect because it is the operating curve of a pump in slow speed and fast speed.
DISTRACTOR (C)	**3 is wrong:** Curve 3 is plausible because it shows 2 pumps running with higher pressure and slightly higher flow; however, it is the operating curve of a pump in slow speed with a second pump in series running in slow speed, making the distractor incorrect.
DISTRACTOR (D)	**4 is wrong:** Curve 4 is plausible because it shows a change in the system characteristic curve resulting in an increase in core flow. Incorrect because it is a representation of a single pump running at a constant speed with a change in system conditions such as throttling a valve open.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 34 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496054
Version ID:	3192918
User-Defined ID:	Q #34 NEW
Cross Reference Number:	OPEN EMBEDDED
Topic:	Pump Curves Service Water
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	Embedded graph
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	4
Group	N/A
KA # and Rating	293006 K1.14 2.7
KA Statement	FLUID STATICS AND DYNAMICS (PUMPS AND PUMP CHARACTERISTICS) Explain the results of putting centrifugal pumps in parallel or series combinations
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.14
Technical Reference with Revision No:	NRC GF
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	Modified from NRC GF QID 2279
Revision History:	
Training Objective	N/A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

35 **ID: 2496056** **Points: 1.00**

Limerick Unit 2 is operating at full power, 100 full power hours following startup from a refueling.

The power range nuclear instruments have been adjusted to 100% based on a calculated heat balance.

Which one of the following will result in indicated reactor power being **lower** than actual reactor power?

A. The feedwater temperature used in the heat balance calculation was 20°F higher than actual feedwater temperature.

B. The reactor recirculation pump heat input term used in the heat balance was 10% lower than actual.

C. The feedwater flow rate used in the heat balance calculation was 10% higher than actual flow rate.

D. The operator miscalculated the enthalpy of the steam exiting the reactor vessel to be 10 Btu/lbm higher than actual.

Answer: A

Answer Explanation

BWR

$$\left(\dot{Q}_{Stm}^{\uparrow} + \dot{Q}_{CU} + \dot{Q}_{Amb}^{\uparrow} - \dot{Q}_{FW} - \dot{Q}_{CRD} - \dot{Q}_{Pump}\right) = CTP_{IND}^{\uparrow}$$

ANSWER	**The feedwater temperature used in the heat balance calculation was 20°F higher than actual feedwater temperature is correct:** -Using a higher feedwater temperature would result in using a correspondingly high specific enthalpy value. Resulting in a higher feedwater heat transfer value. $\dot{m}_{FW}^{\leftrightarrow} h_{FW}^{\uparrow} = \dot{Q}_{FW}^{\uparrow}$ Because the feedwater heat transfer rate value is removed from the indicated power value, an increase in the feedwater heat transfer rate results in an indicated power lower than actual power
DISTRACTOR	**The reactor recirculation pump heat input term used in the heat balance was 10% lower than actual is wrong:** Plausible because it is part of the Heat Balance equation and would be correct if the pump term were positive. However, if the value for the reactor recirculation pump heat input term was 10% lower than actual, the indicated power would be greater than the actual power as shown by the heat balance equation.
DISTRACTOR	**The feedwater flow rate used in the heat balance calculation was 10% higher than actual flow rate is wrong:** Plausible because it is part of the Heat Balance equation. First by using a higher feedwater flow rate the feedwater heat transfer rate value will increase. $\dot{m}_{FW}^{\uparrow} h_{FW}^{\leftrightarrow} = \dot{Q}_{FW}^{\uparrow}$ Second, feedwater flow rate also effects the steam heat transfer rate. Using a higher feedwater flow rate, the steam heat transfer rate value will increase . The effect on feedwater, a negative term in the equation, is greater, making this choice incorrect. $\left(\dot{m}_{FW}^{\uparrow} + \dot{m}_{CRD}^{\leftrightarrow}\right) h_{Stm}^{\leftrightarrow} = \dot{Q}_{Stm}^{\uparrow}$
DISTRACTOR	**The operator miscalculated the enthalpy of the steam exiting the reactor vessel to be 10 Btu/lbm higher than actual is wrong:** Plausible because it is part of the Heat Balance equation. Using a higher specific enthalpy value results in a higher steam heat transfer. Because the steam heat transfer rate value is added to the indicated power value, an increase in the steam heat transfer rate results in an indicated power higher than actual power, making this choice incorrect.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 35 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	2
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496056
Version ID:	3185622
User-Defined ID:	Q #35 BANK
Cross Reference Number:	CLOSED
Topic:	GF Heat Balance
Num Field 1:	0.00
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	4
Group	N/A
KA # and Rating	293007 K1.13 2.9
KA Statement	HEAT TRANSFER (CORE THERMAL POWER) Calculate core thermal power using a simplified heat balance
Cognitive level	High
Safety Function	N/A
10 CFR 55	41.14
Technical Reference with Revision No:	NRC GF
Question History: (i.e. LGS NRC-05)	Bank 2284
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	N/A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

36 **ID: 2496021** **Points: 1.00**

Which ONE of the following activities must be performed by a Licensed Operator due to its effect on reactivity?

A. Adjustments to the level in the 5A feedwater heater while at 90% power

B. Locally scramming control rods in support of surveillance testing

C. Operating the refuel bridge to insert fuel into the reactor during a refueling outage

D. Locally scramming control rods as directed from T-101, RPV Control

Answer: B

Answer Explanation

OP-AA-103-102, Rev 20, step 4.1.9 states:

4.1.9. Field activities indirectly affecting reactivity (steam generator blowdown flow changes, feed water heater level changes, primary system chemical additions, etc.) may be performed by non-licensed operators under the **COGNIZANCE** of the Unit Reactor Operator.

1. At BWR's, this does not include local control rod scramming or local reactor recirculation flow changes, except as directed by emergency operating procedures.

OU-AB-4001, Rev 18, BWR FUEL AND CORE COMPONENT HANDLING PRACTICES

3.2.3. **Shall** be a SRO for core alterations. May be a non-licensed Fuel Handling Supervisor at a minimum for moves in the spent fuel pool and non-core alterations activities in the reactor vessel.

Step 3.4 list the criteria for bridge operator and no license requirements are noted.

ANSWER (B)	**Locally scramming control rods in support of surveillance testing is correct:** From OP-AA-103-102, Rev 20, step 4.1.9 listed above, this is one activity that only a licensed operator can perform. EOs may not perform this activity.
DISTRACTOR (A)	**Adjustments to the level in the 5A feedwater heater while at 90% power is wrong:** Plausible answer as this activity will impact reactivity. However, as noted above in OP-AA-102-102, Feedwater heater adjustments are exempt from license requirements
DISTRACTOR (C)	**Operating the refuel bridge to insert fuel into the reactor during a refueling outage is wrong:** Plausible answer as SRO license is required to be a Supervisor on the bridge/Fuel floor. But to operate the bridge, no license is required.
DISTRACTOR (D)	**Locally scramming control rods as directed from T-101, RPV Control is wrong:** Plausible answer as noted that only Licensed operators can locally scram rods during testing,. But Leeway is given for EOs to perform this task in an emergency.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 36 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496021
Version ID:	3194162
User-Defined ID:	Q #36 BANK
Cross Reference Number:	CLOSED
Topic:	Licensed Operator Reactivity Adjustments
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-ct

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	3
Group	N/A
KA # and Rating	G 2.1.37 4.3
KA Statement	CONDUCT OF OPERATIONS Knowledge of procedures, guidelines, or limitations associated with reactivity management
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.10
Technical Reference with Revision No:	OP-AA-101-111 Rev.013 OP-AA-103-102 Rev.021 OU-AB-4001 Rev.018
Question History: (i.e. LGS NRC-05)	1267870
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS2010.01D

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

37 **ID: 2495464** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor power is 100%

The following annunciator alarms:

- 109 RAD F-1, 1 MAIN STEAM LINE RAD MON A/B HI / DOWNSCALE
- 109 RAD F-2, 1 MAIN STEAM LINE RAD MON C/D HI / DOWNSCALE

Main Steam Line radiation levels are approximately 1750 mr/hr up slow

Consider: ON-102, "Air Ejector Discharge or Main Steam Line High Radiation"
T-103, "Secondary Containment Control"

WHICH of the following procedure(s) is(are) required to be entered due to the current alarms

AND

What is the basis for lowering Reactor power?

	Procedure	Basis
A.	ON-102 ONLY	Operation below HIGH-HIGH alarm point of the MSL rad monitors should result in acceptable release rates
B.	ON-102 ONLY	Maintain Turbine Enclosure habitability to support operations
C.	ON-102, T-103	Operation below HIGH-HIGH alarm point of the MSL rad monitors should result in acceptable release rates
D.	ON-102, T-103	Maintain Turbine Enclosure habitability to support operations

Answer: C

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

1.0 SYMPTOMS

1.1 *AIR EJECTOR OFFGAS DISCHARGE HI RADIATION alarm (*09-G-2).

1.2 Rise in Main Steam Line radiation to 1.5 x normal full power background.

2.1 **IF** Main Steam Line Hi Radiation,
THEN ENTER T-103
AND PERFORM concurrently with this procedure.

2.3 **IF** power reduction is required to maintain air ejector discharge radiation level below Hi Hi Alarm setpoint (ARC-MCR-*09 G1)
OR main steam line radiation level below 3 x normal full power background,
THEN REDUCE reactor power in accordance with GP-5 Appendix 2, Section 3.1, Reducing Rx Power,
AND Reactor Maneuvering Shutdown Instructions to maintain air ejector discharge radiation level below Hi Hi Alarm setpoint (ARC-MCR-*09 G1)
AND Main Steam Line radiation level below 3 x normal full power background. (**CM-1**)

4.3 This radiation level will result in acceptable short term off-gas releases after a delay in the charcoal absorbers. The Hi Hi Alarm setpoint of ARC-MCR-*09 G1 corresponds to an Unusual Event in LGS Emergency Plan Annex, Table 3-1. ARC-MCR-*07 gives the current value for 3x normal full power background which is the setpoint for the Main Steam LINE HIGH-HIGH RADIATION alarm (*07 I-1). Operation below HIGH-HIGH alarm point of the MSL rad monitors should result in acceptable release rates. Also reducing power below the HIGH-HIGH MSL rad alarm setpoint will allow the operator to be alerted by the alarm if the radiation levels should rise again. **(CM-1)**

ANSWER (C)	**ON-102, T-103, Operation below HIGH-HIGH alarm point of the MSL rad monitors should result in acceptable release rates is correct:** ON-102 step 2.1 states: **IF** Main Steam Line Hi Radiation, **THEN ENTER** T-103 **AND PERFORM** concurrently with this procedure Discussion step 4.3 states: Operation below HIGH-HIGH alarm point of the MSL rad monitors should result in acceptable release rates.
DISTRACTOR (A)	**ON-102 ONLY, Operation below HIGH-HIGH alarm point of the MSL rad monitors should result in acceptable release rates is wrong:** The first part of the answer option is plausible as the MSL rad monitor is a ON-102 entry condition. T-103 should also be entered.
DISTRACTOR (B)	**ON-102 Only, Maintain Turbine Enclosure habitability to support operations is wrong:** The first part of the answer option is plausible as the MSL rad monitor is a ON-102 entry condition. T-103 should also be entered.

	Turbine enclosure habitability is plausible as rising MSL rad levels require surveys as noted below from step 2.4: 2.4 **MONITOR** the following radiation levels: Main Steam Line SJAE Discharge Offgas Post Treatment North Stack Effluent This is not the reason however
DISTRACTOR (D)	**ON-102, T-103, Maintain Turbine Enclosure habitability to support operations is wrong:** . Turbine enclosure habitability is plausible as rising MSL rad levels require surveys as noted below from step 2.4: 2.4 **MONITOR** the following radiation levels: Main Steam Line SJAE Discharge Offgas Post Treatment North Stack Effluent This is not the reason however

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 37 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495464
Version ID:	3194550
User-Defined ID:	Q #37 NEW
Cross Reference Number:	CLOSED
Topic:	ON-102 Power Reduction
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	2
KA # and Rating	295017 AK3.04 3.7
KA Statement	Knowledge of the reasons for the following responses or actions as they apply to (APE 17) ABNORMAL OFFSITE RELEASE RATE: Power reduction
Cognitive level	Low
Safety Function	9
10 CFR 55	41.5
Technical Reference with Revision No:	ON-102 Rev.033 T-103 Rev.025
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

38 **ID: 2496046** **Points: 1.00**

Limerick Unit 1 is performing a startup following a refueling outage

As the reactor approaches criticality, SRM count rates rise

All SRMs are approximately 4.5 X 10^3 cps.

The neutrons most responsible for reactor control are _____1_____ and are more likely to _____2_____.

	1	2
A.	Prompt	cause fission of a Pu-240 nucleus
B.	Prompt	become a thermal neutron
C.	Delayed	cause fission of a Pu-240 nucleus
D.	Delayed	become a thermal neutron

Answer: D

Answer Explanation

ANSWER (D)	**Delayed, become a thermal neutron is correct:** Following a fission event, prompt neutrons are born almost immediately and by definition less than $1X10^{-14}$ sec. But the number of delayed neutrons which are born after that time, determines the ability to control the reactor as their slower generation causes reactor power to change more gradually. Delayed neutrons are born at a lower energy in general and therefore require fewer collisions to thermalize and therefore are less likely to leak out of the core.
DISTRACTOR (A)	**Prompt, cause fission of a Pu-240 nucleus is wrong:** Plausible answer as prompt neutrons are more plentiful and occur first, but at a higher energy level, the prompt neutron is therefore more likely to cause fast fission. However, the this does not lend itself to Reactor control as fast fission makes the reactor less controllable. Fission of Pu-240 is plausible as Pu-240 requires neutron energies of at least 1.0 MeV and prompt neutrons are born at a higher energy than delayed neutrons.
DISTRACTOR (B)	**Prompt, become a thermal neutron is wrong:** Plausible answer as prompt neutrons are more plentiful and occur first. However, the rapidity of their generation would make the reactor less controllable. Also, due to the factors listed above, the population of prompt neutrons is more likely to be reduced relative to the population of delayed neutrons during the thermalization process with many additional collisions required. This means that the delayed neutron is more likely to be absorbed/captured/leak from the core before thermalization.
DISTRACTOR (C)	**Delayed, cause fission of a Pu-240 nucleus is wrong:** As noted above, delayed neutrons is correct. Fission of Pu-240 is plausible as Delayed neutrons cause U-235 fission. However, Pu-240 requires neutron energies of at least 1.0 MeV and delayed neutrons are born with an energy of approximately 0.5 MeV. Therefore, they are unlikely to cause Pu-240 fission..

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 38 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496046
Version ID:	3185624
User-Defined ID:	Q #38 NEW
Cross Reference Number:	CLOSED
Topic:	Prompt vs Delayed Neutrons
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	4
Group	N/A
KA # and Rating	292001 K1.02 3.1
KA Statement	Define prompt and delayed neutrons
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.1
Technical Reference with Revision No:	NRC GF
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	N/A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

39 **ID: 2496024** **Points: 1.00**

Unit 1 is operating at 100% power

- RCIC failed a surveillance test resulting in RCIC being declared INOPERABLE and UNAVAILABLE
- RCIC return to operable is expected in 96 hours

WHICH ONE of the following correctly identifies (1) the location of required protected equipment postings for the HPCI system and (2) if access near the HPCI system while it is protected is permitted for an Operator performing rounds, inspections, and alarm response?

	Location of HPCI protection postings	Access for Operator permitted
A.	In the field ONLY	No
B.	In the field ONLY	Yes
C.	Main Control Room and in the field	No
D.	Main Control Room and in the field	Yes

Answer: D

Answer Explanation

From OP-AA-108-117

4.3.8. The following considerations and examples are to be evaluated when posting protected equipment:

– For extent of protection, barriers must extend back at least one component protected equipment. For example:

• Concerning protected pumps and fans, the local and remote control swi the pump/fan general area, the power supply (i.e. back to the pump / fa feeder breaker), specific instruments (or instrument racks as appropriat could cause a pump/fan trip or are required for monitoring, and necessa support systems (e.g. cooling water).

4.4. Access or Work on or Near Protected Equipment **(CM-1)**

4.4.1. Generally, access or work on or near protected equipment will not be allo Exceptions to this rule are as follows:

– Operator performing rounds, inspections, and alarm response.

ANSWER (D)	**Main Control Room and in the field, Yes is correct:** For the reasons listed in the procedure sections above.
DISTRACTOR (A)	**In the field ONLY, No is wrong:** In the field only is correct but incomplete. OP-AA-108-117 makes clear that both local and remote locations must be posted. Plausible that protected equipment must be avoided under all circumstances to maximize reliability. Step 4.4.1 provides the exception for operators performing rounds etc.
DISTRACTOR (B)	**In the field ONLY, Yes is wrong:** In the field only is correct but incomplete. OP-AA-108-117 makes clear that both local and remote locations must be posted. The second part of the answer option is correct.
DISTRACTOR (C)	**Main Control Room and in the field, No is wrong:** The first part of the answer option is correct. Plausible misconception that protected equipment must be avoided under all circumstances to maximize reliability. Step 4.4.1 provides the exception for operators performing rounds etc.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 39 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496024
Version ID:	3194166
User-Defined ID:	Q #39 BANK
Cross Reference Number:	CLOSED
Topic:	Recall Protected Equipment process requirements
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	3
Group	N/A
KA # and Rating	G 2.2.14 3.9
KA Statement	EQUIPMENT CONTROL Knowledge of the process for controlling equipment configuration or status
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.10
Technical Reference with Revision No:	OP-AA-108-117 Rev.007
Question History: (i.e. LGS NRC-05)	NRC 2017 Dec #69
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS2010.10

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

40 **ID: 2495352** **Points: 1.00**

Unit 1 plant conditions are as follows:

· OPCON 5 with fuel handling in-progress per FH-105, Core Component Movement – Core Transfer

· The SRO on the refueling platform reports that a fuel bundle is being lowered into the core

While the bundle is being lowered, the RO reports that SRM "1B" count rate has risen from 230 cps to 475 cps.

WHICH ONE of the following describes the ability to continue lowering the bundle, and whether entry into ON-120, "Fuel Handling Problems" is required?

	Ability to Continue Lowering the Bundle into the Core	Entry into ON-120, "Fuel Handling Problems
A.	Bundle may NOT be lowered until count rate stabilizes	NOT Required
B.	Bundle may NOT be lowered until count rate stabilizes	Required
C.	Continued lowering of the bundle IS permitted	NOT Required
D.	Continued lowering of the bundle IS permitted	Required

Answer: A

Answer Explanation

- Since SRM count rate doubled once, per FH-105 step 3.7.4 lowering of the bundle must stop until count rate stabilizes at a value of less than 2 doublings, and no spiking or indication of SRM inoperability exists, then lowering the bundle may be continued. ON-120 entry is only required if SRM count rate doubles twice (i.e. one doubling would be from 230 to 460, a second doubling would be from 460 to 920)

ANSWER (A)	**Bundle may NOT be lowered until count rate stabilizes, NOT Required is correct:** Since SRM count rate doubled once, per FH-105 step 3.7.4 lowering of the bundle must stop until count rate stabilizes at a value of less than 2 doublings, and no spiking or indication of SRM inoperability exists, then lowering the bundle may be continued.
DISTRACTOR (B)	**Bundle may NOT be lowered until count rate stabilizes, Required is wrong:** The first part of the answer option is correct. The second part is plausible because count rate has more than doubled; however, ON-120 entry is only required if SRM count rate doubles twice (i.e. one doubling would be from 230 to 460, a second doubling would be from 460 to 920).
DISTRACTOR (C)	**Continued lowering of the bundle IS permitted, NOT Required is wrong:** The first part of the answer option is plausible because FH-105 requirements allow the lowering to continue but only after counts have stabilized. The second part is correct
DISTRACTOR (D)	**Continued lowering of the bundle IS permitted, Required is wrong:** The first part of the answer option is plausible because FH-105 requirements allow the lowering to continue but only after counts have stabilized. The second part is plausible because count rate has more than doubled; however, ON-120 entry is only required if SRM count rate doubles twice (i.e. one doubling would be from 230 to 460, a second doubling would be from 460 to 920)..

FH-105, ON-120

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 40 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	2.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495352
Version ID:	3185626
User-Defined ID:	Q #40 BANK
Cross Reference Number:	CLOSED
Topic:	OPCON 5 with fuel handling in-progress per FH-105, Core Componen
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295023 / G2.4.17 3.9
KA Statement	REFUELING ACCIDENTS; EMERGENCY PROCEDURES / PLAN Knowledge of emergency and abnormal operating procedures terms and definitions
Cognitive level	High
Safety Function	8
10 CFR 55	41.10
Technical Reference with Revision No:	FH-105 Rev.054 ON-120 Rev.031
Question History: (i.e. LGS NRC-05)	2016 NRC
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS1550.01

41 **ID: 2507315** **Points: 1.00**

LGS Unit 1 is operating at 75% power

- A loss of feedwater heating causes feedwater temperature to suddenly decreases by 10°F

Critical power will initially _____; and bundle power will initially _____.

A. increase; increase

B. increase; decrease

C. decrease; increase

D. decrease; decrease

Answer: A

Answer Explanation	
ANSWER	**increase; increase is correct:** On a loss of feedwater heating, feedwater inlet temperature will drop. This cold water addition will cause the more subcooling and lower enthalpy which causes critical power and the bundle power to rise.
DISTRACTOR	**increase; decrease is wrong:** Plausible that bundle power would drop as the cooler water causes a drop in steam generation due to increased subcooling. The novice applicant may equate steam generation to bundle power. This is wrong as denser water causes increased thermalizations.
DISTRACTOR	**decrease; increase is wrong:** Plausible that critical power drops to the applicant who equates critical power to actual power. This is incorrect as crtical power is the power necessary to achieve OTB
DISTRACTOR	**decrease; decrease is wrong:** Plausible to the candidate who equates critical power to actual power and determines that it decreases and who equates steam generatation to bundle power as the cold water initially suppresses steam generation. Actual bundle power and critical power both rise.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 41 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	2
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507315
Version ID:	3193969
User-Defined ID:	Q #41 BANK
Cross Reference Number:	CLOSED
Topic:	B1298,Thermal Limits
Num Field 1:	LM
Num Field 2:	RO
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	4
Group	
KA # and Rating	293009 K1.43 3.4
KA Statement	Core Thermal Limits: For the following plant operating or accident condtions, identify which of the three core thermal limits are most limiting: Cold Water Addition
Cognitive level	Low
Safety Function	1
10 CFR 55	N/A
Technical Reference with Revision No:	NRC GF
Question History: (i.e. LGS NRC-05)	NRC Bank QID 1298
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	N/A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

42 **ID: 2495486** **Points: 1.00**

Unit 1 is operating at 80% Reactor Power when the following occurs:

- Reactor pressure rises to 1065 psig
- Reactor power rises to 87%

The PRO identifies:

- HV-041-1F022C "1C" Inboard MSIV Red light is off and the Green light is lit.

What confirming indications are available to verify the Main Steam Line isolation occurred?

A. Feedwater Level Control automatically activates MSIV Test Mode

B. Turbine Bypass Valves open to control pressure

C. A, B and D MSL flow of 4.4 mlbm/hr steam flow each

D. "1C" Main Steam Isolation Logic White light on the 10C603 panel is extinguished

Answer: C

Answer Explanation	
ANSWER (C)	**A, B and D MSL flow of 4.4 E+6 mlbm/hr steam flow each is correct:** Assessing the integrated response to the 1C MSIV inboard closing, the applicants should determine that the steam generated in the vessel is forced through the remaining 3 steam lines providing confirming indication that the valve has closed AND that the distractors are incorrect. With the rise in power and pressure, total steam flow at 87% power is approximately 13.2 Mlbm/hr total. divided by three gives approx.4.40 mlbm/hr steam flow through the remaining steam lines. This would be a solid confirming indication of the steam line isolation.
DISTRACTOR (A)	**Feedwater Level Control automatically activates MSIV Test Mode is wrong:** Feedwater Level Control MSIV Test mode is manually activated. Plausible as this mode would mode is designed to allow for testing and operating with an isolated steam line. This changes the calculation of steam flow to consider only the steam flow values in 3 of 4 steam lines allowing FWLC to maintain normal Level. Such as a closure of a Turbine or Main steam line valve. This is wrong as this mode is only manually initiated not automatic.
DISTRACTOR (B)	**Turbine Bypass Valves open to control pressure is wrong:** Plausible distractor to the candidate as the confirming indication for Main Turbine Stop valve and control valve closure is 1 or more open BPVs. This is due to the location of the BPVs in relation to the main turbine valves. In this scenario, the rising pressure from the closed MSIV is not seen by DEHC system because that pressure is sensed at the pressure averaging manifold (PAMS) which is downstream of the MSIVs. If anything, the DEHC system sees lower pressure due to the headloss of high flow through only 3 steam lines.
DISTRACTOR (D)	**"1C" Main Steam Isolation Logic White light on the 10C603 panel is extinguished is wrong:** Plausible indication as the MSIV logic indication would show if there were conditions present that necessitated isolating the Steam lines. The logic of NSSSS however requires 1 out of 2 twice logic to close the MSIVs and would close all the MSIVs at once, not just one. One extinguished light at worst indicates a half isolation signal. This would not close any valves.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 42 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495486
Version ID:	3194168
User-Defined ID:	Q #42 NEW
Cross Reference Number:	CLOSED
Topic:	MSIV Closes Diverse Indications
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	2
KA # and Rating	295020 / G2.1.45 4.3
KA Statement	INADVERTENT CONTAINMENT ISOLATION: CONDUCT OF OPERATIONS Ability to identify and interpret diverse indications to validate the response of another indication
Cognitive level	High
Safety Function	5
10 CFR 55	41.7
Technical Reference with Revision No:	OT-102 Rev.032
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1550.03

43 **ID: 2495350** **Points: 1.00**

Unit 1 plant conditions are as follows:

· Backup Service Air Compressor is in AUTO and aligned to Unit 1
· Service Air/Instrument Air cross-tie is aligned to the 1A Instrument Air header

An Equipment Operator (EO) reports a major leak on the Instrument Air System

ON-119, "Loss of Instrument Air" is entered

The RO checks Instrument Air Header Pressures with the following results:

- 1A Header = 70 psig
- 1B Header = 68 psig

PV-015-167 valve position will be _____(1)_____, Service Air Loads are supplied by _____(2)_____?

A. (1) open
(2) Service Air Compressor

B. (1) open
(2) Backup Service Air Compressor

C. (1) closed
(2) Service Air Compressor

D. (1) closed
(2) Backup Service Air Compressor

Answer: D

Answer Explanation

As pressure in the instrument air headers lowers the following occurs:

- the instrument air compressors continue to supply the instrument air headers
- When the IA header pressure drops below the SA header pressure, the SA compressor services both the IA header (for which it is aligned to) and the service air header
- Per the ON-119 basis, when SA header pressure lowers to 90 psi, the Backup Service Air Compressor starts and supports the SA header and when pressure in both IA headers lowers below 70 psi PV-015-*67 closes to isolate service air header from the service air compressor. This allows the Service Air compressor to be dedicated to supply the more vital Instrument Air header.

ANSWER (D)	**(1) closed, (2) Backup Service Air Compressor; Correct:** For the above reasons
DISTRACTOR (A)	**(1) open (2) Service Air Compressor; Wrong:** Plausible misconception that the *67 valve cross connecting SA to IA would receive an open signal on lowering pressure to maintain IA pressure. For the second part of the answer option, the Service Air Compressor is plausible as the supply to Service Air because it is the normal supply. Incorrect because low IA header pressure will close the *67 valve which isolates the SA compressor from the SA header..
DISTRACTOR (B)	**(1) open (2) Backup Service Air Compressor; Wrong:** Plausible misconception that the *67 valve cross connecting SA to IA would receive an open signal on lowering pressure to maintain IA pressure. The second part of the answer option is correct.
DISTRACTOR (C)	**(1) closed, (2) Service Air Compressor; Wrong:** The first part of the answer option is correct but could also be chosen based on a plausible misconception that the *67 valve closed to isolate the Service Air header from the instrument air header to preserve service air header pressure. For the second part of the answer option, the Service Air Compressor is plausible as the supply to Service Air because it is the normal supply. .

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 43 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495350
Version ID:	3195071
User-Defined ID:	Q #43 NEW
Cross Reference Number:	CLOSED
Topic:	Instrument Air System Valves
Num Field 1:	LM
Num Field 2:	ROLow
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295019 AA1.02 3.2
KA Statement	Ability to operate or monitor the following as they apply to (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:System Valves
Cognitive level	Low
Safety Function	8 - Plant Service Systems
10 CFR 55	41.5
Technical Reference with Revision No:	M-0015 sh1 Rev.057 M-0015 sh4 Rev.040
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0015.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

44 **ID: 2507328** **Points: 1.00**

Unit 1 is shut down for refueling on day 1, Unit 2 is operating at 100% :

· 20 Bus Startup Feed trips open

WHICH ONE of the following identifies the status of the following equipment two minutes later?

	1B Circ Water Pump	2A Condensate Pump
A.	Energized	Energized
B.	Energized	De-Energized
C.	De-energized	Energized
D.	De-energized	De-Energized

Answer: C

Answer Explanation

1B CIRC Pump is powered from the 12 Aux Bus (13.2 KV)
2A Condensate Pump is powered from 21 Aux Bus (13.2 KV)

ANSWER (C)	**De-energized, Energized;** Correct, as noted above, the 1B Circ water pump is powered from the 12 Aux bus, which is fed from the 20 bus normally when the plant is off line and house loads are transferred. On a trip of the 20 bus, the feed to the 12 bus is de-energized and all loads are de-energized. The 2A condensate pump is powered from the 21 bus. In a normal operating lineup, the 21 bus is powered from the 2 main generator through the Aux transformer. The loss of the alternate feed from the 20 bus would have no impact.
DISTRACTOR (A)	**Energized, Energized;** Wrong, The first part of the answer option is plausible because in a normal on line electrical lineup, the loss of the 20 bus would have no impact as described above. It is wrong as the 12 Bus would be de-energized from the loss of the 20 bus feed.. The second part is correct
DISTRACTOR (B)	**Energized, De-energized;** Wrong, The first part of the answer option is plausible because in a normal on line electrical lineup, the loss of the 20 bus would have no impact as described above. It is wrong as the 12 Bus would be de-energized from the loss of the 20 bus feed.. The second part is plausible as a candidate may not recall that the main generator is supplying the 21 bus with the unit online. In this scenario, power is not lost.
DISTRACTOR (D)	**De-energized, De-energized;** Wrong, The second part is plausible as a candidate may not recall that the main generator is supplying the 21 bus with the unit online. In this scenario, power is not lost.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 44 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507328
Version ID:	3194551
User-Defined ID:	Q #44 NEW
Cross Reference Number:	CLOSED
Topic:	Partial loss of 20 bus - System electrical loads
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295003AA1.06 3.8
KA Statement	Ability to operate or monitor the following as they apply to (APE 3) PARTIAL OR COMPLETE LOSS OF AC POWER: AC electrical loads
Cognitive level	
Safety Function	6
10 CFR 55	41.5
Technical Reference with Revision No:	E-12 sht. 2. Rev 14 E-13 sht. 1 Rev.16
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0035.8

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

45 **ID: 2495784** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor refueling is in progress
- 1B RPS/UPS, "Inverter AC Feed Switch" (10NBX160) is aligned to Secondary Alternate Supply
- The UPS Inverter Bypass Switch is in Bypass position
- All RPS white status lights are lit

WHICH ONE of the following identifies the source currently providing power to 1BY160?

A. 1DB-1 250 VDC

B. 1DB-2 250 VDC

C. MCC 144D-C-F

D. MCC 124A-G-F

Answer: D

Answer Explanation

The normal (preferred) power to the RPS/UPS inverter is from Divisional DC. For the 1B inverter, that would be Division 2, 250 VDC from 1DB-2. The primary alternate power is from the TSC UPS inverter and 144D-C-F through the manual transfer switch 10NBX160. The secondary alternate source is from MCC 124A-G-F.

For Maintenance during outages, the UPS will be removed from service and the alternate will supply power. The TSC (144D-C-F) is the preferred alternate but the secondary alternate is sometimes required (124A-G-F)

ANSWER (D)	**MCC 124A-G-F is correct:** As noted in the stem, the Inverter Bypass switch is in the Bypass position. This means that the UPS inverter is not in service and power must be supplied by one of the two alternate sources. Switch 10NBX160 is selected to the secondary alternate which is the 124A-G-F
DISTRACTOR (A)	**1DB-1 250 VDC is wrong:** Plausible supply as the normal supply to the inverter is 250 VDC but not this source.
DISTRACTOR (B)	**1DB-2 250 VDC is wrong:** Plausible answer for the power supply as this is the normal power supply to the RPS UPS inverter and by extension 1BY160. However, with the Inverter Bypass switch in bypass position, this cannot be the source.
DISTRACTOR (C)	**MCC 144D-C-F is wrong:** Plausible source as this is the normal alternate source for AC power when the UPS is bypassed. However, as noted above, the transfer switch 10NBX160 is selected to the 2nd alternate source which is 124A-G-F .

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 45 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495784
Version ID:	3185631
User-Defined ID:	Q #45 NEW
Cross Reference Number:	CLOSED
Topic:	RPS/UPS static inverter
Num Field 1:	LM
Num Field 2:	RO- LOW
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	262002 K2.01 3.3
KA Statement	UNINTERRUPTABLE POWER SUPPLY (AC/DC) Knowledge of electrical power supplies to the following: Static Switch/Inverter
Cognitive level	Low
Safety Function	6 - Electrical
10 CFR 55	41.7
Technical Reference with Revision No:	S94.9.A Rev 017 E-0032 Sheet 01 Rev 065 E-0032 Sheet 02 Rev 040
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0071.13

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

46 **ID: 2495760** **Points: 1.00**

Regarding the Standby Gas Treatment System, which of the following describes

1) The basis for the SGTS filter train and

2) The design feature to maintain filter efficiency

	Basis for SGTS Filter Train	Component to Maximize Filter Efficiency
A.	Limit iodine and particulate concentration in gases, prior to discharge	Electric Heaters
B.	Limit iodine and particulate concentration in gases, prior to discharge	Purge Air
C.	Limit particulate concentration ONLY in gases, prior to discharge	Electric Heaters
D.	Limit particulate concentration ONLY in gases, prior to discharge	Purge Air

Answer: A

Answer Explanation	
ANSWER (A)	**Limit iodine and particulate concentration in gases, prior to discharge, Electric Heaters is correct:** The purpose of the SBGT filters per the Design basis document L-S-32 is "The SGTS/RERS filters iodine and particulate concentrations in gases potentially present within the Secondary Containment prior to discharge to the environment via the North Stack." and for efficiency "Upon initiation of the SGTS, either manually or automatically, the **SGTS heaters** are energized to maintain relative humidity of the airstream entering the SGTS filter trains below 70%. This ensures design charcoal filter efficiency for the removal of halogen and particulate concentrations in gases potentially present.
DISTRACTOR (B)	**Limit iodine and particulate concentration in gases, prior to discharge, Purge Air is wrong:** The first part of the answer option is correct. The second part is a plausible answer to the question of filter efficiency because "Purge air to the SGTS filter train is maintained to prevent condensation of water vapor on the charcoal filters". Incorrect because the specific design function of the electric heaters is to maintain filter efficiency.
DISTRACTOR (C)	**Limit particulate concentration ONLY in gases, prior to discharge, Electric Heaters is wrong:** Plausible answer to the first part of the answer option as the function of the HEPA filter in the filter train is to limit particulate concentration in the exhaust, however, the charcoal portion of the filter is designed for iodine adsorption. The second part is correct
DISTRACTOR (D)	**Limit particulate concentration ONLY in gases, prior to discharge, Purge Air is wrong:** Plausible answer to the first part of the answer option as the function of the HEPA filter in the filter train is to limit particulate concentration in the exhaust, however, the charcoal portion of the filter is designed for iodine adsorption. The second part is a plausible answer to the question of filter efficiency because "Purge air to the SGTS filter train is maintained to prevent condensation of water vapor on the charcoal filters". Incorrect because the specific design function of the electric heaters is to maintain filter efficiency

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 46 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495760
Version ID:	3185632
User-Defined ID:	Q #46 NEW
Cross Reference Number:	CLOSED
Topic:	SBGT Fission Product Removal
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	261000 K4.05 3.3
KA Statement	Knowledge of (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM design features and/or interlocks that provide for the following: Fission product gas removal
Cognitive level	Low
Safety Function	9
10 CFR 55	41.7
Technical Reference with Revision No:	DBD L-S-32 Rev.009
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0076B.09

47 **ID: 2495580** **Points: 1.00**

Unit 1 plant conditions are as follows:

A Loss of Coolant Accident occurs

- Drywell pressure is 2.5 psig
- Reactor water level lowered to -100 inches and has been restored to -75 inches with Condensate
- Offsite power remains available
- Reactor pressure is 310 psig and **steady**

WHICH ONE of the following describes the response of HV-51-1F017A, "1A" RHR LPCI INJ PCIV, and the HV-51-1F007A, "1A" RHR MIN FLOW

	HV-51-1F017A	HV-51-1F007A
A.	Remains Closed	Remains Open
B.	Opens	Closes
C.	Remains Closed	Opens
D.	Opens	Remains Open

Answer: D

Answer Explanation
With the LOCA signal initiated the LOCA signal seals in. The LPCI F017 valve will open as soon as the 74 psi delta pressure permissive is met, however there will be no flow to the vessel until RHR pressure is greater than reactor pressure. Until RHR pressure is greater than reactor pressure the min flow valve will remain open. RHR shutoff head pressure is approximately 260 psig. Given the stem conditions the HV-51-1F017A is within the 74 psi delta P permissive to open but there will be no flow to the vessel so the min flow valve will remain open.

ANSWER (D)	**Opens, Remains Open is correct: T**he LPCI injection valve HV-51-1F017A will open and the min flow valve HV-051-1F007A will remain open
DISTRACTOR (A)	**Remains Closed, Remains Open is wrong:** The first part of the answer option is plausible because the 17A will not open until the permissive is satisfied and the candidate must recall the delta pressure setpoint and calculate the current delta press to answer. The second part is correct.
DISTRACTOR (B)	**Opens, Closes is wrong:** The first part of the answer option is correct. The second part is plausible because the Min flow valve will close when RHR pump is injecting. Incorrect because RHR pump discharge pressure is lower than reactor pressure, so the min flow valve will remain open until RPV pressure is below the shutoff head of the pump.
DISTRACTOR (C)	**Remains Closed, Opens is wrong:** The first part of the answer option is plausible because the 17A will not open until the permissive is satisfied and the candidate must recall the delta pressure setpoint and calculate the current delta press to answer. The second part is plausible because the Min flow valve will close when RHR pump is injecting. Incorrect because RHR pump discharge pressure is lower than reactor pressure, so the min flow valve will remain open until RPV pressure is below the shutoff head of the pump

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 47 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495580
Version ID:	3185633
User-Defined ID:	Q #47 BANK
Cross Reference Number:	CLOSED
Topic:	"1A" RHR Low Level Valve Operation
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	203000 A3.01 4.0
KA Statement	Ability to monitor automatic operation of the (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE including: Valve operation
Cognitive level	High
Safety Function	2
10 CFR 55	41.7
Technical Reference with Revision No:	E11-1040-E-061, 67 Rev.001
Question History: (i.e. LGS NRC-05)	2016 NRC
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0051.8g

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

48 **ID: 2495297** **Points: 1.00**

Considering the Main Turbine Stop Valves input to RPS, WHICH ONE of the following identifies the Scram signal setpoint and describes the basis for this RPS trip during 100% power operation?

	Scram Signal Setpoint	Basis for RPS Trip
A.	Oil Pressure less than 500 psig	Anticipates the RPV pressure, neutron flux, and heat flux increase
B.	Oil Pressure less than 500 psig	Prevent rapid pressurization such that the Safety Limit MCPR is not exceeded due to imminent bypass valve closure
C.	Valve Position less than 95% open	Anticipates the RPV pressure, neutron flux, and heat flux increase
D.	Valve Position less than 95% open	Prevent rapid pressurization such that the Safety Limit MCPR is not exceeded due to imminent bypass valve closure

Answer: C

Answer Explanation

From Tech Spec Limiting Safety System Settings Bases page B 2-9:

9. Turbine Stop Valve-Closure

The turbine stop valve closure trip anticipates the pressure, neu
flux, and heat flux increases that would result from closure of the st
valves. With a trip setting of 5% of valve closure from full open, th
resultant increase in heat flux is such that adequate thermal margins
maintained during the worst design basis transient.

Distractor from TRM Bases B3/4 7.8

3/4 7.8 MAIN TURBINE BYPASS SYSTEM

The main turbine bypass system is required to be OPERABLE to limit peak pressure in the main steam lines and to maintain reactor pressure within acceptable limits during events that cause rapid pressurization such that the Safety Limit MCPR is not exceeded. With the main turbine bypass system inoperable, continued operation is based on the cycle specific transient analysis which has been performed for the feedwater controller failure, maximum demand with bypass failure.

ANSWER (C)	**Valve Position less than 95% open, Anticipates the RPV pressure, neutron flux, and heat flux increase are correct:** Correct for the reasons noted above
DISTRACTOR (A)	**Oil Pressure less than 500 psig, Anticipates the RPV pressure, neutron flux, and heat flux increase is wrong:** The first part of the answer option is plausible because the Oil pressure trip is an RPS trip signal for the Main Turbine Control Valves but not the Stop Valves. The RPS input for the stop valves uses valve position. The second part of the answer option is correct.
DISTRACTOR (B)	**Oil Pressure less than 500 psig, Prevent rapid pressurization such that the Safety Limit MCPR is not exceeded due to imminent bypass valve closure is wrong:** Plausible because the Oil pressure trip is an RPS trip signal for the Main Turbine Control Valves but not the Stop Valves and prevent rapid pressurization such that the Safety Limit MCPR is not exceeded due to imminent bypass valve closure is a operability concern but not the reason for the RPS action
DISTRACTOR (D)	**Valve Position less than 95% open, Prevent rapid pressurization such that the Safety Limit MCPR is not exceeded due to imminent bypass valve closure is wrong:** The first part of the answer option is correct. The second part is plausible because prevent rapid pressurization such that the Safety Limit MCPR is not exceeded due to imminent bypass valve closure is a operability concern but not the reason for the RPS action.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 48 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495297
Version ID:	3193821
User-Defined ID:	Q #48 BANK
Cross Reference Number:	CLOSED
Topic:	Stop Valve Scram setpoint and bases
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295006 AK1.04 4.1
KA Statement	Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (APE 6) SCRAM: Pressure Control
Cognitive level	Low
Safety Function	1
10 CFR 55	41.7
Technical Reference with Revision No:	Tech Spec 2.0 Basis #9
Question History: (i.e. LGS NRC-05)	2017 Dec NRC
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0071.13

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

49 **ID: 2507320** **Points: 1.00**

Unit 2 is at 100% power when lowering Main Condenser Vacuum is identified.

The crew is responding in accordance with OT-116, Loss of Condenser Vacuum.

- Condenser Vacuum is 25” Hg Vac, lowering at a rate of 0.5” / min
- Off Gas Flow is currently 100 SCFM rising at a rate of 50 SCFM/min.

WHICH ONE of the following identifies the earliest an OT-116 SCRAM Threshold is met? (assume the rates of change remain constant)

A. 2 minutes

B. 3 minutes

C. 4 minutes

D. 6 minutes

Answer: C

Answer Explanation

From the stem the candidate identifies that after 1 minute offgas flow will be 150 SCFM, 2 minutes offgas flow will be 200 SCFM, 3 minutes - 250 SCFM, and 4 minutes - 300 SCFM.

Applying this information to OT-116 step 3.2

3.2 **ESTABLISH** two critical parameters: [ ]

Off Gas Flow

Reporting Interval: _____

SCRAM Threshold: **300 scfm**

Condenser Vacuum

Reporting Interval: _____

SCRAM Reactor & **MANUALLY** Trip Main Turbine: **22" Hg Vac and lowering**

3.8 **IF** source of dropping vacuum **cannot** be eliminated,
AND there is sustained Off Gas system flow exceeding 200 scfm
THEN PERFORM one of the following:

3.8.2 **IF** power is greater than 5%,
THEN PERFORM GP-4, Rapid Plant Shutdown to Hot Shutdown.

So, using the stem info:

Time	Offgas Flow	Vacuum	Action required / Alarm
T=0	100	25	
2	200	24	Perform GP-4 for Off Gas 200 scfm
3	250	23.5	Low Cond Vacuum Alarm
4	**300**	**23**	**SCRAM Off Gas 300 scfm**
6	N/A	22	SCRAM Main Turbine: 22" Hg Vac

ANSWER (C)	**4 minutes:** Correct, As described above at time 4 minutes Off Gas flow is 300 SCFM. Per OT-116 this meets the Off Gas Flow SCRAM Threshold
DISTRACTOR (A)	**2 minute:** Wrong, As described above at time 2 minutes Off Gas flow is 200 SCFM, Plausible as Off Gas flow of 200 SCFM does met the requirement for a GP-4 for Off Gas flow however this is not a critical parameter scram threshold per OT-116
DISTRACTOR (B)	**3 minutes:** Wrong, As described above, at time 3 minutes Off Gas flow is 250 SCFM, and Condenser Vacuum is 23.5" neither required a SCRAM. Plausible as Condenser Vacuum is at the low Cond Vacuum Alarm setpoint .
DISTRACTOR (D)	**6 minutes:** Wrong, As described above the Off gas SCRAM value was reached at 4 minutes. Plausible as Condenser Vacuum is 22" which would require a SCRAM if it had not already occurred due to Off Gas flow.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 49 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507320
Version ID:	3195121
User-Defined ID:	Q #49 NEW
Cross Reference Number:	CLOSED
Topic:	OT-116 - Loss of Vacuum - Offgas system
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	2
KA # and Rating	295002 AK1.04 3.4
KA Statement	Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Loss of Main Condenser Vacuum: (CFR: 41.8 to 41.10) Offgas flow changes
Cognitive level	High
Safety Function	4
10 CFR 55	41.7
Technical Reference with Revision No:	OT-116 Rev.046
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0001.06

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

50 **ID: 2495415** **Points: 1.00**

Unit 2 experiences a fuel failure

An unisolable RWCU leak cause an offsite release

- RWCU regen htx room rad level is >10,000 mr/hr (MSO)
- Turbine HVAC has tripped

What is the lowest EP threshold Rad Level for T-104 entry?

and

What is required to be performed to mitigate the release?

	T-104 Entry Required	Action to Mitigate Release
A.	Site Area	Restart Turbine Bldg HVAC
B.	Site Area	Blowdown per T-103
C.	Alert Level	Restart Turbine Bldg HVAC
D.	Alert Level	Blowdown per T-103

Answer: C

Answer Explanation	
ANSWER (C)	**Alert Level, Restart Turbine Bldg HVAC is correct.** The entry condition for T-104 is Offsite release above ALERT level per EP-AA-1008,Addendum 3 (Hot Matrix). This offsite level is where Dose assessment is required and all the EP organizations are staffed. Step RR-2 is an override step to ensure that TE HVAC is in service. This will help ensure that any rad releases are through the ventilation system, elevated and monitored. It also provides for habitability for any access issues.
DISTRACTOR (A)	**Site Area, Restart Turbine Bldg HVAC is wrong**. The first part of the answer option is plausible because an offsite release is the entry condition to T-104; however, T-104 entry is required at the "Alert" level. The second part is correct.
DISTRACTOR (B)	**Site Area, Blowdown per T-103 is wrong**. The first part of the answer option is plausible because an offsite release is the entry condition to T-104; however, T-104 entry is required at the "Alert" level. The second part is plausible because High rad level in RWCU above the MNO level is a T-103 entry. Radiation levels above 10,000 mr/hr are generally MSO levels and two such reading in two different areas would require a blowdown per step SCC-12. However, only 1 area is above the required level.
DISTRACTOR (D)	**Alert Level, Blowdown per T-103 is wrong**: The second part is plausible because High rad level in RWCU above the MNO level is a T-103 entry. Radiation levels above 10,000 mr/hr are generally MSO levels and two such reading in two different areas would require a blowdown per step SCC-12. However, only 1 area is above the required level. .

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 50 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495415
Version ID:	3195051
User-Defined ID:	Q #50 NEW
Cross Reference Number:	CLOSED
Topic:	T-104, exceeding limits for release
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	N/A
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295038 G2.4.18 3.3
KA Statement	HIGH OFFSITE RADIOACTIVITY RELEASE RATE: EMERGENCY PROCEDURES / PLAN: Knowledge of the specific bases for emergency and abnormal operating procedures
Cognitive level	Low
Safety Function	9
10 CFR 55	CFR: 41.10 / 43.1
Technical Reference with Revision No:	T-104 Rev 14 T-104 Basis Rev.016
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1560.5

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

51 **ID: 2495616** **Points: 1.00**

Unit 2 plant conditions are as follows:

- OPCON 4
- 4 kV busses aligned normally
- “2B” RHR is in Shutdown Cooling per S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up And Shutdown
- "0B" RHRSW Pump is in service
- Reactor coolant temperature is 190 °F and slowly lowering

An electrical fault causes a loss of the 20 Station Aux Bus.

WHICH ONE of the following describes the effect on "2B" RHR Shutdown Cooling and the required action?

	Effect on "2B" RHR Shutdown Cooling	Required Action
A.	RHR Pump trips and cannot be restarted	Start "2A" RHR in Shutdown Cooling mode per S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up and Shutdown
B.	Remains in service without heat exchanger cooling water	Start "0A" RHRSW Pump per S12.1.A, RHR Service Water System Startup
C.	RHR Pump trips and cannot be restarted	Start "2D" RHR in Shutdown Cooling mode per S51.8.H, Use of Dedicated LPCI Pump for Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up and Shutdown
D.	Remains in service without heat exchanger cooling water	Start "0D" RHRSW Pump per S12.1.A, RHR Service Water System Startup

Answer: D

Answer Explanation

ANSWER (D)	**Remains in service without heat exchanger cooling water, Start "0D" RHRSW Pump per S12.1.A, RHR Service Water System Startup; Correct:** A loss of 20 Station Aux Bus will cause a loss of 201 Safeguard Bus and a loss of D12 until Dead Bus Transfer to the 101 Safeguard Bus occurs. This will trip the "0B" RHRSW Pump. "2B" Shutdown Cooling will remain in service without heat exchanger cooling due to D22 Bus being supplied from the 101 Bus (opposite alignment from Unit 1). "0D" RHRSW can be aligned for cooling the "2B" RHR Heat Exchanger.
DISTRACTOR (A)	**RHR Pump trips and cannot be restarted, Start "2A" RHR in Shutdown Cooling mode per S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up and Shutdown; Wrong:** Plausible outcome that the RHR pump trips because on Unit 1, D12 is supplied by the 201 bus. However, D22 is normally aligned to the 101 bus and therefore will remain energized. In that circumstance, starting 2A RHR would be correct making the second part of the answer option plausible.
DISTRACTOR (B)	**Remains in service without heat exchanger cooling water, Start "0A" RHRSW Pump per S12.1.A, RHR Service Water System Startup; Wrong:** The first part of the answer option is correct. As noted above, 0B RHRSW will trip. It is plausible to place 0A RHRSW in service, but it will be ineffective as long as 2B RHR is in service for S/D cooling.
DISTRACTOR (C)	**RHR Pump trips and cannot be restarted, Start "2D" RHR in Shutdown Cooling mode per S51.8.H, Use of Dedicated LPCI Pump for Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up and Shutdown; Wrong:** Plausible outcome that the RHR pump trips because on Unit 1, D12 is supplied by the 201 bus. However, D22 is normally aligned to the 101 bus and therefore will remain energized. Starting 2D RHR is a plausible action given the justification for part 1, but it would only swap the primary side pump without addressing the loss of RHRSW cooling...

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 51 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495616
Version ID:	3191522
User-Defined ID:	Q #51 BANK
Cross Reference Number:	CLOSED
Topic:	SDC Loss of Heat Sink
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	205000 K1.15 3.2
KA Statement	Knowledge of the physical connections and/or cause and effect relationships between the (SF4 SCS) SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following systems: Service water
Cognitive level	High
Safety Function	4 - Heat Removal From Reactor Core
10 CFR 55	41.2
Technical Reference with Revision No:	E-0015
Question History: (i.e. LGS NRC-05)	NRC 2019 #29
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0051.13d

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

52 **ID: 2504703** **Points: 1.00**

Unit 2 is operating at 100% power.

RPV water level drops to -130".

Two minutes later:

- A 101 Safeguard Transformer breaker trips open

WHICH ONE of the following describes the automatic response of the '2B' Core Spray Pump (If any)?

A. Remains running

B. Trips; restarts after time delay based on D22 D/G output breaker closure

C. Trips; restarts after time delay based on 201-D22 feeder breaker closure

D. Trips; remains shutdown

Answer: B

Answer Explanation

ANSWER (B)	**Trips; restarts after time delay based on D22 D/G output breaker closure is correct:** 2B Core Spray Pump is powered from D22. This bus is normally fed from the 101 Safeguard Bus which is powered from the 10 Station Aux Bus. On the 101 transformer breaker trip, the 101-D22 breaker will trip and the 2B Core Spray Pump will trip on undervoltage. Since the D22 Diesel is running, the D/G breaker will auto-close at t=0.5 seconds, and 2B Core Spray Pump will auto-start 7 seconds later based on the LOCA/LOOP start sequence.
DISTRACTOR (A)	**Remains running is wrong:** Plausible answer because Unit 1 B train equipment is generally associated with Division 2 of 4kv power. In that instance, the loss of the 101 feed would not impact the Div 2 4kv as it is powered from 201. However, on Unit 2, the D22 bus is normally powered from the 101 transformer feed via the 101 bus. A loss of this feed would momentarily de-energize the bus/pump until the alternate feed closed.
DISTRACTOR (C)	**Trips; restarts after time delay based on 201-D22 feeder breaker closure is wrong:** The first part of the answer option is correct. Plausible second part answer as this is a Unit 2 pump on D22 normally powered from the 101 feed. Incorrect since the D22 EDG is running due to the LOCA signal, and the D22 diesel breaker closes in 0.5 second.
DISTRACTOR (D)	**Trips; remains shutdown is wrong:** The first part of the answer option is correct. The second part is plausible because the pump will trip on undervoltage and the anti-pumping logic on its 4kv breaker can prevent an auto closure if it is triggered. In this instance, the LOCA and the loss of power occur far enough apart that this is not a concern

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 52 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	6
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504703
Version ID:	3194070
User-Defined ID:	Q #52 BANK
Cross Reference Number:	CLOSED
Topic:	Effect of Loss of 101 Bus on Core Spray Pumps following LOCA
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	209001 K6.01 4.2
KA Statement	Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM: Loss of the AC Electrical Distribution System
Cognitive level	High
Safety Function	2
10 CFR 55	41.7
Technical Reference with Revision No:	SE-10
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0051.08

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

53 **ID: 2504676** **Points: 1.00**

Unit 2 plant conditions are as follows:

- Reactor scram was attempted with the following results:
  - All blue scram lights are lit
  - ARC-MCR 207 C-1 Scram Discharge Volume Hi Level Trip is Lit
  - Reactor level is -55” steady
  - Reactor power is 10%

Operators are performing T-217, "RPS/ARI Reset and Backup Method of Draining Scram Discharge Volume"

- An EO notifies the MCR that T-217 steps 4.1.1 through 4.1.6 are complete (ready for MCR action):

WHICH ONE of the following list ALL MCR actions required to support T-217 performance?

A. Scram reset switch at 10C603 placed to "GP1/4" AND to "GP2/3 ONLY

B. ARI RESET pushbuttons depressed and released ONLY

C. Scram reset switch at 10C603 placed to "GP1/4" AND to "GP2/3."
AND
ARI RESET pushbuttons depressed and released ONLY

D. Scram Discharge Volume High Level Bypass Keylock Switch placed in "BYPASS
AND
Scram reset switch at 10C603 placed to "GP1/4" AND to "GP2/3."
AND
ARI RESET pushbuttons depressed and released

Answer: C

Answer Explanation

ANSWER (C)	**Scram reset switch at 10C603 placed to "GP1/4" AND to "GP2/3.", ARI RESET pushbuttons depressed and released ONLY is Correct:** T-217 field actions bypass all scram signal and allow for RPS and ARI Reset.
DISTRACTOR (A)	**Scram reset switch at 10C603 placed to "GP1/4" AND to "GP2/3 ONLY is wrong:** As noted above bypass of Both RPS and ARI is required to reset the scram. Plausible as an operator may believe that as the SDV high level trip is an RPS trip signal, only RPS reset is required, and bypassing of ARI is not required to drain the SDV
DISTRACTOR (B)	**ARI RESET pushbuttons depressed and released ONLY is wrong**: As noted above Bypass of Both RPS and ARI is required to reset the scram. Plausible as an operator may believe that ARI reset will allow for bypassing of all existing scram/rps signals.
DISTRACTOR (D)	**Scram Discharge Volume High Level Bypass Keylock Switch placed in "BYPASS, Scram reset switch at 10C603 placed to "GP1/4" AND to "GP2/3." ARI RESET pushbuttons depressed and released is wrong:** As noted above, bypass of Both RPS and ARI is required to reset the scram. Scram Discharge Volume High Level Bypass Keylock Switch being placed in "BYPASS is not required as T-217 Field action bypass that scram signal. Plausible as SDV high level trip is an RPS trip signal, and is required to be bypassed to drain the SDV in a normal reset scenario.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 53 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	6
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504676
Version ID:	3195126
User-Defined ID:	Q #53 NEW
Cross Reference Number:	CLOSED
Topic:	RPS Reset
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-R

Comments:

References Provided	None
K/A Justification	This question requires the operator to recall the purpose of and actions in T-217. That procedure will BYPASS the existing scram signals and ARI signals which are maintaining the air header depressurized.
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	212000 A4.04 3.7
KA Statement	Ability to manually operate and/or monitor the (SF7 RPS) REACTOR PROTECTION SYSTEM in the control room: Bypass SCRAM signals
Cognitive level	High
Safety Function	7
10 CFR 55	41.7
Technical Reference with Revision No:	GP-11.1 U/1 Rev.000
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0072.04

54 **ID: 2505242** **Points: 1.00**

Unit 1 plant conditions are as follows:

- 75% Power
- B TECW Pump is in service
- A TECW Pump is in AUTO
- Normal electrical lineup

The following events occur:

- A total loss of offsite power occurs
- All Unit 1 Diesel Generators start
- The D11 Diesel Generator Output Breaker trips immediately on overcurrent
- All remaining Diesel Generator output breakers close

WHICH ONE of the following identifies the status of the TECW Pumps two (2) minutes following the LOOP?

	A TECW	B TECW
A.	Running	Running
B.	Running	Off
C.	Off	Running
D.	Off	Off

Answer: C

Answer Explanation

ANSWER	**Off, Running; Correct:** 1A and 1B TECW pumps are powered from D114-G-D and D124-G-D respectively. On a loss of power, those MCCs are load shed. The EDG will start and closes in on the bus in approximately 7-10 seconds. 5 seconds after the bus is re-energized D114-G-D and D124-G-D re-energize, Both the A and B pump would restart on low pressure (<29#), "A" pump however, will not auto start as power supply is unavailable (D114-G-D) when D11 trips on breaker closure. Therefore only the B pump will be running.
DISTRACTOR	**Running, Running; Wrong:** Plausible to the candidate who recalls that both pumps will start on Low pressure since both pumps normal switch position is in AUTO. When the busses are re-energized, simultaneously, both pumps would start. The candidate may assess that on a trip of the D11 EDG, the alternate offsite feed would close in to power the bus. This is incorrect as both offsite feeds are lost.
DISTRACTOR	**Running, Off; Wrong:** Plausible answer given that B pump was running and A pump is described as handswitch in AUTO. On a loss and subsequent repowering of the electrical feed, the candidate may determine that A pump would be the lead/primary pump to start assuming that an alternate power source was available. However, since D11 bus is de-energized, 1A TECW would not run.
DISTRACTOR	**Off, Off; Wrong:** Plausible to the operator who assumes that LOOP logic is the same as LOCA logic for the G-D Load center believing that operators must reset the bus by closing the breaker manually as on SE-10 actions.This manual action is not required for a temporary loss of power. When power is restored, the load center breaker will auto close in 5 seconds later.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 54 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	6
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2505242
Version ID:	3185807
User-Defined ID:	Q #54 BANK
Cross Reference Number:	CLOSED
Topic:	TECW pp response to Low Pressure
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	400000 A1.03 3.0
KA Statement	Ability to predict and/or monitor changes in parameters associated with operation of the (SF8 CCS) COMPONENT COOLING WATER SYSTEM including: CCW pressure
Cognitive level	Low
Safety Function	8
10 CFR 55	41.5
Technical Reference with Revision No:	E-0565 Rev.010
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0014.05A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

55 **ID: 2495795** **Points: 1.00**

Which of the following DC distribution systems have a direct reading ground detection system (not white lights) and why is ground detection important?

	System	Importance
A.	Non Safeguard 125 / 250VDC Battery System	A grounded system is a personnel electrical safety hazard
B.	Non Safeguard 125 / 250VDC Battery System	Multiple grounds could cause equipment failures or system actuations
C.	Safeguard 125 / 250VDC Battery System	A grounded system is a personnel electrical safety hazard
D.	Safeguard 125 / 250VDC Battery System	Multiple grounds could cause equipment failures or system actuations

Answer: B

Answer Explanation

2 types of battery ground detection are in use at LGS. The 1st type is the original ASCO system installed on Safeguard DC panels and 250VDC 1PP and 2PP 250VDC panels (EBOP/ ESOP power). These panels have multiple white lights which will illuminate more brightly or less brightly when a ground is present. With no ground they burn equally bright. At a certain threshold ground current, an alarm relay (Sigma) is activated to bring in a MCR alarm. No quantification of the ground is possible beyond gross measures of light intensity.

The second system is the Bender DC ground detection system which injects AC onto the DC system and can provide a direct Kohm resistance reading on a panel and is monitored in the MCR. This system is installed on Non-Safeguard 125/250VDC panels.

ANSWER (B)	**Non Safeguard 125 / 250VDC Battery System, Multiple grounds could cause equipment failures or system actuations is correct:** As discussed above, the Bender system is installed on Non Safeguard DC systems. Ground detection is important because multiple grounds can lead to "ground loops", inadvertent current flow paths which could actuate safety systems and trip protective relays if not controlled.
DISTRACTOR (A)	**Non Safeguard 125 / 250VDC Battery System, A grounded system is a personnel electrical safety hazard is wrong:** The first part of the answer option is correct. Personnel electrical safety hazard is a plausible distractor Personnel is a plausible distractor and a valid concern when designing electrical systems. A common misperception is that ungrounded systems are designed for personnel safety. This is false as noted above, the ground loops can play Havoc with protective relaying.
DISTRACTOR (C)	**Safeguard 125 / 250VDC Battery System, A grounded system is a personnel electrical safety hazard is wrong:** Plausible misconception that the Safeguard bus is more important than the non-safeguard bus and therefore would have the more advanced ground detection system. This is incorrect. Personnel electrical safety hazard is a plausible second part distractor and a valid concern when designing electrical systems. A common misperception is that ungrounded systems are designed for personnel safety. This is false as noted above, the ground loops can play Havoc with protective relaying
DISTRACTOR (D)	**Safeguard 125 / 250VDC Battery System, Multiple grounds could cause equipment failures or system actuations is wrong:** Plausible misconception that the Safeguard bus is more important than the non-safeguard bus and therefore would have the more advanced ground detection system. This is incorrect. The second part of the answer option is correct

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 55 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495795
Version ID:	3185810
User-Defined ID:	Q #55 NEW
Cross Reference Number:	CLOSED
Topic:	Battery Ground Detection
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	263000 K4.03 2.9
KA Statement	Knowledge of (SF6 DC) DC ELECTRICAL DISTRIBUTION design features and/or interlocks that provide for the following: Ground detection
Cognitive level	Low
Safety Function	6
10 CFR 55	41.7
Technical Reference with Revision No:	ARC-MCR-122 F5 Rev.006 ARC-MCR-125 B1 Rev.015
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0095.07

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

56 **ID: 2496003** **Points: 1.00**

Unit 1 is operating at 100% power, with the following:

- Circulating Water System is operating normally
- Outside air temperature is 95°F
- Circ Water Temperature is 92° F

The '1C' Circulating Water Pump trips.

Main Condenser vacuum has lowered to 23.1 inches Hg and is down slow

WHICH ONE of the following identifies:

a) the **initial** effect on Cooling Tower Blowdown flow and
b) if a Power reduction is required due to the impact on the plant from the Circulating Water Pump trip?

	Initial Effect on Blowdown Flow	Power Reduction Required
A.	Cooling Tower Blowdown flow lowers	No
B.	Cooling Bower Blowdown flow lowers	Yes
C.	Cooling Tower Blowdown flow rises	No
D.	Cooling Tower Blowdown flow rises	Yes

Answer: D

Answer Explanation	
ANSWER (D)	**Cooling Tower Blowdown flow rises, Yes is correct:** With a trip of a Circ Pump, Cooling Tower level will rise due to reduced flow to the suction of the tripped pump. This will increase blowdown flow. With a tripped Circ Pump, Condenser vacuum will begin to drop. This requires entry into OT-116. It is no longer an immediate operator action to lower power. The current direction is to evaluate the condenser vacuum trend and make a decision based on that. In this case, the current vacuum is just below the low vacuum alarm setpoint. (23.5") . On a hot day, it is acceptable (per ARC 104-E5) to not lower power if vacuum drops below the alarm setpoint due to expected conditions such as a very hot day. However, when vacuum drops to 23.1" HG, power reduction is required. In this scenario, due to the loss of a Circ water pump, power reduction would be imperative. The required action is to lower power to improve vacuum. The note on page 2 describes the evaluation required. (RO knowledge)
DISTRACTOR (A)	**Cooling Tower Blowdown flow lowers, No is wrong: "**Cooling Tower Blowdown flow lowers" is plausible because CT blowdown is effected in the event of a Circ water pump; however, this is the opposite of the correct response: A tripped pump will result in a higher CT basin level and therefore more blowdown flow which is gravity fed. It is plausible that no action is required if the candidate evaluates the current vacuum and determines that it is above the OT-116 immediate operator action level of 22 inches and lowering then no action is required. However, the note makes clear that if the cause of the degradation will continue, power should be lowered
DISTRACTOR (B)	**Cooling Tower Blowdown flow lowers, Yes is wrong:** Cooling Tower Blowdown flow lowers" is plausible because CT blowdown is effected in the event of a Circ water pump; however, this is the opposite of the correct response: A tripped pump will result in a higher CT basin level and therefore more blowdown flow which is gravity fed. The second part is correct..
DISTRACTOR (C)	**Cooling Tower Blowdown flow rises, No is wrong:** The first part of the answer is correct. It is plausible that No action is required if the candidate evaluates the current vacuum and determines that no action is required because it is above the alarm setpoint. However, the note makes clear that if the cause of the degradation will continue, power should be lowered.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 56 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	6
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496003
Version ID:	3185811
User-Defined ID:	Q #56 NEW
Cross Reference Number:	CLOSED
Topic:	Circulating Water Pump Trip Impact on CT Basin Level and Condenser Vacuum
Num Field 1:	LM
Num Field 2:	RO-high
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	This question is RO knowledge level as the answer is based on the NOTE contained in step 3.0 Note 1 directing power to be lowered. Procedure Notes are part of RO required knowledge

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	510001 A2.01 3.5
KA Statement	Ability to (a) predict the impacts of the following on the (SF8 CWS*) CIRCULATING WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations:Pump/Motor failure
Cognitive level	High
Safety Function	8
10 CFR 55	41.5
Technical Reference with Revision No:	ARC-MCR-104-E5 rev.006 OT-116 Rev.046
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0009.04

57 **ID: 2495505** **Points: 1.00**

Unit 1 is in day 5 of a refueling outage with the following conditions:

- Reactor Enclosure Secondary Containment is extended to include the common Refuel Floor when the following occurs:

An irradiated fuel bundle is dropped on the core resulting in the following radiation levels:

- RISH-26-1K610A, REFUEL FLOOR VENTILATION MON: 1.79 mR/hr
- RISH-26-1K610B, REFUEL FLOOR VENTILATION MON: 1.48 mR/hr
- RISH-26-1K610C, REFUEL FLOOR VENTILATION MON: 2.38 mR/hr
- RISH-26-1K610D, REFUEL FLOOR VENTILATION MON: 2.44 mR/hr

WHICH ONE of the following identifies the expected status of the Reactor Enclosure for the above conditions?

	A Channel Reactor Enclosure Isolation Signal	B Channel Reactor Enclosure Isolation Signal
A.	INITIATED	INITIATED
B.	INITIATED	NOT INITIATED
C.	NOT INITIATED	INITIATED
D.	NOT INITIATED	NOT INITIATED

Answer: C

Answer Explanation

Reactor Enclosure isolation logic is as follows:

- A and B instruments input to the A isolation logic
- C and D instruments input to the B isolation logic

From the stem the candidate determines that C and D Refuel Process Radiation Monitor readings are above the isolation set point of 2.0 mR/hr, this coupled with Reactor Enclosure Secondary Containment being extended to include the common Refuel Floor result in the B Channel Reactor Enclosure Isolation signal being initiated.

Distractors that in include A Channel Reactor Enclosure Isolation signal being initiated are wrong but plausible as the values given for monitors are above the isolation setpoints for the corresponding reactor enclosure monitors
From LGSOPS0076 Lesson Plan:

REFUEL FLOOR ISOLATION SIGNALS			
SIGNAL	DIVISION 1	DIVISION 2	SETPOINT
Low zone DP	A Inst.	B Inst.	- 0.1"WG for 100 seconds (still a vacuum, but not enough vacuum
SGTS damper open	HV76-019	HV76-020	Not fully closed
MANUAL	HS76-*80A	HS76-*80B	Arm & Depress
EXH. HI RAD	A & B	C and D	2.0mR/Hr
Other unit RF logic	Other Unit Div 1	Other Unit Div 2	Any Trip
RE Isolation	Any Div 1 Isol	Any Div 2 Isol	*

ANSWER (C)	**NOT INITIATED, INITIATED; Correct:** A and B rad readings do not exceed the setpoint, therefore no A channel isolation occurs C and D rad readings exceed the setpoint and this results in a B Channel isolation.
DISTRACTOR (A)	**INITIATED, INITIATED; Wrong:** The first part of the answer option would be correct if all 4 channels had exceeded the setpoint, A and B do not as noted above. The second part is correct for the existing stem conditions.
DISTRACTOR (B)	**INITIATED, NOT INITIATED; Wrong:** Plausible answer option if a candidate reverses the logic and applies C and D channel to A isolation system. CREFAS uses C and D rad signals for fan initiatiation. As noted above however, this is incorrect.
DISTRACTOR (D)	**NOT INITIATED, NOT INITIATED; Wrong:** Plausible to the candidate who applies standard logic arrangement of A or C AND B or D. In that configuration, both systems would see an isolation. As it is, the A channel does not have an initiation

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 57 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495505
Version ID:	3194282
User-Defined ID:	Q #57 NEW
Cross Reference Number:	CLOSED
Topic:	PCIV Response to Process Rad Monitor Spikes
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	295033 EK2.02 3.5
KA Statement	Knowledge of the relationship between the (EPE 10) HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following systems or components: Process Radiation Monitoring System
Cognitive level	High
Safety Function	9 - Radioactivity Release
10 CFR 55	41.8
Technical Reference with Revision No:	S76.9.A Rev 023 ARC-MCR-109 E2 Rev 003
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0076A 11

58 **ID: 2495997** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- 30 scfm Offgas effluent flow
- Offgas dew point monitor is reading 40°F

The Charcoal Vault Refrigeration Compressors trip and cannot be restarted.

WHICH ONE of the following identifies the change in the activity of the Offgas effluent, if any, and the monitoring location?

	Change in Activity	Monitoring Location
A.	Remains the same	South Stack
B.	Remains the same	North Stack
C.	Rises	South Stack
D.	Rises	North Stack

Answer: D

Answer Explanation
The charcoal delays gaseous xenon, krypton, and their daughter products along with biologically significant isotopes Sr-89, Sr-90, Ba-140 and Cs-137 in the Offgas stream through adsorption. This allows the radioactive isotopes to decay to levels acceptable for release to the atmosphere.

ANSWER (D)	**Rises, North Stack is correct:** With the refrigeration system out of service, Offgas temperatures will rise which will cause higher dewpoints and reduced efficiency in adsorption of the charcoal. The increased flow will result higher release rates. The Offgas system is aligned to the North Stack and those rad monitors will indicate the difference.
DISTRACTOR (A)	**Remains the same, South Stack is wrong:** The first part of the answer option would be correct for a normal dew point. The second part is plausible because normal plant exhaust for the Reactor enclosure is through the South Stack.
DISTRACTOR (B)	**Remains the same, North Stack is wrong:** The first part of the answer option would be correct for a normal dew point. The second part is correct.
DISTRACTOR (C)	**Rises, South Stack is wrong:** The first part of the answer option is correct. The second part is plausible because normal plant exhaust for the Reactor enclosure is through the South Stack

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 58 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	2.50
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495997
Version ID:	3185647
User-Defined ID:	Q #58 BANK
Cross Reference Number:	CLOSED
Topic:	Offgas condenser temps dew point
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	2
KA # and Rating	271000 A1.11 2.6
KA Statement	Ability to predict and/or monitor changes in parameters associated with operation of the (SF9 OG) OFFGAS SYSTEM including: Offgas condenser temperatures
Cognitive level	High
Safety Function	9
10 CFR 55	41.5
Technical Reference with Revision No:	M-0079 sheet 2 Rev.001
Question History: (i.e. LGS NRC-05)	NRC 2017
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0069.06

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

59 **ID: 2495691** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor startup in progress
- ST-6-107-884-1, Neutron Monitoring System Overlap Verification on Startup, has been completed
- Source Range Monitor (SRM) detectors are being withdrawn from the core with the following Intermediate Range Monitor (IRM) System conditions:

IRM	Range
A	2
B	2
C	Channel is bypassed
D	3
E	3
F	4
G	3
H	4

While being withdrawn, the indication for the "1D" SRM Channel drops to 30 CPS.

WHICH ONE of the following identifies the status of the "SRM Retracted When Not Permitted" Annunciator and the Control Rod Withdrawal Block?

	SRM Retracted When Not Permitted	Control Rod Withdrawal Block
A.	Lit	Active
B.	Lit	Not Active
C.	Not Lit	Active
D.	Not Lit	Not Active

Answer: A

Answer Explanation
Per ARC-MCR-107, REACTOR, I4, "SRM RETRACTED WHEN NOT PERMITTED," this alarm will be received and a control rod withdrawal block signal will be generated if an attempt is made to retract any SRM detector while it is indicating less than 100 CPS **AND** any associated IRM Channel Range Switches are below Range 3.

ANSWER (A)	**Lit, Active; Correct,** 1D SRM has failed downscale to less than 100 cps and the 1B IRM is on range 2, therefore the alarm is lit and the rod block is active
DISTRACTOR (B)	**Lit, Not Active; Wrong,** Plausible misconception that SRM Retract Permit becomes active when SRM level is <100 CPS. Incorrect because the 1B IRM is on range 2, therefore the alarm is lit and the rod block is active
DISTRACTOR (C)	**Not Lit, Active; Wrong,** The first part of the answer option would be correct if the SRM count rate were greater than 100 cps in the question stem. Also plausible due to possible misconception that the SRM downscale alarm of 3 cps is the value at which the SRM Retract Permit becomes active and that the Rod block occurs with SRM counts below 100 cps The second part is correct: A rod block occurs when an attempt is made to retract any SRM detector while it is indicating less than 100 CPS AND any associated IRM Channel Range Switches are below Range 3.
DISTRACTOR (D)	**Not Lit, Not Active;** Wrong, The first and second parts of the answer option would be correct if the SRM count rate were greater than 100 cps or the 1B IRM were above range 2. Incorrect because the 1B IRM is on range 2 and the SRM is below 100 cps, therefore the alarm is lit and the rod block is active.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 59 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495691
Version ID:	3185812
User-Defined ID:	Q #59 NEW
Cross Reference Number:	CLOSED
Topic:	SRM D/S Rod Block
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	NONE
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	215004 K3.02 3.5
KA Statement	Source Range Monitor: Knowledge of the effect that a loss or malfunction of the (SF7 SRMS) SOURCE RANGE MONITOR SYSTEM will have on the following systems or system parameters: RMCS
Cognitive level	High
Safety Function	7 - Instrumentation
10 CFR 55	41.7
Technical Reference with Revision No:	ARC-MCR-107 I4 Rev.001 GEK-13962I, Detector Insert and Retract Mechanism Operation
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0074.06

60 **ID: 2495681** **Points: 1.00**

Unit 1 is in OPCON 1 with the following conditions:

- 1B SLC pump is deenergized and blocked for repair
- Division II D.C. has experienced a fault and is deenergized
- A feedwater transient caused reactor water level to drop to +5 inches before being restored to + 35 inches
- All RO SCRAM actions have been completed per OT-200 Appendix # 1
- 1 min. later, Reactor power remains at 100%

WHICH ONE of the following identifies the status of RWCU System isolation valves 3 minutes later?

	INBOARD ISOLATION VALVE HV-44-1F001	OUTBOARD ISOLATION VALVE HV-44-1F004
A.	Closed	Closed
B.	Closed	Open
C.	Open	Closed
D.	Open	Open

Answer: B

Answer Explanation	
ANSWER (B)	**Closed, Open is correct:** Although DIV 1 RRCS normally closes both RWCU isol valves, it does so through the SLC pump logic. With the B SLC pump deenergized, the outboard valve will not close.
DISTRACTOR (A)	**Closed, Closed is wrong:** Plausible answer because either RRCS division is capable of closing both SLC isolation valves. But with the loss of DC, the B SLC isolation will not close with the pump de-energized.
DISTRACTOR (C)	**Open, Closed is wrong:** Plausible selection to the candidate who reverses Div 1 and Div 2 valve assignments. Incorrect because with the B SLC pump deenergized, the outboard valve will not close but the inboard valve will close.
DISTRACTOR (D)	**Open, Open is wrong:** Plausible misconception that without Div II DC, Div II RRCS is INOP and both divisions of RRCS are required to close either RWCU isolation valve in a two out of two logic. Incorrect because with the B SLC pump deenergized, the outboard valve will not close, but the inboard valve will close

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 60 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495681
Version ID:	3185650
User-Defined ID:	Q #60 BANK
Cross Reference Number:	CLOSED
Topic:	SLC RWCU isolation
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	211000 A4.06 4.0
KA Statement	Standby Liquid Control System: Ability to manually operate and/or monitor in the control room: RWCU system isolation
Cognitive level	High
Safety Function	1
10 CFR 55	41.7
Technical Reference with Revision No:	GP-8 Rev.020
Question History: (i.e. LGS NRC-05)	NRC 2017 January
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0044

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

61 **ID: 2507300** **Points: 1.00**

Unit 2 plant conditions are as follows:

- Reactor is Shutdown
- Two (2) loops of Suppression Pool Cooling are in service with the following indications:
  - "2A" RHR loop flow 7000 gpm
  - "2B" RHR loop flow 9000 gpm
  - Suppression Pool temperature is 94 °F and lowering

WHICH ONE of the following describes the preferred RHR loop flowrate per S51.8.A, "Suppression Pool Cooling Operation and Level Control", and reason for those actions?

A. Raise "2A" RHR flow to greater than 7500 gpm to reduce cavitation across the "2A" RHR Pump

B. Raise "2A" RHR flow to greater than 7500 gpm to prevent Condensate Transfer from entering the Suppression Pool

C. Reduce "2B" RHR flow to less than 8500 gpm to reduce cavitation across HV-51-2F024B, "2B" RHR Test Return Valve

D. Reduce "2B" RHR flow to less than 8500 gpm to prevent Condensate Transfer from entering the Suppression Pool

Answer: D

Answer Explanation

ANSWER (D)	**Reduce "2B" RHR flow to less than 8500 gpm to prevent Condensate Transfer from entering the Suppression Pool is correct:** S51.8.A U/2 directs throttling flow on the inservice RHR loop to achieve a flow rate between 8000 gpm and 8500 gpm. The reason listed in the NOTE on page 7 of S51.8.A is as follows: 1. Flow rate is throttled to less than 8500 gpm to prevent condensate transfer from entering Suppression Pool. At higher flow rates, the discharge pressure of the pump drops as it approaches runout to less than the shutoff head of condensate transfer (~125#)
DISTRACTOR (A)	**Raise "2A" RHR flow to greater than 7500 gpm to prevent Condensate Transfer from entering the Suppression Pool is wrong:** This is plausible to the candidate who incorrectly recalls that flow in the system is set to <8500 to prevent Condensate Transfer flow into the Pool and associates that with low flow. As noted above, high flow (>8500 gpm) / low discharge pressure will cause condensate transfer to flow into the pool
DISTRACTOR (B)	**Raise "2A" RHR flow to greater than 7500 gpm to reduce cavitation across the "2A" RHR Pump is wrong:** Plausible answer to the candidate who recalled that flow must be maintained high enough to prevent cavitation or damage of the 24A valve and incorrectly recalled that flow limit as greater than (>)7500. The actual limit is 8000 to 8500 gpm.
DISTRACTOR (C)	**Reduce "2B" RHR flow to less than 8500 gpm to reduce cavitation across HV-51-2F024B, "2B" RHR Test Return Valve is wrong:** Plausible answer to the candidate who recalls that the flow limit is 8500 gpm but cannot recall the answer thinking cavitation is the answer. The actual reason is Condensate Transfer.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 61 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507300
Version ID:	3194692
User-Defined ID:	Q #61 NEW
Cross Reference Number:	CLOSED
Topic:	SP Cooling Flow Limit
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question meets the K/A of operating the Suppression Pool cooling system to maximize flow and still meet the operational requirements of the RHR system. The SP temperature is elevated and 2 loops of pool cooling are required to lower temperature expeditiously.
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	2
KA # and Rating	295013 AA1.01 4.3
KA Statement	Ability to operate or monitor the following as they apply to (APE 13) HIGH SUPPRESSION POOL TEMPERATURE.:Suppression pool Cooling
Cognitive level	Low
Safety Function	3
10 CFR 55	41.5
Technical Reference with Revision No:	S51.8.A U/2 Rev.000
Question History: (i.e. LGS NRC-05)	Bank 561334
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS1550.03

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

62 **ID: 2495832** **Points: 1.00**

Unit 2 is operating at 100% power.

The running 2B TECW pump trips and the standby pump fails to start.

WHICH ONE of the following is the expected plant/system response?

A. Isophase Bus cooler high temperature

B. Main Turbine Lube Oil from cooler high temperature

C. Stator Cooling return high temperature

D. Service Air Compressor aftercooler high temperature

Answer: D

Answer Explanation

ANSWER	**Service Air Compressor aftercooler high temperature:** The Service Air Compressors are cooled by TECW as are the Instrument Air compressors. A loss of TECW will result in a Hi Temp condition of a running compressor in under one minute.
DISTRACTOR	**Isophase Bus cooler high temperature:** Wrong, plausible to the examinee who incorrectly concludes that systems/components associated with the Main Turbine/Generator (in the Turbine Enclosure) must use TECW as their source of cooling. It uses service water.
DISTRACTOR	**Main Turbine Lube Oil from cooler high temperature:** Wrong, plausible to the examinee who incorrectly concludes that systems/components associated with the Main Turbine/Generator (in the Turbine Enclosure) must use TECW as their source of cooling. It uses service water
DISTRACTOR	**Stator Cooling return high temperature:** Wrong, plausible to the examinee who incorrectly concludes that systems/components associated with the Main Turbine/Generator (in the Turbine Enclosure) must use TECW as their source of cooling. It uses service water

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 62 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495832
Version ID:	3185671
User-Defined ID:	Q #62 BANK
Cross Reference Number:	CLOSED
Topic:	Inst. Air/Service Air Loss of CCW
Num Field 1:	LM
Num Field 2:	RO-LOW
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	This answer to this question is service air aftercoolers. While the specific KA is Instrument Air (IA) and the impact of loss of CCW on IA, Service air is a subsystem of instrument air and its direct backup. The loss of CCW posited here has the exact same effect on the IA compressors and using SA compressor adds some level of difficulty for the candidate.
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	300000 K6.14 3.1
KA Statement	Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF8 IA) INSTRUMENT AIR SYSTEM: Component cooling water system
Cognitive level	Low
Safety Function	8
10 CFR 55	41.7
Technical Reference with Revision No:	ON-117 Rev.010
Question History: (i.e. LGS NRC-05)	NRC 2017
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0014.03

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

63 **ID: 2500131** **Points: 1.00**

With regards to RCIC operation:

1) What component is designed to prevent an overspeed trip of RCIC during an automatic startup

AND

2) How is RCIC shutdown to prevent overspeed on a subsequent startup?

	1.	2.
A.	RCIC Ramp Generator	Close HV-50-*F045, RCIC Steam Supply Inlet Valve
B.	RCIC Ramp Generator	Close and Re-open HV-50-*12, RCIC Trip Throttle Valve
C.	FIC-49-*R600, RCIC Flow Controller	Close HV-50-*F045, RCIC Steam Supply Inlet Valve
D.	FIC-49-*R600, RCIC Flow Controller	Close and Re-open HV-50-*12, RCIC Trip Throttle Valve

Answer: A

Answer Explanation

ANSWER (A)	**RCIC Ramp Generator, Close HV-50-*F045, RCIC Steam Supply Inlet Valve is correct:** The ramp generator is designed to provide a controlled acceleration signal for the RCIC turbine on startup. By limiting the acceleration rate, the chances of overspeed are greatly reduced. When RCIC is secured, the operator will manually close the HV-50-*F045, Steam admission valve. This resets the ramp generator so that it will start the ramp on a subsequent startup.
DISTRACTOR (B)	**RCIC Ramp Generator, Close and Re-open HV-50-*12, RCIC Trip Throttle Valve is wrong:** The first part of the answer option is correct. Cycling the HV-50-112 is a plausible action for reset as this is the action required to reset the Trip throttle valve following a turbine trip. However, this action would not reset the ramp generator
DISTRACTOR (C)	**FIC-49-*R600, RCIC Flow Controller, Close HV-50-*F045, RCIC Steam Supply Inlet Valve is wrong:** Plausible response to this question as the RCIC flow controller will control the speed of the RCIC turbine during normal operation **AFTER** the ramp generator has "ramped". However, it will have no impact on limiting the likelihood of overspeed on startup.The second part of the answer option is correct
DISTRACTOR (D)	**FIC-49-*R600, RCIC Flow Controller, Close and Re-open HV-50-*12, RCIC Trip Throttle Valve is wrong:** Plausible response to this question as the RCIC flow controller is will control the speed of the RCIC turbine during normal operation **AFTER** the ramp generator has "ramped". However, it will have no impact on limiting the likelihood of overspeed on startup. Cycling the HV-50-112 is a plausible action for reset as this is the action required to reset the Trip throttle valve following a turbine trip. However, this action would not reset the ramp generator

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 63 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2500131
Version ID:	3194473
User-Defined ID:	Q #63 NEW
Cross Reference Number:	CLOSED
Topic:	RCIC Turbine Startup
Num Field 1:	LM
Num Field 2:	RO Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data		
Level	RO	
Tier	2	
Group	1	
KA # and Rating	217000 A3.02 4.0	
KA Statement	Ability to monitor automatic operation of the (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM including: Turbine startup	
Cognitive level	Low	
Safety Function	2	
10 CFR 55	41.7	
Technical Reference with Revision No:	S49.1.D S49.1.C	Rev.045 Rev.017
Question History: (i.e. LGS NRC-05)	New	
Question Type: (New, Bank, Modified)	New	
Revision History:		
Training Objective	LGSOPS0049.06	

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

64 **ID: 2496049** **Points: 1.00**

A fully withdrawn Unit 1 control rod that is subsequently inserted three-fourths of the way into the core will be displayed as _____1_____ on the 4 rod display and represents a rod travel of ____2_____ feet into the core.

A. 1) 12
2) 3

B. 1) 12
2) 9

C. 1) 36
2) 3

D. 1) 36
2) 9

Answer: B

Answer Explanation

ANSWER (B)	**12, 9 is correct:** The Limerick control rods are 12 feet in length. As the CRDM moves from full in to fully withdrawn, the CRDM moves past reed switches placed 3 inches apart. Control rods can be placed at any of 24 notch positions which correspond to even reed switches with 00 being fully inserted to 48 being fully withdrawn. When the rod is withdrawn, it is at position 48. Inserting the control rod 3/4 of the distance means that the rod is inserted to position 12 and that equates to 12 feet X .75 or 9 feet inserted
DISTRACTOR (A)	**12, 3 is wrong:** The first part of the answer option is correct 3 is a plausible selection if the candidate uses the final position in the core (3 feet withdrawn) rather than the total travel.
DISTRACTOR (C)	**36, 3 is wrong:** The first part of the answer option is plausible if the candidate selects the total reed switches passed rather than the displayed position. The second part of the answer option is a plausible selection (**3**) if the candidate uses the final position in the core (3 feet withdrawn) rather than the total travel.
DISTRACTOR (D)	**36, 9 is wrong:** 36 is a plausible choice if the candidate selects the total reed switches passed rather than the displayed position. 2nd part is correct

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 64 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496049
Version ID:	3185813
User-Defined ID:	Q #64 BANK
Cross Reference Number:	CLOSED
Topic:	RPIS CRD CRDM Travel
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	4
Group	N/A
KA # and Rating	292005 K1.01 3.3
KA Statement	CONTROL RODS: Relate notch and rod position
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.1
Technical Reference with Revision No:	LGSOPS0073A Rev.004 L-S-037 Rev.003
Question History: (i.e. LGS NRC-05)	Bank
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0073A..02H

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

65 **ID: 2495390** **Points: 1.00**

Unit 1 was manually scrammed due to a leak in the Suppression Pool with the following conditions:

- Suppression Pool level is 16 ft, steady
- RCIC is being used for RPV level control and is injecting at rated flow
- HPCI is being used for RPV pressure control with a flow rate of 4,000 GPM

WHICH ONE of the following describes the required action and the reason for this action?

	Required Action	Reason for Action
A.	RCIC must be secured	Due to exceeding Vortex Limits
B.	RCIC must be secured	To prevent direct pressurization of the suppression chamber
C.	HPCI must be secured	Due to exceeding Vortex Limits
D.	HPCI must be secured	To prevent direct pressurization of the suppression chamber

Answer: D

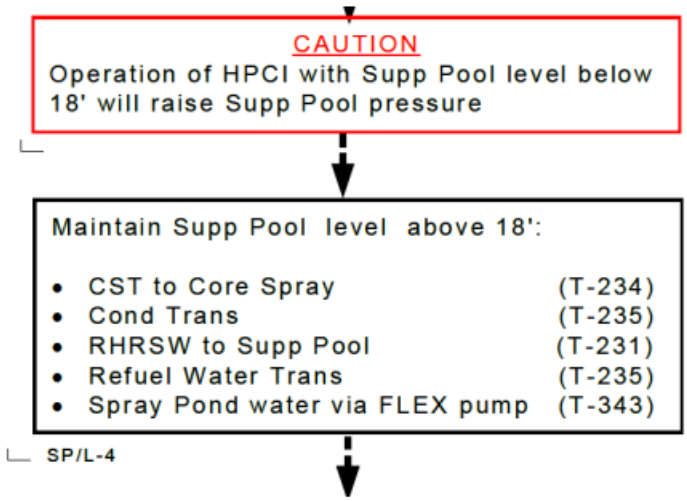
Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

The examinee identifies that RCIC is being used for core cooling (HPCI is not being used for core cooling) and the examinee recalls from T-102 SP/L-5, which states that "If Suppression Pool level cannot be maintained above 18 ft AND HPCI is not required from RPV injection, THEN secure HPCI."

From T-102 Bases:



DISCUSSION

An inline caution in the "LOW" SP/L flowpath is included as a reminder of the elevation of th HPCI turbine exhaust line discharge level in the suppression pool and the impact of HPCI operation with suppression pool level below this level. Operation of the HPCI turbine with its exhaust unsubmerged will tend to directly pressurize the suppression chamber, potentially challenging primary containment pressure limits. If suppression pool water level cannot be maintained above the elevation of the top of the HPCI exhaust, HPCI operation should therefore be avoided. However, if HPCI is needed for core cooling, operation is permitted e with the turbine exhaust uncovered since:

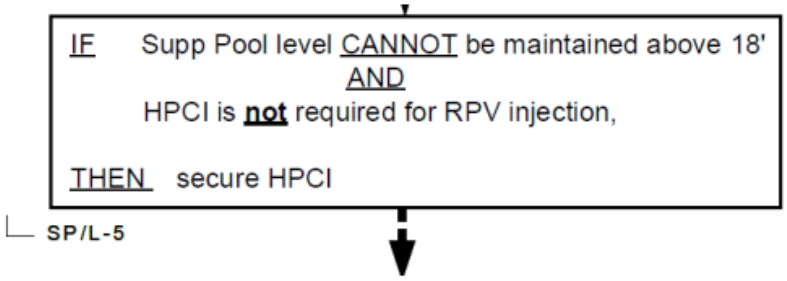
- Loss of adequate core cooling may lead to even greater containment challenges and increase any resulting radioactivity release.
- If suppression pool water level cannot be maintained above the elevation of the HPC exhaust, containment integrity is likely already impaired.
- It is expected that any containment pressurization resulting from HPCI operation wou not result in catastrophic rupture of the containment shell, compromise RPV injection capability or jeopardize core cooling.

Core cooling is thus prioritized over other TRIP objectives.

The caution is not applicable to RCIC operation since the RCIC turbine exhaust flowrate is much smaller.

Step SP/L-4 directs actions to maintain suppression pool level above the elevation of the H turbine exhaust (18').

When suppression pool level drops below 18', any further reduction in level could result in pressurizing the suppression chamber, potentially challenging primary containment pressur limits. Suppression pool level should, therefore, be maintained above 18'.



DISCUSSION

Operation of the HPCI turbine with its exhaust unsubmerged will tend to directly pressuriz suppression chamber. If suppression pool water level cannot be maintained above the elevation of the top of the HPCI exhaust, HPCI is therefore secured if not needed for core cooling.

Therefore, HPCI is secured because core cooling is assured.

ANSWER (D)	**HPCI must be secured; To prevent direct pressurization of the suppression chamber**: Correct, as described above
DISTRACTOR (A)	**RCIC must be secured; Due to exceeding Vortex Limits**: Wrong, RCIC remains on the safe side of the RCIC Vortex Limit curve found on T-102 Sheet 2. Plausible to the examinee that fails to correctly recall the RCIC Vortex limits
DISTRACTOR (B)	**RCIC must be secured; To prevent direct pressurization of the suppression chamber**: Wrong, The first part of the answer option is plausible because the RCIC exhaust is above suppression pool level as described in T-102 Bases for the caution above step SP/L-4, "the caution is not applicable to RCIC operation since the RCIC turbine exhaust flowrate is much smaller. Incorrect because HPCI must be secured
DISTRACTOR (C)	**HPCI must be secured; Due to exceeding Vortex Limits**: Wrong, The first part of the answer option is correct, but the second part is incorrect. HPCI remains on the safe side of the HPCI Vortex Limit curve found on T-102 Sheet 2. Plausible to the examinee that fails to correctly recall the HPCI Vortex limits.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 65 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495390
Version ID:	3185674
User-Defined ID:	Q #65 BANK
Cross Reference Number:	CLOSED
Topic:	Suppression Pool Low Level - HPCI S/D
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295030 EK3.02 4.0
KA Statement	**EPE: 295030 Low Suppression Pool Water Level:** Knowledge of the reasons for the following responses or actions as they apply to (EPE 7) LOW SUPPRESSION POOL WATER LEVEL: HPCI Shutdown
Cognitive level	High
Safety Function	5 - Containment Integrity
10 CFR 55	41.5
Technical Reference with Revision No:	T-102 Rev 028 T-102 Bases Rev 029
Question History: (i.e. LGS NRC-05)	2019 NRC
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS1560 3

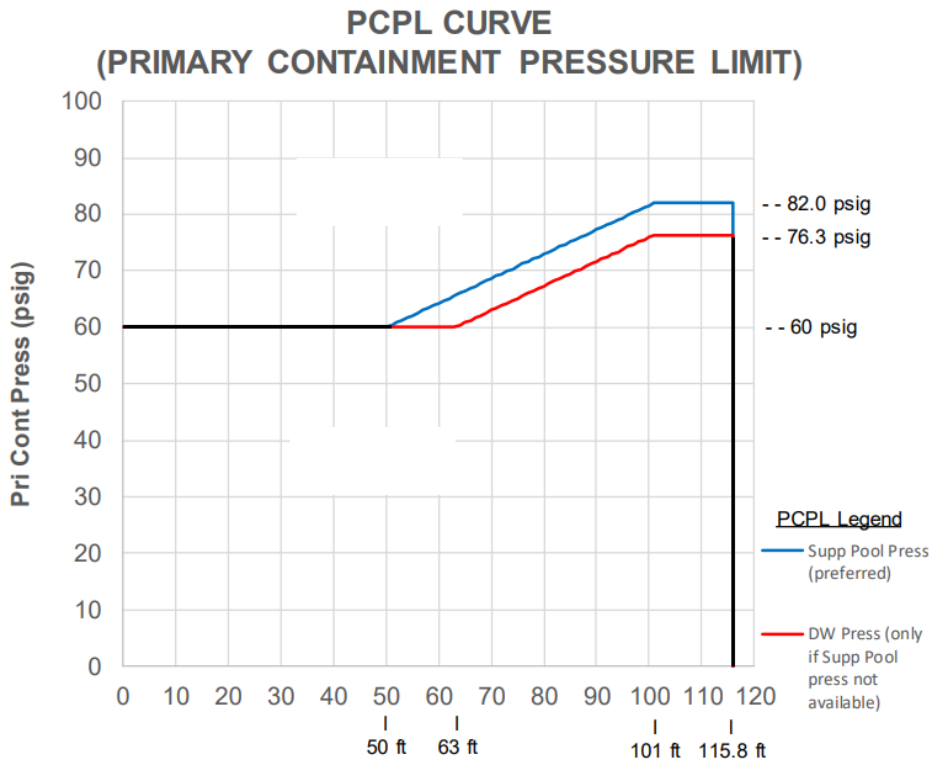
66 **ID: 2495353** **Points: 1.00**

Unit 1 plant conditions:

- Reactor is shutdown
- LOCA in progress

External makeup has been occurring for several days

- Suppression Pool Level indicates 49 feet
- Drywell Pressure indicates 63 psig on PR57-101
- Suppression Pool Pressure indicates 75 psig on PR57-101



CONTAINMENT LEVEL IN FEET

	_____	PSIG SUPP POOL PRESS ON PR57-*01 (BLUE PEN)
MINUS (-)	_____	PSIG PRI CONT PRESS ON PR57-*01 (RED PEN)
EQUALS (=)	_____	△ PSIG
TIMES (X)	2.3	FT/PSIG
EQUALS (=)	_____	FT
PLUS (+)	48.0	FT
EQUALS (=)	_____	FT CONTAINMENT LEVEL

1.) Determine if Primary Containment Pressure is currently on the safe or unsafe side of the PCPL curve and
2.) Select the basis for the PCPL curve

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

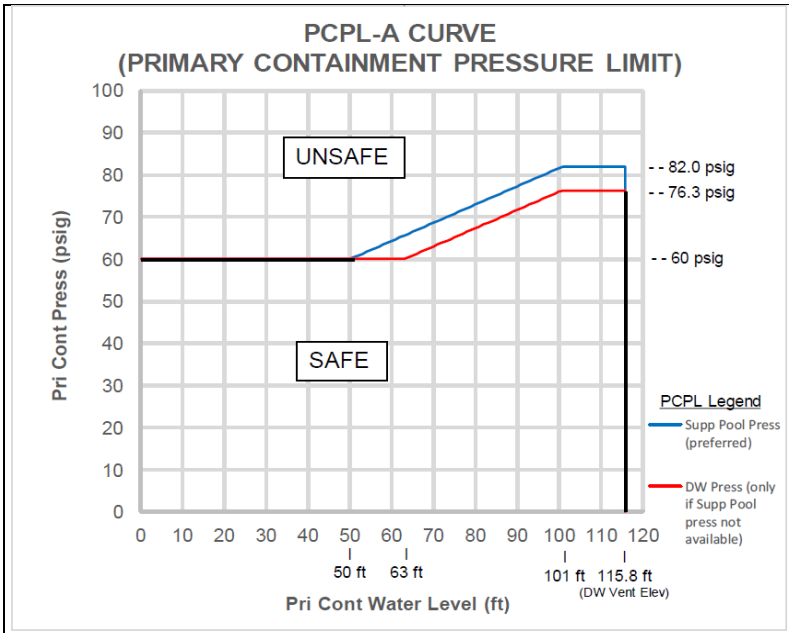
	1.	2.
A.	Safe	Maintain primary containment vent and RPV vent operability
B.	Safe	Prevent exceeding the allowable stresses in the SRV tailpipe, supports and quencher when an SRV is operated
C.	Unsafe	Maintain primary containment vent and RPV vent operability
D.	Unsafe	Prevent exceeding the allowable stresses in the SRV tailpipe, supports and quencher when an SRV is operated

Answer: C

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation



CONTAINMENT LEVEL IN FEET

	_____	PSIG SUPP POOL PRESS ON PR57-*01 (BLUE PEN)
MINUS (-)	_____	PSIG PRI CONT PRESS ON PR57-*01 (RED PEN)
EQUALS (=)	_____	△ PSIG
TIMES (X)	2.3	FT/PSIG
EQUALS (=)	_____	FT
PLUS (+)	48.0	FT
EQUALS (=)	_____	FT CONTAINMENT LEVEL

ANSWER (C)	**Unsafe, Maintain primary containment vent and RPV vent operability; Correct:** Containment level above 48 feet is above the reference tap for the level transmitter for suppression pool level. As water level, rises above that elevation level is calculated based on the differential pressure between the Drywell and the Suppression pool. That formula is included in the embedded reference. using the formula of Supp. Pool pressure - Drywell press X 2.3 ft/psig + 48 ft. gives us [(75-63) X 2.3] + 48 ft.= 75.6 ft. When this is plotted on the PCPL curve (75 psig pri. cont. press and 75.6 ft, we are on the **unsafe** portion of the curve. The purpose of the curve is to ensure that PC integrity is maintained by maintaining venting capability.
DISTRACTOR (A)	**Safe, Maintain primary containment vent and RPV vent operability, Wrong:** Plausible to the candidate who calculates the containment level but mis plots the point on the graph. The blue line is the limiting curve (SP pressure) and the plotted point is clearly above and to the left (UnSafe) 2nd part is correct
DISTRACTOR (B)	**Safe. Prevent exceeding the allowable stresses in the SRV tailpipe, supports and quencher when an SRV is operated; Wrong:** Plausible to the candidate who calculates the containment level but misplots the point on the graph. The blue line is the limiting curve (SP pressure) and the plotted point is clearly above and to the left (UnSafe). Plausible because one of the PCPL bases is less than the max primary containment pressure to operate SRVs. Pressure too high

	would have the SRVs close too soon. Incorrect, however, because “Exceeding allowable stresses in the tailpipe, supports and quencher when an SRV is operated” is a function of the SRV Tail Pipe Level Limit" STPLL.
DISTRACTOR (D)	**Unsafe, Prevent exceeding the allowable stresses in the SRV tailpipe, supports and quencher when an SRV is operated, Wrong:** The first part is correct. The second part is Plausible to the candidate who recalls that one of the PCPL bases is less than the max primary containment pressure to operate SRVs. Pressure too high would have the SRVs close too soon. However, this is not the same as "Exceeding allowable stresses in the tailpipe etc.." That is a function of the SRV Tail Pipe Level Limit" STPLL

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 66 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495353
Version ID:	3185677
User-Defined ID:	Q #66 NEW
Cross Reference Number:	OPEN EMBEDDED
Topic:	High Containment Pressure Integrity
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	ILT

Comments:

References Provided	Embedded Picture -PCPL curve
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295024 EK1.01 4.3
KA Statement	HIGH DRYWELL PRESSURE, High Suppression Pool Water Level: Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 1) HIGH DRYWELL PRESSURE: Drywell Integrity
Cognitive level	High
Safety Function	5 - Containment Integrity
10 CFR 55	41.5/41.7
Technical Reference with Revision No:	T-102 rev. 028 T-102 Bases rev. 029
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1560.02C

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

67 **ID: 2495669** **Points: 1.00**

Unit 2 has experienced a loss of feed.

Reactor water level is -45 inches down slowly.

HPCI Aux Oil Pump has a motor overload warning light lit on the 20C647 panel

Where must an EO respond to attempt to reset the motor overload?

A. 2PPB1

B. 2DB-1

C. 2PPD1

D. 2DA

Answer: B

Answer Explanation

ANSWER (B)	**2DB-1 is correct:** The Unit 2 HPCI AOP is powered from 2DB-1 which is a safeguard 250 VDC load center. It powers multiple HPCI loads
DISTRACTOR (A)	**2PPB1 is wrong:** This is a plausible distractor as the bus is also powered from Div 2 DC and powers a number of HPCI related circuits. However, this is a 125 VDC bus, not a 250 VDC bus.
DISTRACTOR (C)	**2PPD1 is wrong:** Plausible distractor because several HPCI circuits are powered from this Div 4 DC bus which is also 125 VDC
DISTRACTOR (D)	**2DA is wrong:** Plausible answer because this is a 250 VDC Safeguard supply which a candidate could select based on the voltage and the other loads supplied such as RCIC and RPS Inverter.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 67 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495669
Version ID:	3194696
User-Defined ID:	Q #67 NEW
Cross Reference Number:	CLOSED
Topic:	HPCI AOP PS.
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	206000 K2.02 3.2
KA Statement	HIGH PRESSURE COOLANT INJECTION SYSTEM Knowledge of electrical power supplies to the following: Pumps
Cognitive level	High
Safety Function	4
10 CFR 55	41.7
Technical Reference with Revision No:	E-0033 sht.2 Rev.050
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0055.02

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

68 **ID: 2496033** **Points: 1.00**

Limerick Unit 2 is performing a startup after a refueling outage.

GP-2 Appendix 1, Rx Startup is in progress

1) When is the earliest control rod withdrawal limited to single notch withdrawal (between notches 04 and 36) and

2) When may single notch withdrawal be discontinued?

A. 1) When the third count rate doubling (3 doublings) is reached and
2) When the IRMs are on range 7 and IRM/APRM overlap verified

B. 1) When the third count rate doubling (3 doublings) is reached and
2) When the reactor is critical with one Turbine Bypass Valve partially open

C. 1) When the second count rate doubling (2 doublings) is reached and
2) When the IRMs are on range 7 and IRM/APRM overlap verified

D. 1) When the second count rate doubling (2 doublings) is reached and
2) When the reactor is critical with one Turbine Bypass Valve partially open

Answer: B

Answer Explanation

3.2.14 **WHEN** SRM count rates on at least 2 SRMs reach three doublings (8 x initial count rate) from step 3.2.10,
THEN PERFORM the following:

4. **PERFORM** control rod withdrawal via single notch motion between notches 04 to 36
OR as recommended by Reactor Engineering, in addition to RWM requirements until the reactor is critical
AND one turbine bypass valve is partially open.

ANSWER (B)	**1) When the third count rate doubling (3 doublings) is reached and 2) When the reactor is critical with one Turbine Bypass Valve partially open is correct:** During a startup as noted above, when 3 doublings are reached, single rod notching is required, and it is continued until the reactor is critical and one TBV is partially open
DISTRACTOR (A)	**1) When the third count rate doubling (3 doublings) is reached and 2) When the IRMs are on range 7 and IRM/APRM overlap verified is wrong:** The first part is correct**.** IRMs on range 7 is plausible as this is typically where IRM/APRM overlap is recorded however as noted above the actual requirement is open TBV
DISTRACTOR (C)	**1) When the second count rate doubling (2 doublings) is reached and 2) When the IRMs are on range 7 and IRM/APRM overlap verified is wrong:** Plausible that second doubling is the correct limit as this is a more conservative value than 3 doublings. Recent fuel loadins have caused the guidance to be more conservative going from 4 to 3 doublings and OPEX. The second part is plausible because IRMs on range 7 is typically where IRM/APRM overlap is recorded however as noted above the actual requirement is open TBV
DISTRACTOR (D)	**1) When the second count rate doubling (2 doublings) is reached and 2) When the reactor is critical with one Turbine Bypass Valve partially open is wrong:** Plausible that second doubling is the correct limit as this is a more conservative value than 3 doublings. Recent fuel loadins have caused the guidance to be more conservative going from 4 to 3 doublings and OPEX. The second part of the answer option is correct.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 68 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2496033
Version ID:	3196164
User-Defined ID:	Q #68 NEW
Cross Reference Number:	CLOSED
Topic:	Single Notch Requirements
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	3
Group	N/A
KA # and Rating	G 2.2.2 4.6
KA Statement	EQUIPMENT CONTROL Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels
Cognitive level	Low
Safety Function	N/A
10 CFR 55	41.6
Technical Reference with Revision No:	GP-2 App 1 Rev.066
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS2001.02B

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

69 **ID: 2495873** **Points: 1.00**

LGS Units 1 and 2 have experienced a Loss of Offsite Power and both units scram.

- Unit 1 emergency diesel generators have started and are carrying their vital buses with the exception of D12
- All Unit 2 emergency diesel generators are carrying their buses

While the crew is stabilizing the plant, the 0D ESW pump tripped on overcurrent

Consider:

E-10/20, "Loss of Offsite Power" "Attachment 3, 'Alternate Power Supply for Any 4KV Safeguard Bus Using Any Diesel Generator"
S11.6.A, "Transfer C & D ESW Pumps to Alternate Supply

What is the status of the D14 EDG 10 minutes later with no operator intervention and what action should the crew take?

	D14	Action
A.	Tripped on high temperature	Perform E10/20 Att. 3 and start the 0B ESW pump
B.	Tripped on high temperature	Move the 0D ESW breaker to the D14 cubicle per S11.6.A
C.	Continues to run	Perform E10/20 Att. 3 and start the 0B ESW pump
D.	Continues to run	Move the 0D ESW breaker to the D14 cubicle per S11.6.A

Answer: A

Answer Explanation	
ANSWER (A)	**Tripped on high temperature Perform E10/20 Att. 3 and start the 0B ESW pump is correct:** Following a loss of offsite power (LOOP), all EDGs should start and load the 4kv vital buses. ESW pumps A and B are powered from D11 and D12. C and D are from D23 and D24. Any single ESW pump in a loop (A or B) is sufficient to cool all loads. In this scenario, D12 EDG does not start and along with it, 0B ESW. When the 0D ESW pump trips, no flow is available in the B ESW loop and all running EDGs will lose cooling. The loaded Diesels will rapidly heat up and trip on high temperature without cooling. To correct this situation, power must be restored to the 0B ESW pump and the way to do this is by cross tying D12 to an energized bus and then restoring ESW pump operation.
DISTRACTOR (B)	**Tripped on high temperature, Move the 0D ESW breaker to the D14 cubicle per S11.6.A is wrong:** The first part is correct. Plausible 2nd part answer to swap cubicles as it as an option in SE-10/20.step 2.6.7. A candidate could consider that perhaps a different source would eliminate the cause of the ESW trip. This is incorrect however, as a tripped ESW pump either has mechanical or electrical issues causing the overcurrent or could have a breaker problem
DISTRACTOR (C)	**Continues to run, Perform E10/20 Att. 3 and start the 0B ESW pump is wrong:** The first part of the answer option is plausible because the EDG will bypass high temperature trips on a LOCA start and assumes that the same operation occurs on a bus undervoltage start. With high temp trips bypassed, the EDG would continue to run until it broke. In fact, high temperature trips are not bypassed on a low voltage start and the EDG would trip in approximately 5 to 7 minutes depending on the bus loading. The second part is correct
DISTRACTOR (D)	**Continues to run, Move the 0D ESW breaker to the D14 cubicle per S11.6.A is wrong:** The first part of the answer option is plausible because the EDG will bypass high temperature trips on a LOCA start. With high temp trips bypassed, the EDG would continue to run until it broke. In fact, high temperature trips are not bypassed on a low voltage start and the EDG would trip in approximately 5 to 7 minutes depending on the bus loading. Plausible second part answer to swap cubicles as the it is allowed in SE-10/20.step 2.6.7. This is incorrect, however, as a tripped ESW pump could have mechanical or electrical issues causing the overcurrent or could have a breaker problem

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 69 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495873
Version ID:	3185680
User-Defined ID:	Q #69 NEW
Cross Reference Number:	CLOSED
Topic:	LOOP ESW pump trip actions
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires the candidate to predict the impact of an ESW pump trip and determine the correct procedure to perform to mitigate the fault. ESW is a service water system which is specific to the Emergency Diesel Generators and when running will supply several additional important plant safety loads which may lose their normal Service Water Supply when offsite power is lost.
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	510000 A2.01 3.6
KA Statement	Ability to (a) predict the impacts of the following on the (SF4 SWS*) SERVICE WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Pump/motor failure
Cognitive level	High
Safety Function	4
10 CFR 55	41.5
Technical Reference with Revision No:	E-10/20 Rev.060 S11.6.A Rev.009
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0011.03

70 **ID: 2495357** **Points: 1.00**

The Unit 2 reactor has scrammed and the MSIVs have closed due to a small break in the piping from the Main Steam Line Equalizing Header

- SRVs are now being cycled to control reactor pressure between 700 -800 psig
- Suppression Pool level has risen to 32.75 feet.

If Suppression Pool level cannot be restored and maintained below 32.75 feet, Emergency Depressurization is required because _____.

A. suppression Pool level is approaching the Safety Relief Valve Tailpipe Vacuum Breakers

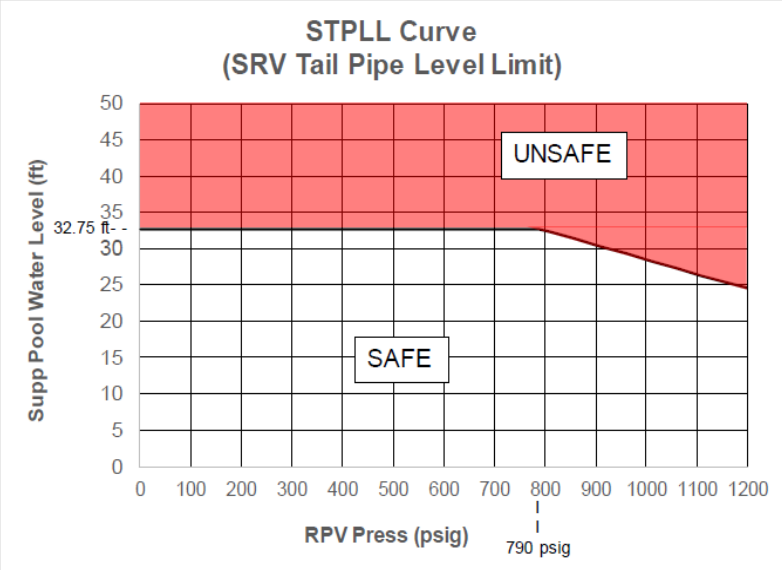
B. the Suppression Pool vent paths will be covered compromising containment integrity

C. continued SRV operation may cause tailpipe damage and directly pressurize containment

D. the Drywell to Suppression pool vacuum breaker downcomers will be covered jeopardizing containment

Answer: C

Answer Explanation



ANSWER (C)	**Continued SRV operation may cause tailpipe damage and directly pressurize containment is correct:** 32.75 feet is the highest level at which the SRV operation can continue unrestricted. As Rx pressure rises, SRV operation is limited to lower SP levels. At SP levels above 32.75, there is a hazard of damaging the tailpipes of the selected SRV which in turn could lead to direct pressurization of the containment on subsequent operation.
DISTRACTOR (A)	**Suppression Pool level is approaching the Safety Relief Valve Tailpipe Vacuum Breakers is wrong:** This is a plausible distractor to the candidate as the concern as noted above is SRV tailpipe damage. The SRV vacuum breakers are also required to prevent tailpipe damage from drawing water into the tailpipe following operation However, the vacuum breakers are located in the drywell and are therefore not impacted by SP level.
DISTRACTOR (B)	**The Suppression Pool vent paths will be covered compromising containment integrity is wrong:** SP vent paths are a plausible distractor because they are subject to rising water levels in the SP however, they are located at 38.25 feet and are therefore not impacted at the lower level.
DISTRACTOR (D)	**The Drywell to Suppression pool downcomer vacuum breakers will be covered jeopardizing containment is wrong:** The Downcomer vacuum breakers are a plausible distractor as they will be covered by rising water level in the SP. However, this level is at 48 feet and therefore not impacted at 32 feet.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 70 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495357
Version ID:	3194317
User-Defined ID:	Q #70 NEW
Cross Reference Number:	CLOSED
Topic:	STPLL Basis
Num Field 1:	LM
Num Field 2:	RO-Low
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295025 EA2.04 4.0
KA Statement	HIGH REACTOR PRESSURE: Ability to determine or interpret the following as they apply to (EPE 2) HIGH REACTOR PRESSURE:Suppression pool level
Cognitive level	Low
Safety Function	3
10 CFR 55	41.10
Technical Reference with Revision No:	T-102 Rev.028 T-102 Basis Rev.029
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1560.02c

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

71 **ID: 2505274** **Points: 1.00**

Unit 2 is operating at 100% power

Secondary Containment is established

Reactor Enclosure HVAC system exhaust fans have tripped due to an electrical transient

- The Supply Fans continue to run until they are manually secured
- Operators have restarted the system and Reactor Enclosure Delta-P is steady at -0.05 inches
- 2A Reactor Enclosure Exhaust Rad Monitor has spiked to 1.68 mr/hr

WHICH ONE of the following identifies when a Standby Gas Fan will start (if ever) and why (why not)?

A. Does not start because no isolation signal is or will be present

B. Standby Gas Fan starts immediately due to Hi Exhaust Rad isolation

C. Starts in 100 seconds due to low RE differential pressure isolation

D. Starts in 50 minutes due to low RE differential pressure isolation

Answer: D

Answer Explanation

REACTOR ENCLOSURE ISOLATION SIGNALS			
SIGNAL	DIVISION 1	DIVISION 2	SETPOINT
· MANUAL	HS76-*78A	HS76-*78B	Arm & Depress
· EXH. HI RAD	A and B Inst.	C and D Inst.	1.35 mR/Hr
· Low RPV Level/High DW Pressure	A and B Inst.	C and D Inst.	-38", 1.68#
· SGTS Damper Open	HV76-*96	HV76-*97	Not full closed
· Low Zone DP	A	B	-0.1" WG for 50 minutes (still a vacuum, but not enough vacuum)
· RF Isolation	Any Div.1 Isol.	Any Div.2 Isol.	*

ANSWER (D)	**Starts in 50 minutes due to low RE differential pressure isolation is Correct:** On a trip of the running exhaust fans, D/P will drop quickly below the TS limit of -.25" and below -0.10" which starts the low d/p timer. It then takes 50 minutes for the low d/p timer to time out, at which time an isolation is generated and the SGTS fans will start. .
DISTRACTOR (A)	**Does not start because no isolation signal is or will be present is Wrong:** Plausible answer because the RE low d/p timer takes a long time (50 minutes) before it initiates an isolation signal. If the value of D/P provided in the stem had remained above -0.1', the second part answer would be correct. This value is below the low d/p setpoint however and will allow the timer to time out in 50 minutes.
DISTRACTOR (B)	**Standby Gas Fan starts immediately due to Hi Exhaust Rad isolation is Wrong:** Plausible to the candidate who recalls that one of the isolation signals to the Secondary containment is Hi Exhaust Rad levels greater than 1.35 mr/hr. This does require the proper logic makeup of 2 Rad monitors to start cause an isolation. One failed rad monitor will cause an alarming condition but will not initiate the isolation and Standby Gas start.
DISTRACTOR (C)	**Starts in 100 seconds due to low RE differential pressure isolation is Wrong:** Plausible answer as low D/P in the Refuel floor will start a 100 second timer to initiate a Secondary Containment isolation. However, this is the timer for the Refuel Floor. The Rx Encl. timer is 50 minutes

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 71 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2505274
Version ID:	3185820
User-Defined ID:	Q #71 NEW
Cross Reference Number:	CLOSED
Topic:	Knowledge of the effect that a loss/ malfunction of SGTS has on Sec Cont D/P
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	ILT

Comments:

References Provided	NONE
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	261000 A1.04 3.7
KA Statement	Standby Gas Treatment Ability to predict and/or monitor changes in parameters associated with operation of the (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM including: Secondary containment differential pressure.
Cognitive level	High
Safety Function	9 - Radioactivity Release
10 CFR 55	41.7 / 45.6
Technical Reference with Revision No:	M-0076
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0076.4E

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

72 **ID: 2495430** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- Normal electrical lineup
- D12 EDG running in **standby** following a remote manual start

LGS has entered E-5 "Grid Emergency" due to a Voltage Reduction Alert from the TSO

A grid disturbance on the 500KV Transmission system results in 201 Safeguard Bus voltage lowering to 60% for 5 seconds before recovering to normal.

WHICH ONE of the following identifies the breaker that will be closed and the operating mode of the D12 Diesel Generator following the grid disturbance?

	BREAKER CLOSED	D12 D/G OPERATING MODE
A.	101-D12	Isochronous
B.	101-D12	Droop
C.	D12 D/G Bkr	Droop
D.	D12 D/G Bkr	Isochronous

Answer: D

Answer Explanation

In a normal electrical lineup, the D12 bus is supplied by the 201-D12 4kv feeder breaker. . As the event described in the stem progresses, the integrated plant response is as follows: When the 201 Safeguard voltage drops below 70% for 1 sec, the 201-D12 Breaker will trip. Bus undervoltage relay will trip and because the Diesel Generator is already running, the Diesel will swap to the Isochronous mode and the output breaker will close 0.5 seconds later. This will be before the Dead Bus transfer to the 101-D12 Breaker can occur (1 second).

ANSWER (D)	**D12 D/G, Isochronous is correct:** If 201 Safeguard voltage drops below 70% for 1 sec, the 201-D12 Breaker will trip. If the Diesel Generator is already running, the Diesel will swap to the Isochronous mode and the output breaker will close 0.5 seconds later which will be before the Dead Bus transfer to the 101-D12 Breaker can occur (1 second).
DISTRACTOR (A)	**101-D12, Isochronous is wrong:** The first part is possible because the normal alternate source is the 101-D12 feeder to the D12 bus. But as explained above, with D12 EDG running unloaded, it will close its output breaker in 0.5 seconds. The second part, isochronous, is correct.
DISTRACTOR (B)	**101-D12, Droop is wrong:** The first part is plausible because the normal alternate source is the 101-D12 feeder to the D12 bus. But as explained above, with D12 EDG running unloaded, it will close its output breaker in 0.5 seconds. The second part is plausible because the D12 EDG will start in Droop mode when manually started, but on a dead bus signal it would swap to isochronous
DISTRACTOR (C)	**D12 D/G, Droop is wrong:** **T**he first part of the answer option is correct. is the second part is plausible because the EDG starts in droop mode on a manual start. But as noted, on the dead bus signal, it swaps to isochronous mode to power the bus.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 72 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	6
Difficulty:	3.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495430
Version ID:	3185686
User-Defined ID:	Q #72 BANK
Cross Reference Number:	CLOSED
Topic:	Grid Disturbance EDG
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	N/A
Additional Information	None

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	700000 AK2.10 3.9
KA Statement	) Knowledge of the relationship between the (APE 25) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following systems or components: Emergency generators (diesel/jet)
Cognitive level	High
Safety Function	6
10 CFR 55	41.8
Technical Reference with Revision No:	E-10/20 Rev.060
Question History: (i.e. LGS NRC-05)	Bank - 2029711
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS0092A.04A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

73 **ID: 2495996** **Points: 1.00**

Unit 1 operating at 100% power

- A leak of Hydrogen from the Main Generator causes H2 pressure to drop
- ON-126, "Uncontrolled Main Generator Hydrogen Depressurization" has been entered
- H2 pressure is currently 61 psig and down 2 psig per minute
- Stator coolant temperature is rising, currently 72 °C up 2 °C/min

With no operator action, when will a Stator Coolant Water runback initiate?

A. 4 minutes

B. 6 minutes

C. 8 minutes

D. 10 minutes

Answer: A

Answer Explanation

Loss of Stator Cooling detected by any of the following:

- Inlet pressure (U1: < 45 psig)
  (U2: < 39.4 psig)
- High Stator Water bulk outlet temperature >80 °C
- Bushing coolant flow < 84 gpm.

ANSWER (A)	**4 minutes is correct:** Current Bulk Temp. is 72°C rising at 2°C/min. means that the setpoint will be reached in 4 minutes.
DISTRACTOR (B)	6 **minutes is wrong:** Plausible answer if the candidate considers pressure is 61 psig and dropping at 2 psig/min. In 6 minutes it will be 49 psig and SCW pressure is maintained 3-5 psig below Hydrogen cooling gas pressure. The SCW runback setpoint is system pressure <45 psig on Unit 1. Another consideration however,is that the SWC flow control valve is gagged open to maintain greater than 45 psig pressure regardless of H2 pressure. Therefore, a low press. runback should not occur due to H2 pressure.
DISTRACTOR (C)	**8 minutes is wrong:** Plausible to the candidate who recalls the SCW setpoint of 45 psig but applies that to the H2 pressure forgetting that there is a 3-5 psid difference .Incorrect because the setpoint will be reached in 4 minutes.
DISTRACTOR (D)	**10 minutes is wrong:** Plausible to the candidate who calculates the time using the unit 2 SCW pressure setpoint of approximately 40 psig (39.4)

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 73 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495996
Version ID:	3194318
User-Defined ID:	Q #73 NEW
Cross Reference Number:	CLOSED
Topic:	H2 Cooling SWC RB
Num Field 1:	LM
Num Field 2:	RO-Hgh
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data		
Level	RO	
Tier	2	
Group	2	
KA # and Rating	245000 K4.02 3.1	
KA Statement	Knowledge of (SF4 MTGEN) MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS design features and/or interlocks that provide for the following: Generator cooling	
Cognitive level	High	
Safety Function	4	
10 CFR 55	41.7	
Technical Reference with Revision No:	ON-126 ON-114	Rev.014 Rev.036
Question History: (i.e. LGS NRC-05)	New	
Question Type: (New, Bank, Modified)	New	
Revision History:		
Training Objective	LGSOPS0033.02d	

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

74 **ID: 2495174** **Points: 1.00**

Unit 2 is at 100% power with the following conditions:

- 2A CRD pump in service
- '2A' RHR Pump is in service in Suppression Pool Cooling.

The following alarms are received:

- 220 G-1 2 UNIT DIV 1 SFGD BATTERY CHARGER TROUBLE
- 220 G-3 2PPA1/2PPA3 125V DC DIST PANELS UNDERVOLTAGE
- 220 G-4 2PPA2 125V DC DIST PANEL UNDERVOLTAGE

Reactor level lowers to -150 inches.

Consider: E-2FA, "Loss of Division 1 Safeguard 125/250V DC Bus 2FA"
E-2FC, "Loss of Division 3 Safeguard 125V DC Bus 2FC"

WHICH ONE of the following describes:

(1) The procedure(s) to be entered?

AND

(2) The pump that will be running at the current water level with no operator action?

	(1)	(2)
A.	E-2FA Only	'2A' CRD
B.	E-2FA Only	'2A' RHR
C.	E-2FA, E-2FC	'2A' CRD
D.	E-2FA, E-2FC	'2A' RHR

Answer: B

Answer Explanation	
ANSWER (B)	**E-2FA, 2A RHR; Correct.** The annunciators provided in the stem are an indication of a loss of Division 1 DC on unit 2. With Division 1 DC de-energized, 4KV breakers on the D21 Bus will lose control power. This will prevent the breakers from being operated remotely or automatically. Since the "2A" RHR Pump breaker was already closed, it will remain closed after the LOCA since it will be unable to automatically trip.
DISTRACTOR (A)	**E-2FA, '2A' CRD; Wrong.** The first part is correct. The second part is plausible because '2A' CRD pump is running and would normally trip on a LOCA signal therefore applicants could conclude it will keep running due to the loss of DC breaker control power, similarly to the 2A RHR pump. Incorrect because 2A CRD is powered from the D23 bus. Therefore, it would trip on the LOCA
DISTRACTOR (C)	**E-2FA, E-2FC,'2A' CRD; Wrong.** Plausible misconception that the 2PPA3 and 2PPA3 annunciators are associate with Division 1 and 3 DC distribution panels. The second part is plausible because '2A' CRD pump is running and would normally trip on a LOCA signal and applicants could conclude it will keep running due to the loss of DC breaker control power, similarly to the 2A RHR pump. Incorrect because 2A CRD is powered from the D23 bus. Therefore, it would trip on the LOCA.
DISTRACTOR (D)	**E-2FA, E-2FC, 2A RHR; Wrong.** Plausible misconception that the 2PPA3 and 2PPA3 annunciators are associate with Division 1 and 3 DC distribution panels. The second part is correct

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 74 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2495174
Version ID:	3194474
User-Defined ID:	Q #74 NEW
Cross Reference Number:	CLOSED
Topic:	Predict Impact of Div 3 4 KV loss on Pumps following LOCA
Num Field 1:	LM
Num Field 2:	RO-High
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	This question meets the KA because it requires the candidate to recognize the procedure for loss of Divisional DC and recognize the loads lost and unavailable for use.
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	1
Group	1
KA # and Rating	295004 AA2.01 4.0
KA Statement	Ability to determine or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF DC POWER: Partial or complete loss of DC power
Cognitive level	HIGH
Safety Function	6 - Electrical
10 CFR 55	(CFR: 41.7 / 45.8)
Technical Reference with Revision No:	E-2FA Rev 11 SE-10 Rev 66
Question History: (i.e. LGS NRC-05)	NEW
Question Type: (New, Bank, Modified)	NEW
Revision History:	
Training Objective	LGSOPS0092A.8

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

75 **ID: 2504247** **Points: 1.00**

Unit 1 is operating at 100% power with the following conditions:

D13 4KV bus de-energizes with the following annunciators:

- 121-A1, "D13 Bus Diff / Overcurrent Lockout"
- 121-B1, "D13 Bus Undervoltage"

10 seconds later, what is the status of D13 EDG and required operator action (if any) per E-D13,"Loss of D13 Safeguard Switchgear"?

Consider: S87.1.A, "Startup of Drywell Chilled Water System"
S78.7.A, "Control Room HVAC System Restoration from an Isolation"

	D13 EDG Status	Required Action
A.	Did not start	Ensure 1B Drywell Chiller in service per S87.1.A
B.	Did not start	Reset C channel MCR HVAC isolation per S78.7.A
C.	Running Unloaded	Ensure 1B Drywell Chiller in service per S87.1.A
D.	Running Unloaded	Reset C channel MCR HVAC isolation per S78.7.A

Answer: C

Answer Explanation

ANSWER (C)	**Running Unloaded, Ensure 1B Drywell Chiller in service per S87.1.A is correct:** The alarms received when the bus de-energized indicate that there was a bus fault / lockout. This indicates that no re-energization can occur until the fault is cleared. Therefore, the EDG will not close onto the bus. In this case, the D13 EDG will start and run unloaded. The 1A Drywell Chiller is normally operated and powered from D13 bus. With the loss of the bus, no drywell cooling would exist. Placing the 1B DW chiller in service is directed from step 2.9 of E-D13.
DISTRACTOR (A)	**Did not start, Ensure 1B Drywell Chiller in service per S87.1.A is wrong:** Plausible that the EDG would not start. With the Lockout on the bus,however, this will not occur and the bus will remain de-energized with the Diesel running unloaded.The second part is correct.
DISTRACTOR (B)	**Did not start, Reset C channel MCR HVAC isolation per S78.7.A is wrong:** Plausible that the EDG would not start With the Lockout on the bus, however, this will not occur and the bus will remain de-energized. Resetting the MCR HVAC isolation is plausible because E-D13 step 3.2 directs the resetting of the isolation when the bus is re-energized, but that is not possible as the bus remains de-energized
DISTRACTOR (D)	**Running Unloaded, Reset B channel MCR HVAC isolation Reset C channel MCR HVAC isolation per S78.7.A is wrong:** The first part of the answer option is correct. Resetting the MCR HVAC isolation is plausible Because E-D13 step 3.2 directs the resetting of the isolation when the bus is re-energized, but that is not possible as the bus remains de-energized.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 75 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504247
Version ID:	3193731
User-Defined ID:	Q #75 NEW
Cross Reference Number:	CLOSED
Topic:	EDG Response Bus Fault
Num Field 1:	LM
Num Field 2:	RO- High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	RO
Tier	2
Group	1
KA # and Rating	264000 A2.09 4.7
KA Statement	Ability to (a) predict the impacts of the following on the (SF6 EGE) EMERGENCY GENERATORS (DIESEL/JET) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of a safety bus
Cognitive level	High
Safety Function	6
10 CFR 55	41.5
Technical Reference with Revision No:	E-D13 Rev.014
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS0092.07

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

76 **ID: 2491265** **Points: 1.00**

**********SRO ONLY**********

Unit 2 TIPS are in operation per S74.0.A, OPERATION OF TRAVERSING IN-CORE PROBE SYSTEM

- Unit 2 Reactor Level drops to -90"

2B TIP indicates the following:

- IN-SHIELD white light lit
- FWD white light **not** lit
- REVERSE white light **not** lit
- XV-059-240B, B CHAN TIP GDE TUBE XPL SHEAR ASSY PCIV, indicates open
- XV-059-241B, B CHAN TIP GUIDE TUBE VLV (Ball) ASSEMBLY PCIV, indicates open

As it relates to TIP operation **only**, which procedure action is required to be performed/verified first?

A. Manually withdraw 2B TIP per S74.0.F, REMOVAL OF STUCK TIP DETECTOR

B. Close XV-059-240B per S74.0.B TIP ISOLATION IN EVENT OF CONTAINMENT ISOLATION

C. Close XV-059-241B per S74.0.B TIP ISOLATION IN EVENT OF CONTAINMENT ISOLATION

D. Push TIP ISOL RESET per S74.0.A, OPERATION OF TRAVERSING IN-CORE PROBE SYSTEM

Answer: C

Answer Explanation

ANSWER (C)	**Close XV-059-241B per S74.0.B TIP ISOLATION IN EVENT OF CONTAINMENT ISOLATION is correct.** The indications given with RPV level below -38" would result in a TIP isolation signal being generated per GP-8 and GP-8.1. The expected response is that the TIP would be withdrawn and the ball valve, XV-059-241B would be closed. In the stem, the TIP indicates that it is withdrawn (IN-SHIELD light lit), but the ball valve indicates open. S74.0.B step 4.3.2 gives direction to close the ball valve, and the ball valve is normally manually opened and closed from the MCR per S74.0.A.
DISTRACTOR (A)	**Manually withdraw 2B TIP per S74.0.F, REMOVAL OF STUCK TIP DETECTOR is wrong.** This is plausible because neither the REVERSE white light nor the FWD light is lit, meaning the TIP is not currently moving. This is wrong because the TIP is in its shield and not moving in either direction.
DISTRACTOR (B)	**Close XV-059-240B per S74.0.B TIP ISOLATION IN EVENT OF CONTAINMENT ISOLATION is wrong.** This is plausible because XV-059-241B ball valve is expected to be closed, but is wrong because XV-059-240B is expected to be open. The similar numbering and nomenclature can lead to confusion. This is also plausible because of the unique isolation logic, in that XV-059-240B will never automatically close, even on a valid isolation signal.
DISTRACTOR (D)	**Push TIP ISOL RESET per S74.0.A, OPERATION OF TRAVERSING IN-CORE PROBE SYSTEM is wrong.** This is plausible because the RPV Level given in the stem is between the Low Level 2 and Low Level 1 isolation setpoints, and that no isolation signal would be generated based on Low Level 1. This is wrong, however, because TIPS isolate on Low Level 2. The TIP ISOL RESET pushbutton is pressed during normal operation per S74.0.A prior to beginning TIP movement.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 76 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2491265
Version ID:	3185695
User-Defined ID:	Q #76 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) Abnormal TIP valve position, procedure to mitigate
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires the candidate to identify isolation signals and expected system response as it relates to TIP operation, then to use procedures to mitigate the consequence of a malfunction of an automatic valve operation
SRO-Only Justification	This question requires the candidate to not only assess the expected condition of a system under emergency conditions, but to direct a portion of a procedure to mitigate the consequences of a malfunction.
Additional Information	N/A

General Data	
Level	SRO
Tier	2
Group	2
KA # and Rating	215001A2.06 / 3.1
KA Statement	(215001A2.06) Ability to (a) predict the impacts of the following on the (SF7 TIP) TRAVERSING IN CORE PROBE and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Abnormal valve position (BWR 2, 3, 4, 5)
Cognitive level	High
Safety Function	7
10 CFR 55	CFR: 41.5 / 45.6
Technical Reference with Revision No:	GP-8.1 U/2, Rev. 16 S74.0.B, Rev. 8
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0074C.5

77 **ID: 2491304** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is operating at 100% power

Unit 1 is in Day 1 of a maintenance outage

- Shutdown cooling is in service with primary coolant temperature at 209 °F down slow

Alarm 010-C4, "SPRAY POND LO LEVEL / HI TEMP" was received earlier in the shift

EO reports: Current Spray Pond temperature is 86.5 °F
Spray Pond Water level is 251 feet 2 inches above mean sea level (MSL)

What is the required surveillance frequency to verify Spray Pond temperature?

AND

If temperature exceeds the allowable limit, what is the most limiting required action?

	Temperature Surveillance Frequency	Most Limiting Action
A.	Verify temperatures every 2 hours	Be in Hot Shutdown within the next 12 hours and in Cold Shutdown within the next 24 hours
B.	Verify temperatures every 2 hours	Declare the RHRSW system and the emergency service water system inoperable and take the ACTION required by Specifications 3.7.1.1 and 3.7.1.2
C.	Verify temperatures every 4 hours	Be in Hot Shutdown within the next 12 hours and in Cold Shutdown within the next 24 hours
D.	Verify temperatures every 4 hours	Declare the RHRSW system and the emergency service water system inoperable and take the ACTION required by Specifications 3.7.1.1 and 3.7.1.2

Answer: A

Answer Explanation	
ANSWER (A)	**Verify temperature every 2 hours, Be in Hot Shutdown within 12 hours and Cold Shutdown within the next 24 hours is correct.** The alarm comes in at 80 °F. The Surveillance frequency control program (SFCP) lists the frequency of required testing when temperatures are elevated. TS 4.7.1.3.b.2 refers the operator to the SFCP for temperatures >85°F. Page SFCP-11 of the SFCP list the specs and frequencies. 4.7.1.3.b.2 for temps >85 °F is 2 hours.Spray Pond temperature is required to be maintained below 88 °F. Temp is given as currently 86.5 °F. When applying TS 3.7.1.3, the action a. is for OPCON 1,2,3 with a shutdown statement listed above. The candidate must recognize that 209 °F is OPCON 3. Therefore with Unit 2 at 100% and Unit 1 in OPCON 3, the most limiting action is action **a.**
DISTRACTOR (B)	**Verify temperature every 2 hours, Declare the RHRSW system and the emergency service water system inoperable and take the ACTION required by Specifications 3.7.1.1 and 3.7.1.2 is wrong.** This is plausible to the candidate who determines that the OPCON 4,5 tech spec is applicable because they believe that a coolant temperature less than 212 °F is the threshold for OPCON 4. This is incorrect, OPCON 4 entry is less than 200 °F.
DISTRACTOR (C)	**Verify temperature every 4 hours, Be in Hot Shutdown within 12 hours and Cold Shutdown within the next 24 hours is wrong.** Plausible to verify temperature every 4 hours as 4.7.1.3.b.1 and the SFCP lists temperature >80°F as that threshold for increased monitoring.. However, this frequency is eclipsed by the 2 hour requirement (4.7.1.3.b.2) when temperature exceeds 85°.
DISTRACTOR (D)	**Verify temperature every 4 hours, Declare the RHRSW system and the emergency service water system inoperable and take the ACTION required by Specifications 3.7.1.1 and 3.7.1.2, is wrong.** Plausible to verify temperature every 4 hours as 4.7.1.3.b.1 and the SFCP lists temperature >80°F as that threshold for increased monitoring.. However, this frequency is eclipsed by the 2 hour requirement (4.7.1.3.b.2) when temperature exceeds 85° The second part is plausible to the candidate who determines that the OPCON 4,5 tech spec is applicable because they believe that a coolant temperature less than 212 °F is the threshold for OPCON 4. This is incorrect, OPCON 4 entry is less than 200 °F. Plausible to verify temperature every 4 hours as 4.7.1.3.b.1 and the SFCP lists temperature >80°F as that threshold. However, this is eclipsed by the 2 hour requirement when temperature exceeds 85

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 77 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2491304
Version ID:	3195868
User-Defined ID:	Q #77 NEW
Cross Reference Number:	OPEN
Topic:	(SRO Only) Spray Pond High Temp Actions
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	TS 3.7.1.3 U1 and U2, SFCP pg.11 U1 and U2
K/A Justification	This question asks the candidate to assess ESW/RHRSW spray pond temperature as controlled by Tech Spec 3.7.1.3. The candidate must determine that Temperature is abnormally high and then use Tech spec actions and surveillance frequencies to determine remedial action.
SRO-Only Justification	This is written at the SRO level because it requires operability determination of the spray pond and LCO action determination.
Additional Information	None

General Data	
Level	SRO
Tier	2
Group	2
KA # and Rating	510000A2.07 / 3.6
KA Statement	(510000A2.07) Ability to (a) predict the impacts of the following on the (SF4 SWS*) SERVICE WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Abnormal Intake Water Temperature
Cognitive level	High
Safety Function	4
10 CFR 55	CFR: 41.5 / 45.6
Technical Reference with Revision No:	TS 3.7.1.3 U/1 AMD 186 TS 3.7.1.3 U/2 AMD 219 SFCP U1 Rev 083 SFCP U2 Rev 083
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0010.9

78 **ID: 2502544** **Points: 1.00**

**********SRO ONLY**********

Unit 2 plant conditions are as follows:

- A LOCA is in progress
- RPV level dropped to -285 inches but has recovered and level is now -159 inches up slow
- SAMPS were entered 10 hours ago
- Drywell Hydrogen is 6.1%
- Drywell Oxygen is 4.4%
- Suppression Pool Hydrogen is 4.8%
- Suppression Pool Oxygen is 5.5%

WHICH ONE of the following identifies the required action for Containment atmosphere control?

A. Vent the Suppression Pool up to the General Emergency limits

B. Vent the Suppression Pool regardless of Offsite release limits

C. Vent the Drywell up to the General Emergency limits

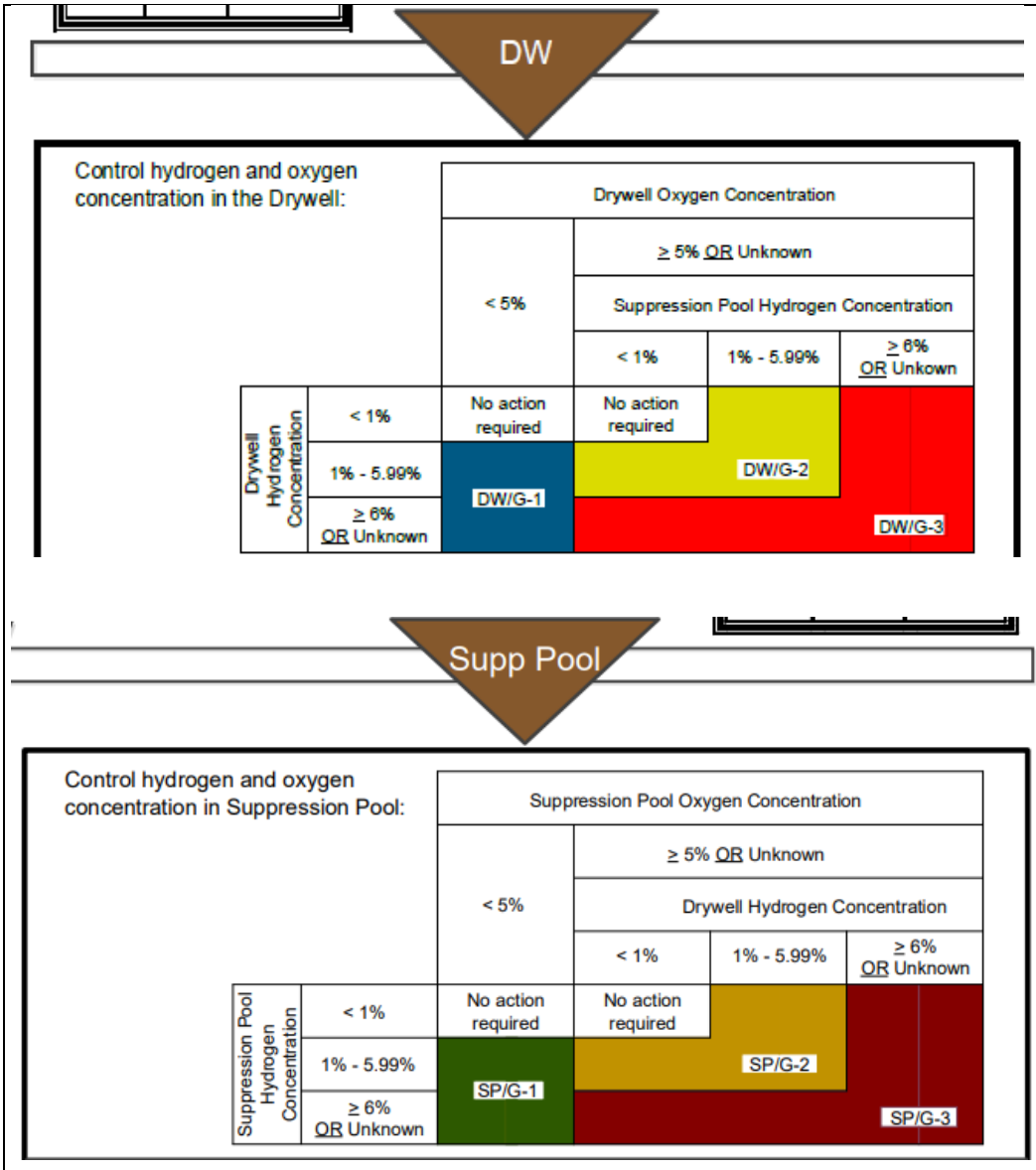
D. Vent the Drywell regardless of Offsite release limits

Answer: B

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation



Based on the conditions presented, the candidate must evaluate both legs concurrently. For the DW leg, Drywell Hydrogen is 6.1% means the candidate should use the bottom row on the left column for >6% (or unknown). Then evaluating DW O2 at 4.4% means that the candidate should use the <5%, left most column. The Intersection of which leads to DW/G-1

Evaluating the Suppression pool leg next. SP H2 concentration is 4.8%. This directs us to the middle row (1%-5.99%). Suppression Pool O2 is evaluated at 5.5% which then requires us to evaluate DW Hydrogen. This is 6.1%. The rightmost column of >6% or unknown is selected. The intersection of this column and the middle row is SP/G-3

.

SP/G-3 contains the step to vent at the maximum rate per the available vent (T-228, T-341, T-200)

ANSWER (B)	**Vent the Suppression Pool regardless of Offsite release limits; Correct:** As noted above, evaluating the table would lead to SP/G-3 as the strategy. Venting regardless of Tech Spec/ ODCM limits is required as the reduction in the explosive concentration of gases takes precedence over rad limit concerns. TSG-3.3 allows the candidate to translate SP/G-3 to the "exceed Limits".
DISTRACTOR (A)	**Vent the Suppression Pool up to the General Emergency limits; Wrong:** Plausible to the candidate who evaluates the SP table and determined that SP/G-2 is correct by transposing some of the containment values. SP/G-2 would limit release to the GE level. However, as demonstrated above, SP/G-3 is correct and release should not be limited to GE limit.
DISTRACTOR (C)	**Vent the Drywell up to the General Emergency limits; Wrong:** Plausible to the candidate who incorrectly evaluates the DW table and determines that DW/G-2 is the correct strategy by using SP H2 concentration instead of DW H2 concentration in the Left side SP H2 concentration and uses the SP O2 concentration instead of the DW O2 for the top of the table. As noted, actual DW conditions place the plant in DW/G-1
DISTRACTOR (D)	**Vent the Drywell regardless of Offsite release limits; Wrong:** Plausible to the candidate who incorrectly evaluates the table and determines that DW/G-3 is the correct strategy by using DW O2 concentration in the 4th line column of the DW table rather than the H2 concentration. However, a correct evaluation of the table would determine that DW/G-1 is correct

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 78 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2502544
Version ID:	3191157
User-Defined ID:	Q #78 NEW
Cross Reference Number:	OPEN
Topic:	SRO Only - SAMP 2 H2 Containment Limit
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	SAMP 2 PC/G Leg
K/A Justification	The KA requires the applicant to determine Containment H2 limits when high H2 is present. Using the tables in the question, the applicant must do exactly that and then determine the correct strategy.
SRO-Only Justification	N/A
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	2
KA # and Rating	500000 EA2.05 3.9
KA Statement	Ability to determine or interpret the following as they apply to (EPE 16) HIGH CONTAINMENT HYDROGEN CONCENTRATION: (CFR: 41.10 / 43.5 / 45.13) Hydrogen concentration limits for containment
Cognitive level	High
Safety Function	5 - Containment Integrity
10 CFR 55	41.10 / 43.5 / 45.13
Technical Reference with Revision No:	SAMP-2 Rev 14
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1562.04

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

79 **ID: 2506881** **Points: 1.00**

**********SRO ONLY**********

Unit 1 has just completed power ascension to 100% when a P-1 indicates the following:

- MFLCPR 1.02
- MCPR is 1.06

WHICH ONE of the following identifies:

(1) The procedurally directed method(s) to reduce reactor power?

AND

(2) The earliest NRC notification time required for this event?

	Method to Reduce Rx Power	NRC Notification
A.	Control Rods Only	1 hour
B.	Control Rods Only	8 hours
C.	Control Rods and Recirc Flow Reduction	1 hour
D.	Control Rods and Recirc Flow Reduction	8 hours

Answer: A

Answer Explanation

ANSWER (A)	**Control Rods Only, 1 hour is Correct:** Based on T.S.2.1.2, "The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than 1.07 with the reactor vessel steam dome pressure greater than 700 psia and core flow greater than 10% of rated flow." GP-14 is entered on a Thermal Limit violation and directs "Reduce Rx power using control rods only". The NRC Operations Center shall be notified within 1 hour in accordance with T.S. 6.7.1.a, The NRC Operations Center shall be notified by telephone as soon as possible and in all cases within 1 hour."
DISTRACTOR (B)	**Control Rods Only, 8 hours is wrong:** 8 hour notification for NRC is plausible to the candidate who recalls SAF 1.4 for Degraded or Unanalyzed condition. This requires an 8 hour notification for an unanalyzed condition that significantly degrades plant safety. The SAF then lists example conditions such as degraded Fuel cladding. A SL violation requires a 1 hr NRC notification.
DISTRACTOR (C)	**Control Rods and Recirc Flow Reduction, 1 hour is Wrong:** Plausible to the candidate who recalls that entry into GP-14 is required for a thermal limit violation and recalls the MFLPD actions to reduce power per the RMSI (rods and flow). As noted above, Recirc flow reduction is wrong and would actually worsen the MFLCPR problem
DISTRACTOR (D)	**Control Rods and Recirc Flow Reduction, 8 hours is Wrong:** GP-14 direct a Power reduction and an 8 hour notification for NRC is plausible to the candidate who recalls SAF 1.4 for Degraded or Unanalyzed condition. This requires an 8 hour notification for an unanalyzed condition that significantly degrades plant safety. The SAF then lists example conditions such as degraded Fuel cladding. These answers are wrong as GP-14 directs rods only power reduction and as MCPR <1.07 is a SL violation requiring a 1 hr NRC notification

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 79 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2506881
Version ID:	3195870
User-Defined ID:	Q #79 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO ONLY) Reporting Req. SL Violation
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	Safety Limit violation reporting requirements are an SRO responsibility
Additional Information	None

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	G2.2.38 / 4.5
KA Statement	EQUIPMENT CONTROL Knowledge of conditions and limitations in the facility license (CFR: 41.7 / 41.10 / 43.1 / 45.13)
Cognitive level	High
Safety Function	N/A
10 CFR 55	CFR 41.7 / 41.10 / 43.1 / 45.13
Technical Reference with Revision No:	Tech Specs
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS1800.6b

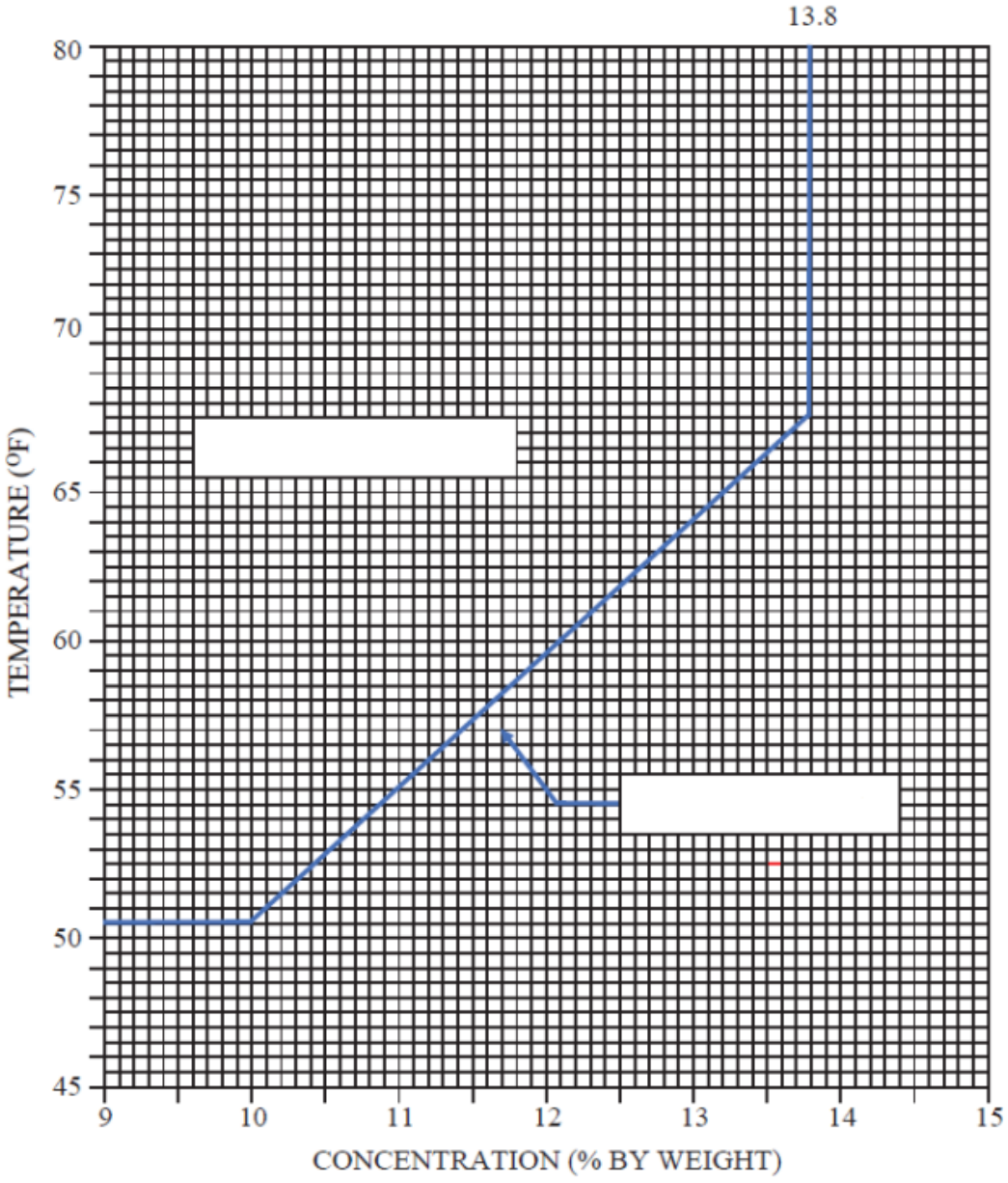
80 **ID: 2490714** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is at 100% Reactor Power.

A Chemistry Technician performing ST-5-048-800-2, SBLC SODIUM PENTABORATE CONCENTRATION ANALYSIS, reports the following values:

- SBLC Tank Temperature 63 °F
- SBLC Boron Concentration 12.9 % by weight



Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Determine:

(1) Whether the SBLC System is OPERABLE, **and**
(2) What would be the consequence of being in the unsafe region of the graph above, Tech Spec Figure 3.1.5-1, SODIUM PENTABORATE SOLUTION TEMPERATURE/CONCENTRATION REQUIREMENTS

	(1)	(2)
A.	OPERABLE	Precipitation of sodium pentaborate in the event of a loss of tank heating may occur
B.	OPERABLE	A sufficient quantity of boron to bring the reactor to a cold, Xenon-free shutdown may not be present
C.	INOPERABLE	Precipitation of sodium pentaborate in the event of a loss of tank heating may occur
D.	INOPERABLE	A sufficient quantity of boron to bring the reactor to a cold, Xenon-free shutdown may not be present

Answer: C

Answer Explanation

ANSWER (C)	I**NOPERABLE; Precipitation of sodium pentaborate in the event of a loss of tank heating may occur is correct.** The graph, Tech Spec Figure 3.1.5-1, has had labels removed for the purposes of the test; the block in the upper left is labeled "Operating Range" in Tech Specs, and labeled "Operating Limit" in the lower right block. Correctly plotting the values given, the point will be just outside of the Operating Range, and on the wrong side of the Operating Limit. Tech Spec basis 3.1.5 states "The upper limit concentration of 13.8% has been established as a reasonable limit to prevent precipitation of sodium pentaborate in the event of a loss of tank heating, which allow the solution to cool."
DISTRACTOR (A)	**OPERABLE; Precipitation of sodium pentaborate in the event of a loss of tank heating may occur is wrong.** This is wrong because the plotted point is on the wrong side of the Operating Limit. This would fail to meet SR 4.1.5.a.1 and 4.1.5.a.3, making SBLC INOP. This is plausible because the graph labels have been removed, requiring understanding of the basis of the graph to correctly interpret it. Additionally, the plotted point is very close to the operating limit and could reasonably be plotted incorrectly.
DISTRACTOR (B)	**OPERABLE; A sufficient quantity of boron to bring the reactor to a cold, Xenon-free shutdown may not be present is wrong.** This is wrong because the plotted point is on the wrong side of the Operating Limit. This would fail to meet SR 4.1.5.a.1 and 4.1.5.a.3, making SBLC INOP. This is plausible because the graph labels have been removed, requiring understanding of the basis of the graph to correctly interpret it. Additionally, the plotted point is very close to the operating limit and could reasonably be plotted incorrectly. The second part is wrong because it is the weight determination of Boron-10 by analysis is the method to ensure compliance with the associated surveillance, SR 4.1.5.b.2, to ensure sufficient boron is present in the tank. The second part is plausible because the x-axis of the graph is concentration of boron as a weight percent; being on the wrong side of the Operating Limit could plausibly be extended to mean concentration is too low, and thus insufficient boron is in the tank.
DISTRACTOR (D)	**INOPERABLE; A sufficient quantity of boron to bring the reactor to a cold, Xenon-free shutdown may not be present is wrong.** The second part is wrong because it is the weight determination of Boron-10 by analysis is the method to ensure compliance with the associated surveillance, SR 4.1.5.b.2, to ensure sufficient boron is present in the tank. The second part is plausible because the x-axis of the graph is concentration of boron as a weight percent; being on the wrong side of the Operating Limit could plausibly be extended to mean concentration is too low, and thus insufficient boron is in the tank.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 80 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2490714
Version ID:	3194323
User-Defined ID:	Q #80 NEW
Cross Reference Number:	OPEN EMBEDDED
Topic:	(SRO Only) SLC, surveillances
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	Embedded SLC concentration graph from TS Figure 3.1.5-1
K/A Justification	The question requires proper understanding of the surveillance requirements associated with the SBLC system, as well as the basis of those SR.
SRO-Only Justification	This question requires understanding of below the line SR information, as well as the basis of the SR.
Additional Information	N/A

General Data	
Level	SRO
Tier	2
Group	1
KA # and Rating	(211000) (G2.2.12) / 4.1
KA Statement	(211000) (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM (G2.2.12) EQUIPMENT CONTROL Knowledge of surveillance procedures (CFR: 41.10 / 43.2 / 45.13)
Cognitive level	High
Safety Function	1
10 CFR 55	CFR: 41.10 / 43.2 / 45.13
Technical Reference with Revision No:	TS 3.1.5 Amendment 203
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0048.13.b

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

81 **ID: 2507289** **Points: 1.00**

**********SRO ONLY**********

Plant conditions are as follows:

- Loss of all AC power
- All rods in
- Reactor level is -145 inches, down slow
- Suppression Pool level is 13 ft 6 inches due to a leak
- RCIC is injecting at rated flow
- Suppression Pool pressure is 12 psig up slow

Suppression Pool temperature is 150 °F

- No other RPV injection sources are available

WHICH ONE of the following actions are required?

A. Open 5 ADS valves per T-112, "Emergency Blowdown"

B. Direct the PRO to continue injecting with RCIC at rated flow

C. Limit RCIC injection to 450 GPM per T-102 Sheet 2, "NPSH/Vortex Limit Curve"

D. Direct EO to perform T-238, "Defeating RCIC High Exhaust Pressure Turbine Trip"

Answer: B

Answer Explanation
NPSH and vortex limits should be observed if possible but may be exceeded if the situation warrants. A judgment as to whether a pump should be operated beyond its limits in a particular event should consider such factors are: • The availability of other systems • The anticipated length of time such operation may be required • The degree to which the limit will be exceeded • The sensitivity of the pump to operation beyond the limit • The consequences of not maintaining core submergence by not operating the pump beyond the limit Immediate and catastrophic failure is not expected if a pump is operated beyond its NPSH or vortex limit. The undesirable consequences of uncovering the reactor core should thus outweigh the risk of equipment damage

ANSWER (B)	**Direct the PRO to continue injecting with RCIC at rated flow is correct:** RCIC injection is directed when RCIC is required for core cooling regardless of vortex limits or containment pressurization concerns. Precautions are noted in T-101 for conditions when SP temperature is >170 °F. That is not the case here. Because level is down slow, any reduction in RCIC flow would accelerate the time until core uncovery. Pg.44, statement above lists the factors to consider for exceeding vortex limits.
DISTRACTOR (A)	**Open 5 ADS valves per T-112, "Emergency Blowdown" is wrong:** This is plausible due to the current Reactor water level. With level at -145 inches, the trip execution strategy allow an early decision to blowdown when core uncovery is inevitable. This presumes that the low pressure sources are available to inject. This is incorrect as the stem states that no additional injection sources are available.
DISTRACTOR (C)	**Limit RCIC injection to 450 GPM per T-102 Sheet 2, "NPSH/Vortex Limit Curve" is wrong:** Plausible answer to the candidate who recalls that T-102 sheet 2 provides curves which limit injection for ECCS and RCIC pumps when SP level and temperature are abnormal. In fact, with level at 13.5 ft., RCIC flow rate should be limited to no more than 500 gpm to avoid vortexing concerns. This is wrong however as the t-101 basis above discusses.
DISTRACTOR (D)	**Direct EO to perform T-238, "Defeating RCIC High Exhaust Pressure Turbine Trip" is wrong:** Plausible that the candidate determines that T-238 is vital to the continuing operation of RCIC. A high exhaust pressure trip would prevent RCIC from injecting. However, the trip setpoint is 50 psig and the current SP pressure is 12 psig. The setpoint is not likely to be reached in the near term and would thus not be a priority that would be dispatched.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 81 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	2.50
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507289
Version ID:	3194545
User-Defined ID:	Q #81 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) T-102 - Determine actions required for RCIC with low Supp Pool level
Num Field 1:	LM
Num Field 2:	RO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	
SRO-Only Justification	This is at the SRO level of knowledge as it requires the candidate to apply T-102 actions and determine that HPCI injection/core cooling takes priority over other concerns. The SRO must then direct the proper course of action.
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	295030EA2.05 / 3.4
KA Statement	(295030EA2.05) Ability to determine or interpret the following as they apply to (EPE 7) LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.10 / 43.5 / 45.13) ECCS/RCIC pump flow
Cognitive level	High
Safety Function	2
10 CFR 55	CFR: 41.10 / 43.5 / 45.13
Technical Reference with Revision No:	T-102 Sheet 2 Rev 0 T-102 Rev.028 T-102 bases Rev.029 T-101 Bases Rev.028 T-101 Rev.028
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0055.5

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

82 **ID: 2502984** **Points: 1.00**

**********SRO ONLY**********

Unit 1 was scrammed from 75% power due to a leak in the drywell

Drywell pressure is 7.6 psig

Suppression pool spray was directed by the CRS

When the HS-051-1F024, "1B RHR Pp Full Flow Test Return Vlv" was taken to open, D124 Load Center breaker tripped on overcurrent

- Drywell Temperature is 185 °F steady
- SP pressure is 2.4 psig up slow
- Containment Leak Detector Rad Monitor reads 1.50E+3 cpm and steady

Which of the following describes the required actions per T-102, "Primary Containment Control", to mitigate the containment pressure rise?

A. Vent the Drywell per OT-101, "High Drywell Pressure" Attachment 3

B. Bypass and restore Drywell Cooling per GP-8.5, "Isolation Bypass of Crucial Systems"

C. Spray the Drywell with 1A RHR per T-225, "Startup and Shutdown of Suppression Pool and Drywell Spray" section 4.7

D. Spray the Suppression Pool with 1B RHRSW per T-225 section 4.3

Answer: B

Answer Explanation

From the containment pressure leg drywell spray is not authorized until pool pressure is > 7.5 psig

ANSWER (B)	**Bypass and restore Drywell Cooling per GP-8.5 is correct:** Given the conditions of SP pressure at 2.4 psig, T-102 would direct us to Spray the SP per PC/P-5. When the D124 LC is lost, 1B RHR cannot be aligned to spray the SP (or anything else). Therefore, the SRO must determine a different mitigative action. The only available action given is to bypass and restore DW cooling per GP-8.5. This action is called out of step DW/T-5.
DISTRACTOR (A)	**Vent the Drywell per OT-101 Attachment 3 is wrong.** Venting the drywell is a plausible action as it would have the intended result of lowering DW pressure and with the DW isolation signal, the rad reading would be steady, ie. not changing. This action is not directed at this time and venting the drywell is not normally directed unless DW integrity is threatened.(PC/P-10)
DISTRACTOR (C)	**Spray the Drywell with 1A RHR per T-225 section 4.7 is wrong:** Plausible answer as this drywell pressure would quickly respond to DW spray and pressure would rapidly lower. The drywell pressure of 7.6 psig is above the value of 7.5 psig in step PC/P-6 to continue to the spray step. Step PC/P-6 refers to suppression pool press, however. Table PC/P-1 makes clear that SP pressure is the preferred pressure and should be used for decision making. T-102 step PC/P-6 is a stop sign which prevents passing until SP pressure is greater than 7.5 psig. Therefore, DW spray is not authorized at this time.
DISTRACTOR (D)	**Spray the Suppression Pool with RHRSW per T-225 section 4.3 is wrong:** Plausible option as section 4.3 of T-225 is provided to spray the SP. RHRSW is only available to Unit 1 through the B RHR system. therefore, the same loss of power to the B RHR valves would prevent this use.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 82 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	4.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2502984
Version ID:	3194328
User-Defined ID:	Q #82 NEW
Cross Reference Number:	CLOSED
Topic:	SRO Only RHR SP Spray Power Loss
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	None
SRO-Only Justification	This is SRO
Additional Information	None

General Data	
Level	SRO
Tier	2
Group	2
KA # and Rating	230000A2.05 / 3.8
KA Statement	(230000A2.05) Ability to (a) predict the impacts of the following on the (SF5 RHR SPS) RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) AC electrical failures
Cognitive level	High
Safety Function	5
10 CFR 55	CFR: 41.5 / 45.6
Technical Reference with Revision No:	T-102 Rev028 T-225 U/1, Rev. 26
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS1103.3 LGSOPS0093.5

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

83 **ID: 2490582** **Points: 1.00**

**********SRO ONLY**********

An UNISOLABLE Primary System leak on Unit 1 HPCI has resulted in the following:

- 109-E1, "1 Reac Encl / Refuel Flr Vent Exhaust Rad Mon A/B Hi-Hi / Downscale" in alarm
- Reactor Enclosure HVAC Radiation level is 2.7 mR/h
- 107-G2, “DIV 2 Steam Leak Detection System Hi Temp /Trouble in alarm
- Security reports steam escaping from the Blow Out panel above the Diesel Generator

Dose assessment using actual meteorology indicates the following beyond the site boundary:

- 55 mRem TEDE
- 125 mRem CDE Thyroid

Readings on the North Stack WRAM Rad Monitor for the last 20 minutes:

North Stack WRAM 2.01 E+06 µCi/sec

WHICH ONE of the following is the highest Emergency Classification for the given conditions?

A. FA1

B. RA1

C. FS1

D. RS1

Answer: C

Answer Explanation

ANSWER (C)	**FS1 is correct.** With stem conditions and correct use of the references provided, one will identify that with secondary containment exhaust radiation above the isolation setpoint of 1.35 mR/hr, MNO has been exceeded per T-103. This represents a potential loss of the RC barrier on the Fission Product Barrier matrix. CT-6 barrier 1 states "Unisolable direct downstream pathway to the environment exists following a primary containment isolation signal. RAD levels in RE exhaust of >1.35 mr/hr are a secondary containment isolation signal and it is stated that the leak is UNISOLABLE".
DISTRACTOR (A)	**FA1 is wrong.** FA1 is plausible if the applicant does not recognize CT-6.1 threshold as exceeded and instead only looks for MSO RAD per CT-6.3.b. This requires correctly recalling from the entry conditions of T-103 that the isolation setpoint of 1.35 mR/hr is also an MNO.
DISTRACTOR (B)	**RA1 is wrong.** RA1 is plausible as it is a correct classification, but it is not the highest classification for the conditions given. RA1 is met based on North Stack WRAM of 2.01 E+06 µCi/sec which is above the Alert threshold of 1.92 E+06 µCi/sec. Additionally, Dose Assessment beyond the site boundary of 55 MRem TEDE and 125 mRem CDE Thyroid both constitute an alert
DISTRACTOR (D)	**RS1 is wrong.** RS1 is plausible as conditions given exercise aspects of the Abnormal Rad Levels / Radiological Effluents table, and there are multiple items that could be misinterpreted to meet the Site Area Emergency RS1 valves: including North Stack WRAM, Dose Assessment beyond the site boundary for TEDE and CDE Thyroid

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 83 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2490582
Version ID:	3195125
User-Defined ID:	Q #83 NEW
Cross Reference Number:	OPEN
Topic:	(SRO Only) EPE T-103 ventilation rad, knowledge of EPlan
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	EP-AA-1008 Addendum 3 page 2-1 and 2-3
K/A Justification	This question tests the candidate's ability to use Emergency Plan implementing procedures during a high secondary radiation condition.
SRO-Only Justification	To correctly answer this question, the candidate must possess knowledge of administrative procedures that specify implementation of plant emergency procedures. The candidate must then correctly use these procedures to arrive at the answer.
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	2
KA # and Rating	(295034) (G2.4.29) / 4.4
KA Statement	(EPE 11) SECONDARY CONTAINMENT VENTILATION HIGH RADIATION (G2.4.29) EMERGENCY PROCEDURES / PLAN Knowledge of the emergency plan implementing procedures (CFR: 41.10 / 43.5 / 45.11)
Cognitive level	High
Safety Function	9
10 CFR 55	CFR: 41.10 / 43.5 / 45.11
Technical Reference with Revision No:	EP-AA-1008 Add 3 Rev.07
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0076A.10

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

84 **ID: 2490713** **Points: 1.00**

**********SRO ONLY**********

A Core Spray Pump is out of service for maintenance. As part of the window, a corrective maintenance activity is scheduled.

It is determined that leads, which send an output signal from Core Spray, must be lifted to support the maintenance window.

- The leads will be relanded prior to exiting the maintenance window
- The maintenance window is scheduled for 6 days

Determine
(1) which process must be used to control the lifted leads, and
(2) whether a 50.59 review is required.

	(1)	(2)
A.	Maintenance Rule 10CFR50.65 (a)(4) Temporary Changes (MR90)	50.59 Review **not** required
B.	Maintenance Rule 10CFR50.65 (a)(4) Temporary Changes (MR90)	50.59 Review required
C.	Temporary Configuration Change Package (TCCP)	50.59 Review **not** required
D.	Temporary Configuration Change Package (TCCP)	50.59 Review required

Answer: A

Answer Explanation

Temporary Configuration change package is plausible as the activity described is certainly "temporary" at 6 days. This process is used to address a non-conforming change to the approved design to address system degradation, temp. repairs or one time evolutions. This process is documented in the TCCP for the change to the form, fit or function of SSCs.

ANSWER (A)	**Maintenance Rule 10CFR50.65 (a)(4) Temporary Changes (MR90), 50.59 Review not required is correct:** Maintenance Rule is for temp changes in direct support of maintenance activities as described in 50.59 resource manual. The MR90 suffix describes the requirement to complete the work in less than 90 days. If the work were to exceed 90 days, a 50.59 review would be required. Therefore, corrective maintenance scheduled for 6 days would fall under the MR90 main. rule. with no 50.59 review.
DISTRACTOR (B)	**Maintenance Rule 10CFR50.65 (a)(4) Temporary Changes (MR90), 50.59 Review required is wrong:** Performing a 50.59 review is plausible as this would be required for system changes affecting nuclear safety and lasting longer than 90 days. As described in the Temp Change procedure, CC-AA-112, however, if the process falls under the MRULE (MR90), no 50.59 review is required when the change is removed in under 90 days.
DISTRACTOR	**Temporary Configuration Change Package (TCCP), 50.59 Review not required is wrong:** TCCP is plausible because lifting leads is a temporary change and could lead the novice candidate to select that option. As noted above, the MR90 rule is the applicable controlling process for short term "work orders and procedures" which will be completed in under 90 days.
DISTRACTOR	**Temporary Configuration Change Package (TCCP), 50.59 Review required is wrong:** TCCP is plausible because lifting leads is a temporary change and could lead the novice candidate to select that option. As noted above, the MR90 rule is the applicable controlling process for short term "work orders and procedures" which will be completed in under 90 days which also 50.59 review is plausible as noted previously for nuclear safety related equipment but not for MR90 activities lasting less than 90 says.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 84 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2490713
Version ID:	3185708
User-Defined ID:	Q #84 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) LPCS, 50.59
Num Field 1:	LM
Num Field 2:	SRO-LOW
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires the candidate to differentiate between controlling processes within the Temporary Configuration Control Process, as well as to correctly implement the 90 day requirement of the MRule as it relates to 50.59. All of this is within the context of maintenance on the Core Spray system.
SRO-Only Justification	This is at the SRO level as it tests administrative processes for temporary modifications
Additional Information	N/A

General Data	
Level	SRO
Tier	2
Group	1
KA # and Rating	(209001) (G2.2.5) / 3.2
KA Statement	(209001) (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM (G2.2.5) EQUIPMENT CONTROL Knowledge of the process for making design or operating changes to the facility, such as 10 CFR 50.59, “Changes, Tests and Experiments,” screening and evaluation processes, administrative processes for temporary modifications, disabling annunciators, or installation of temporary equipment (CFR: 41.10 / 43.3 / 45.13)
Cognitive level	Low
Safety Function	2
10 CFR 55	CFR: 41.10 / 43.3 / 45.13
Technical Reference with Revision No:	CC-AA-112 Rev 30
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS2005A.18

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

85 **ID: 2494601** **Points: 1.00**

**********SRO ONLY**********

Unit 1 is experiencing an Instrument Air leak:

- Both Instrument Air Headers are approaching 60 psig

A plant shutdown is required to prevent an undesirable consequences of lowering air pressure related to:

1) Which system component failing open

AND

2) The related procedure entry for the component failing open?

	(1) System component	(2) Procedure
A.	Reactor Feed Pump Minimum Flow Valves	OT-100 REACTOR LOW LEVEL
B.	Feedwater Heater Dump Valves	OT-104 UNEXPECTED/UNEXPLAINED POSITIVE OR NEGATIVE REACTIVITY INSERTION
C.	CRD HCU Scram Valves	ON-104 CONTROL ROD PROBLEMS
D.	Air Ejector Discharge Valves	OT-116 LOSS OF CONDENSER VACUUM

Answer: C

Answer Explanation

ANSWER (C)	**CRD HCU Scram Valves; ON-104 CONTROL ROD PROBLEMS** is correct. ON-119, "Loss of Instrument Air" step 2.3.2 requires a GP-4 "Rapid Plant Shutdown to Hot Shutdown" if both Instrument Air Header pressures are less than 60 psig. The ON-119 bases document states the reason for this step is "Scram inlet and outlet valves are expected to start opening below 55 psig in the instrument air headers. A GP-4 shutdown should be performed before control rods begin to drift in order to avoid an undesirable core power distribution." While OT-104 would give direction in the case of rod drifts, it is appropriate to act prior to that condition.
DISTRACTOR (A)	**Reactor Feed Pump Minimum Flow Valves; OT-100 REACTOR LOW LEVEL** is wrong. This is plausible, since per ON-119 step 2.3.4, the valves do fail open on a loss of Instrument Air, which would result in adverse impacts on Reactor Level.
DISTRACTOR (B)	**Feedwater Heater Dump Valves; OT-104 UNEXPECTED/UNEXPLAINED POSITIVE OR NEGATIVE REACTIVITY INSERTION** is wrong. This is plausible, since per ON-119 step 2.3.6, the valves do fail open on a loss of Instrument Air, which would result in adverse impacts on Reactor Power.
DISTRACTOR (D)	**Air Ejector Discharge Valves; OT-116 LOSS OF CONDENSER VACUUM** is wrong. This is plausible, since per ON-119 step 2.3.8, the valves do fail open on a loss of Instrument Air, which would result in adverse impacts on Main Condenser Vacuum.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 85 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2494601
Version ID:	3194330
User-Defined ID:	Q #85 BANK LAST 2 EXAMS
Cross Reference Number:	CLOSED
Topic:	(SRO Only) Loss of Instrument Air
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question asks the candidate to determine the impacts of low instrument air pressure during a loss or partial loss of instrument air.
SRO-Only Justification	This question tests at the SRO level because detailed knowledge of the procedure is required, as well as assessment of plant conditions (abnormal) and then prescribing a procedure or section of a procedure to mitigate or recover or with which to proceed.
Additional Information	This question was used on last year's NRC Exam as question #93 (SRO Only), and has been removed from the certification (audit) exam to prevent overlap.

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	295019AA2.01 / 3.9
KA Statement	(295019AA2.01) Ability to determine or interpret the following as they apply to (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: (CFR: 41.10 / 43.5 / 45.13) Instrument air pressure
Cognitive level	High
Safety Function	8
10 CFR 55	CFR: 41.10 / 43.5 / 45.13
Technical Reference with Revision No:	ON-119 rev 35
Question History: (i.e. LGS NRC-05)	LGS 2022 NRC for ILT 21-1
Question Type: (New, Bank, Modified)	Bank
Revision History:	Bank
Training Objective	LGSOPS3000.LGSOPS1550.2

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

86 **ID: 2504705** **Points: 1.00**

************SRO ONLY************

Unit 2 is operating at rated power

5 minutes later the following conditions exist:

- All control rods indicate full in
- A steam leak has occurred at the main turbine
- Main Steam Line radiation monitors indicate 10,100 mr/hr rising slowly
- Offgas radiation monitor rad levels are rising slowly
- The Emergency Director has declared Emergency Action Level (RA1) with a Release In Progress

WHICH ONE of the following actions is required?

A. Close the MSIVs in accordance with T-104, Radioactivity Release Control

B. Close the MSIVs in accordance with T-103, Secondary Containment Control

C. Emergency Depressurize the RPV in accordance with T-104, Radioactivity Release Control

D. Emergency Depressurize the RPV in accordance with T-103, Secondary Containment Control

Answer: A

Answer Explanation	
ANSWER (A)	**Close the MSIVs in accordance with T-104, Radioactivity Release Control; Correct:** With an unisolated steam leak in the turbine enclosure, a radioactive release occurs. T-104 entry condition is for rad release above the ALERT level per EP-AA-1008 Add. 3. T-103 entry condition is 1.5X normal full power background which is approximately 1600 mr/hr. At 12,500 mr/hr, T-101 is entered and SCC/RAD-5 would direct closing the MSIVs T-104 step RR-5 directs the isolation of all primary systems discharging outside of secondary containment which includes MSIVs
DISTRACTOR (B)	**Close the MSIVs in accordance with T-103, Secondary Containment Control; Incorrect:** Plausible because T-103 also directs the closing of MSIVs. T-103 directs operators to close MSIVs when MSL rad level reaches 12,500 mr/hr. The candidate could conclude this level was at the 10,000 mr/hr rad level which is common MSO to all the Rad Monitors.
DISTRACTOR	**Emergency Depressurize the RPV in accordance with T-104, Radioactivity Release Control; Incorrect,** Plausible, because T-104 RR-9, directs a blowdown on rising Release Rates before exceeding the GE level. This level has not even been approached and MSIVs should be isolated first
DISTRACTOR	**Emergency Depressurize the RPV in accordance with T-103, Secondary Containment Control; Incorrect:** Plausible, if the applicant determines that Rad Levels greater than 10,000mr/Hr (MSO) indicates that a blowdown is required which is MSO for all Rad Indications. T-103 does not direct a blowdown until MSO exceeded in more than one area however.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 86 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504705
Version ID:	3194476
User-Defined ID:	Q #86 NEW
Cross Reference Number:	CLOSED
Topic:	SRO- Only T-104 Action for Monitored Release
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	This question requires the SRO to direct action to control radiation releases by closing the MSIVs
SRO-Only Justification	This question requires the SRO candidate to recognize the plant conditions and select from multiple procedures and steps to determine the correct course of action for a high radiation condition
Additional Information	N/A

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	(G2.3.11) / 4.3
KA Statement	(G2.3.11) Ability to Control Radiation Releases
Cognitive level	High
Safety Function	9
10 CFR 55	CFR: 43.4 / 45.10
Technical Reference with Revision No:	T-103 Rev.025 T-104 Rev.014
Question History: (i.e. LGS NRC-05)	
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0048.10

87 **ID: 2491102** **Points: 1.00**

**********SRO ONLY**********

During normal power operations, the Unit 2 RO is performing increased frequency monitoring due to a degraded 2A Reactor Recirc Pump Seal #1.

- At 02:35, ARC-MCR-211-A1, 2A RECIRC PUMP SEAL STAGE HI/LO FLOW alarms.

Monitoring yields the following results:

Time	2A1 Seal Pressure	2A2 Seal Pressure	D/W FLR DRN SUMP FLW 2 MIN AVG E2192FL2	D/W EQP DRN SUMP FLOW 2 MIN AVG E2193FL2
02:20	1030 psig	580 psig	0.2 gpm	1.7 gpm
02:25	1030 psig	800 psig	0.2 gpm	1.8 gpm
02:30	1030 psig	1030 psig	0.2 gpm	1.9 gpm
02:35	1010 psig	1010 psig	0.2 gpm	16 gpm
02:40	950 psig	950 psig	0.3 gpm	26 gpm
02:45	930 psig	930 psig	0.3 gpm	29 gpm
02:50	905 psig	905 psig	0.3 gpm	32 gpm
02:55	900 psig	900 spig	0.3 gpm	32 gpm
03:00	898 psig	900 psig	0.3 gpm	32 gpm

When is the **latest** that EAL MU6 must be declared?

A. 02:35

B. 02:45

C. 02:50

D. 02:55

Answer: D

Answer Explanation

ANSWER (D)	**02:55 is correct.** EAL MU6 threshold 2 must be declared with "RCS identified leakage in the Drywell > 25 gpm for > 15 minutes." This requires the candidate to first correctly classify the leakage as IDENTIFIED per TS definition 1.16.a: "IDENTIFIED LEAKAGE shall be: a. Leakage into collection systems, such as pump seal or valve packing leaks, that is captured and conducted to a sump or collecting tank." The candidate must also correctly interpret when 15 minutes has expired, as this is the latest the classification may be made. In the stem conditions given, 25 gpm is first exceeded at 02:40, therefore 15 minutes will have elapsed at 02:55.
DISTRACTOR (A)	**02:35 is wrong.** This is plausible because EAL MU6 threshold 1 requires "RCS unidentified or pressure boundary leakage in the Drywell > 10 gpm for > 15 minutes," and the type of leakage must be determined by the candidate. This is also plausible because the note in EAL MU6 states "The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded." Leakage will likely exceed 15 minutes due to the conditions given (seal leakage, which will not improve). However, the questions asks for the latest that MU6 must be declared, not the earliest.
DISTRACTOR (B)	**02:45 is wrong.** This is plausible because EAL MU6 threshold 1 requires "RCS unidentified or pressure boundary leakage in the Drywell > 10 gpm for > 15 minutes," and the type of leakage must be determined by the candidate. This answer would be correct for unidentified leakage.
DISTRACTOR (C)	**02:50 is wrong.** This is plausible because the note in EAL MU6 states "The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded or will likely be exceeded." Leakage will likely exceed 15 minutes due to the conditions given (seal leakage, which will not improve). However, the questions asks for the latest that MU6 must be declared, not the earliest.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 87 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2491102
Version ID:	3185717
User-Defined ID:	Q #87 NEW
Cross Reference Number:	OPEN
Topic:	(SRO Only) E-Plan trends
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	EP-AA1008 Addendum 3 sheet 2-7
K/A Justification	This question requires the candidate to accurately characterize the type of leakage (identified), trend the leakage against an EAL threshold, then make a timely classification.
SRO-Only Justification	This is at the SRO level because it requires knowledge of decision points within the facility's emergency plan. This includes specifically emergency action level declarations.
Additional Information	Although the breakdown bushings on the Recirc Pumps are designed to limit flow to 20 gpm, UFSAR section 1.13 states (while discussing loss of cooling water to recirc pump seals) "Even in the remote case where neither cooling source is reestablished and gross seal degradation occurs, the GE analysis performed under the direction of the BWROG has shown that the maximum coolant loss would be limited to 70 gpm per pump... It should be noted that since the initial licensing of the LGS Units, an improved seal design, prone to even less leakage in the event of failure, has been installed on the pumps."

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	G2.4.47 / 4.2
KA Statement	(G2.4.47) EMERGENCY PROCEDURES / PLAN Ability to diagnose and recognize trends in an accurate and timely manner using the appropriate control room reference material (reference potential) (CFR: 41.10 / 43.5 / 45.12)
Cognitive level	High
Safety Function	N/A
10 CFR 55	CFR: 41.10 / 43.5 / 45.12
Technical Reference with Revision No:	EP-AA-1008 Adendum 3 Rev 7
Question History: (i.e. LGS NRC-05)	New

	Question Type: (New, Bank, Modified)	New
	Revision History:	New
	Training Objective	LGSOPS1800.9

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

88 **ID: 2490712** **Points: 1.00**

**********SRO ONLY**********

Unit 1 is operating at 100% Reactor Power.

- 1A CRD pump is in service
- 1B Main Control Room Chiller is in service

The following alarms are received;

- 121-G2, "1PPC1/1PPC3 125V DC DIST PANELS UNDERVOLTAGE"
- 124-G3, "1PPC2 125V DC DIST PANEL UNDERVOLTAGE"

Which procedure or section must be performed?

A. ON-107,"Control Rod Drive System Problems", Attachment 1, "CRD Pump Trip" due to the trip of 1A CRD pump

B. E-1FC, Loss of Division III Safeguard 125V DC Bus 1FC, Attachment **2**, "Manual Initiation of Control Room Chlorine Isolation" due to CREFAS re-alignment

C. E-1FC, Loss of Division III Safeguard 125V DC Bus 1FC, Attachment **3**, "Reset of MSIV and RWCU Isolations" due to MSL drain re-alignment

D. S87.7.A, "Control Room HVAC System Restoration From An Isolation", Section 4.3, "Restoration To Normal Operation" to reset all isolation signals

Answer: B

Answer Explanation

ANSWER (B)	**E-1FC, Loss of Division III Safeguard 125V DC Bus 1FC, Attachment 2, "Manual Initiation of Control Room Chlorine Isolation" due to CREFAS re-alignment is correct.** On a loss of Div 3 DC power, the Control Room Fresh Air system will partially isolate and if it is Div 3 or 4, a CREFAS (Emergency) fan will start. The partial isolation is undesirable as there may not be proper flowpath established. Therefore the attachment 2 of E-1FC directs the proper initiation of a Chlorine isolation.
DISTRACTOR (A)	**ON-107,"Control Rod Drive System Problems", Attachment 1, "CRD Pump Trip" due to the trip of 1A CRD pump is wrong:** This is a plausible answer due to the fact that while 1A CRD pump is AC powered, a candidate may infer that a loss of DC control power could adversely affect the pump, causing a flowpath error similar to the MCR chiller. In fact, the loss of Div 3 DC only prevents the tripping of the pump remotely but will not cause operational difficulties otherwise.
DISTRACTOR (C)	**E-1FC, Loss of Division III Safeguard 125V DC Bus 1FC, Attachment 3, "Reset of MSIV and RWCU Isolations" due to MSL drain re-alignment is wrong.** This is plausible because a loss of Division 3 DC would result in loss of power to the Div 3 DC portion of NSSSS and the potential for an isolation signal when the SLD numac transfers to backup power source. Attachment 3 is only performed if an actual isolation occurred. This is not a normal plant response to the loss of power and would only occur is another pre-existing fault were in place.
DISTRACTOR (D)	**S87.7.A, "Control Room HVAC System Restoration From An Isolation", Section 4.3, "Restoration To Normal Operation" to reset all isolation signals is wrong:** Following the loss of Div 3 DC, CREFAS will realign as noted above. It is plausible to the candidate, that Resetting the isolation is a required task as this the action required following an AC power interruption such as a bus transfer or LOCA signal. But, as noted above, with a DC power loss, the system must be aligned to complete the isolation and cannot be reset.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 88 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2490712
Version ID:	3194333
User-Defined ID:	Q #88 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) APE Loss of DC, system lineups
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question asks the candidate to determine the system alignment of CREFAS, and the actions required to restore the system to a functional alignment on a loss of divisional DC power.
SRO-Only Justification	This question tests at the SRO level because it requires the candidate to assess the impact on the plant of an emergency, and then to direct procedural actions to mitigate the effects of the emergency.
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	295004AA2.04 / 3.5
KA Statement	(295004AA2.04) Ability to determine or interpret the following as they apply to (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER: (CFR: 41.10 / 43.5 / 45.13) System lineups
Cognitive level	High
Safety Function	6
10 CFR 55	CFR: 41.10 / 43.5 / 45.13
Technical Reference with Revision No:	E-1FC Rev 19
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0078.7

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

89 **ID: 2504026** **Points: 1.00**

**********SRO ONLY**********

Unit 2 experienced a LOCA.

Drywell pressure peaked at 21 psig

Drywell spray has been initiated.

- Reactor Level is being maintained with HPCI
- Current Drywell Pressure is 0.5 psig down fast.
- Current Reactor pressure is 140 psig down slow
- Suppression Pool level is 26.5 ft up slow
- Suppression Pool Temperature is 111 °F

What action is required to be directed?

A. Secure HPCI

B. Secure Drywell Spray

C. Swap Drywell Spray to an internal suction source

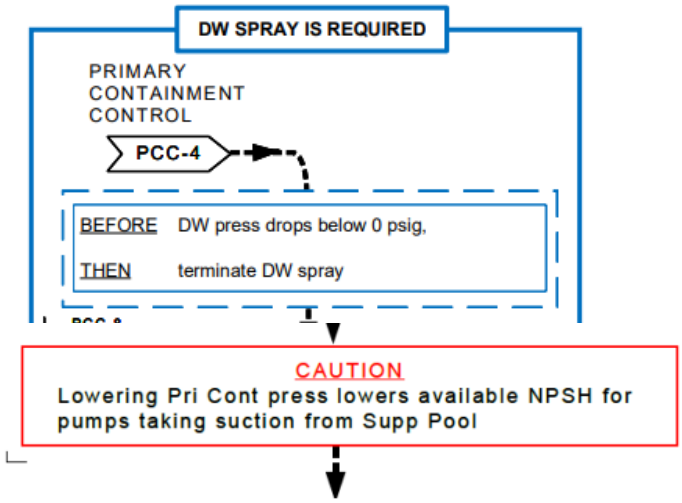
D. Initiate S/D cooling using ONLY those RHR pumps not required to maintain RPV in band

Answer: B

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation



The caution listed above from PCC-2 warns against lowering primary containment pressure excessively when using pumps with a SP suction such as HPCI. This would be another reason to limit de-pressurization.

ANSWER (B)	**Secure Drywell Spray is correct.** T-102 step PC/P-4 states: "IF Pri Cont press drops below 0 psig, THEN control Pri Cont press above -5 psig exceeding offsite release rate limits if necessary." And step PCC-8 states "BEFORE DW press drops below 0 psig, THEN terminate DW spray." These two notes make the point that it is undesirable to let pressure go negative and imperative to maintain it above -5 psig. Anything less than that risks exceeding design limits and breaking the containment. Also, the caution above on NPSH would argue for limiting depressurization when running RHR and HPCI
DISTRACTOR (A)	**Secure HPCI is wrong.** A Plausible answer for the following reasons: 1) T-102 step SP/T-5 states: "BEFORE Supp Pool temp reaches 110°F, enter T-101 AND execute concurrently" This indicates that 110°F is a limiting temperature for the suppression pool. 2) TS 3.6.2.1.a.2.b) lists 110°F as a limit for power operation. And 3) HPCI operational testing requires HPCI to be shutdown when suppression pool temperature exceeds 105°F. In this scenario, if HPCI is required to maintain level, it would not be secured and the 110°F limit is an OPCON 1 limit.
DISTRACTOR (C)	**Swap Drywell Spray to an internal suction source is wrong.** T-102 requires internal spray to be selected per step PCC-9 only when the "SAFE side of PCPL curve CANNOT be restored AND maintained." The containment parameters given are within the normal DBA LOCA response, which will not exceed PCPL. From UFSAR 15.6.5.4, Barrier Performance: "The primary containment is designed to maintain pressure integrity in the event of an instantaneous rupture of the largest single primary system piping within the structure while also accommodating the dynamic effects of the pipe break. Therefore, any postulated LOCA would not exceed the containment design limit." This

	distractor is plausible because Suppression Pool Level is above normal limits of both Tech Specs and T-102, which would require mitigative actions (but would not require cessation of external injection).
DISTRACTOR (D)	**Initiate S/D cooling using ONLY those RHR pumps not required to maintain RPV level above +12.5" is wrong.** This is wrong because T-101 steps RC/P-9 and -10 state: "WHEN RPV press less than 75 psig AND further cooldown required, THEN Initiate S/D cooling using ONLY those RHR pumps not required to maintain RPV level above +12.5"." RPV pressure is 140 psig in the stem, and shutdown cooling operation is not required or available. This is plausible because RPV pressure in the of 140 psig is a valid pressure for SDC if the plant is in T-111, "Level Restoration, Steam Cooling" and further cooldown is required due to the LOCA condition. But in T-102, pressure must be below 75 psig.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 89 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504026
Version ID:	3194337
User-Defined ID:	Q #89 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) Hi DW Press EPE, notes and cautions
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires the candidate to recall the information contained in a caution and notes in T-102, Primary Containment EOP for containment spray, and apply it to a set of plant conditions.
SRO-Only Justification	This question is at the SRO level because it requires the candidate to assess plant conditions (emergency) and then prescribe a section of a procedure to mitigate or recover or with which to proceed. This also requires detailed procedure knowledge beyond the general progression of an event.
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	(295024) (G2.4.20) / 3.8
KA Statement	(295024) (EPE 1) HIGH DRYWELL PRESSURE EMERGENCY PROCEDURES/PLAN (G2.4.20) Knowledge of the operational implications of emergency and abnormal operating procedures warnings, cautions, and notes (CFR: 41.10 / 43.5 / 45.13)
Cognitive level	High
Safety Function	2
10 CFR 55	CFR: 41.10 / 43.5 / 45.13
Technical Reference with Revision No:	T-225 U/2 Rev 26 T-101 Rev 28 T-102 Rev 29
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS1560.6

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

90 **ID: 2491111** **Points: 1.00**

**********SRO ONLY**********

Consider the following with regards to FH-105 "Core Component Movement – Core Transfer":

1. Minimum water coverage of 8 ft over active fuel with refuel platform at Normal Up verified
2. At least 4 SRM channels are operable and inserted to normal operating level
3. All control rods fully inserted
4. Refuel Platform Main Hoist Load Cell Testing for Handling Alteration Test has been performed prior to the start of Core Alterations

Which of the above are required by FH-105 prior to commencing core alterations?

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: D

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

Discussion of distractors with regards to FH-105 and Tech Specs

1. Minimum water coverage of 8 ft over active fuel with refuel platform at Normal Up verified

   - **This is Correct**: FH-105 prerequisites require verification of Tech Spec 4.9.6.1 minimum water coverage of 8 ft of water over active fuel with refuel platform at Normal Up

2. At least 4 SRM channel are operable and inserted to normal operating level

   - **This is NOT Correct**:
     - FH-105 prerequisite requires verification that the SRM operability requirements of Tech Spec 3.9.2 are maintained.
   - Tech Spec 3.9.2 states:
     - At least two source range monitor (SRM) channels* shall be OPERABLE and inserted to the normal operating level
   - **This is Plausible as**: Tech. Specs. 3.9.2, includes additional requirements, including one of the required SRM detectors located in the quadrant where CORE ALTERATIONS are being performed and the other required SRM detector located in an adjacent quadrant. During refueling it is optimal to have all 4 SRMs operable, allowing bridge operation in each quadrant to support fuel move patterns, but it not required.

3. All control rod fully inserted

   - **This is NOT Correct**:
     - FH-105 requires all control rods must be fully inserted prior to loading a fuel assembly in the associated control cell. This requirement is specific core reload and does not apply to commencing Core alterations
     - Tech Spec 3.9.3 states All control rods shall be inserted, but allow for withdrawal of one control rod may under control of the reactor mode switch Refuel position one-rod-out interlock.
   - **This is plausible:** Both the FH-105 requirement and Tech Spec requirements as read directly may be misinterpreted to not allow for the use of the “one-rod-out” interlock

4. Refuel Platform Main Hoist Load Cell Testing for Handling Alteration Test have been performed prior to the start of Core Alterations

   - **This is Correct**: FH-105 prerequisites require performance of ST-6-097-630- Refuel Platform Main Hoist Load Cell Testing for Handling Alteration Test have been performed prior to the start of Core Alterations

ANSWER (D)	**1 and 4 is correct: See above**
DISTRACTOR (A)	**1 and 2 is wrong. See above**
DISTRACTOR (B)	**2 and 3 is wrong. See above**
DISTRACTOR (C)	**3 and 4 is wrong. See above**

Test Answer Key

Final SRO exam 11-27-23

Test ID: 374893

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 90 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2491111
Version ID:	3194547
User-Defined ID:	Q #90 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) knowledge of spent fuel movement procedures
Num Field 1:	LM
Num Field 2:	SRO-LOW
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires a working knowledge of FH-105 CORE COMPONENT MOVEMENT - CORE TRANSFERS. This is a spent fuel movement procedure.
SRO-Only Justification	This is written at the SRO level because it requires knowledge of TS bases that is required to analyze TS required actions and terminology.
Additional Information	N/A

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	G2.1.42
KA Statement	(G2.1.42) CONDUCT OF OPERATIONS Knowledge of new and spent fuel movement procedures (SRO Only) (CFR: 43.7 / 45.13)
Cognitive level	Low
Safety Function	N/A
10 CFR 55	CFR: 43.7 / 45.13
Technical Reference with Revision No:	FH-105 rev 54 TSB 3/4.9 Ammendment ECR 06-00389
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0097.5 and .13

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

91 **ID: 2504068** **Points: 1.00**

**********SRO ONLY*********

Both Units are at 100% power when the following occurs:

- A Loss of All Offsite Power occurs

1 minute later plant status is as follows:

- All Unit 1 Diesel Generators have failed to start
- Unit 1 Reactor level is -40" and rising
- Unit 1 HPCI and RCIC are running and injecting
- All MSIVs have closed
- All blue scram lights are lit
- Reactor power is 5% and steady
- SRVs are auto cycling open and closed

WHICH ONE of the following describes 1) the instrument that can be used to determine Unit 1 Reactor pressure per E-1, Station Blackout, and 2) what action will be directed?

	Instrument Used	Action Directed
A.	RCIC Steam Pressure, PI-49-1R602	Manually lower pressure to 990 psig
B.	RCIC Steam Pressure, PI-49-1R602	Direct EO to perform T-214, "Manual Initiation of ARI"
C.	"A" PAMS, XR-42-1R623A	Manually lower pressure to 990 psig
D.	"A" PAMS, XR-42-1R623A	Direct EO to perform T-214, "Manual Initiation of ARI"

Answer: A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

The Station Blackout is described in section 15.12 of the LGS USFAR Chapter 15 - Accident Analysis.

Station blackout is addressed by Limerick procedure E-1, Loss of all AC Power (Station Blackout)

During a station blackout very few instruments remain available for monitoring the reactor during the accident. They are identified by E-1.

From E-1 BASES

3.3 **MONITOR** plant parameters using available instrumentation listed in Attachment 1. _____

3.3.1 **IF** critical DC powered instruments are not available, **THEN** implement appropriate section of T-370 to establish alternate monitoring methods. _____

The following RPV pressure instruments are available during a station blackout:
PI-42-*R605 WR
PI-55-*R602 HPCI (available)
PI-49 *R602 RCIC (available)

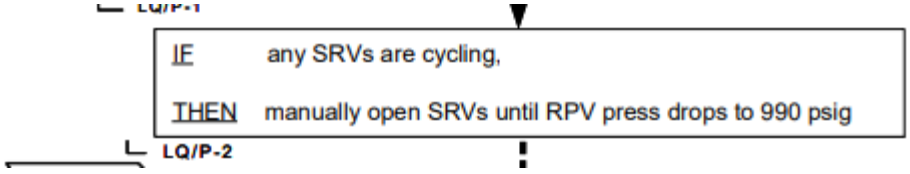
_____

ATTACHMENT 1
Page 2 of 2

INSTRUMENTATION AVAILABLE DURING STATION BLACKOUT
WITH LOSS OF ALL DIESELS

INSTRUMENT NUMBER	DESCRIPTION	LOCATION
PI-49-*R602	"RCIC Turbine Steam Pressure" (PX) (Reactor Pressure)	*0C648 RCIC
PI-50-*R604	"RCIC Pump Suction Pressure" (PX)	
PI-49-*R601	"RCIC Pump Discharge Pressure" (PX)	
PI-50-*R603	"RCIC Turbine Exhaust Pressure" (PX)	
FI-49-*R600-1	"RCIC Pump Flow" (FL)	
SI-50-*01-1	"RCIC Turbine Speed" (S)	

From T-117



ANSWER (A)	**RCIC Steam Pressure, PI-49-1R602, Manually lower pressure to 990 psig is correct:** As noted above in the table, RCIC steam

	pressure on PI-49-1R602 is a valid reading for Rx pressure when AC power is unavailable. "A" PAMS indicator is powered from a safeguard AC bus but without a running EDG, it has no power on a complete LOOP. Because the reactor did not shutdown as evidenced by power at 5%, entry into T-117 would be required. T-117 step LQ/P-2 directs manually opening SRVs to lower pressure to 990 psig to minimize the possibility of the valves sticking open.
DISTRACTOR (B)	**RCIC Steam Pressure, PI-49-1R602, Manually initiate Alternate Rod Insertion is wrong:** Alternate Rod Insertion is plausible as an action to use during an ATWS as it activates the backup scram valves to assist in Rod insertion. However, because the Rx power has lowered to 5% in the stem, RPS and ARI have already initiated on low level (-38") as indicated by blue scram lights. Therefore, this would be an ineffective action to take.
DISTRACTOR (C)	**"A" PAMS, XR-42-1R623A, Direct EO to perform T-214, "Manual Initiation of ARI"is wrong:** Alternate Rod Insertion is plausible as an action to use during an ATWS as it activates the backup scram valves to assist in Rod insertion. However, because the Rx power has lowered to 5% in the stem, RPS and ARI have already initiated on low level (-38") as indicated by blue scram lights. Therefore, this would be an ineffective action to take.
DISTRACTOR (D)	**"A" PAMS, XR-42-1R623A, Direct EO to perform T-214, "Manual Initiation of ARI" is wrong:** Plausible because the "A" PAMS is a EQ Post Accident indicator, but t it loses power on a Station Blackout. Also as noted above, Alternate Rod Insertion is plausible as an action to use during an ATWS as it activates the backup scram valves to assist in Rod insertion. However, because the Rx power has lowered to 5% in the stem, RPS and ARI have already initiated on low level (-38") as indicated by blue scram lights

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 91 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504068
Version ID:	3195074
User-Defined ID:	Q #91 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) Determine RPV pressure instr. available during a Station Blackout and Required Actions
Num Field 1:	LM
Num Field 2:	SRO-LOW
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	This question requires the candidate to determine that in the stated stem conditions, Reactor Pressure will be rising and then interpret which action must be directed to mitigate the pressure rise
SRO-Only Justification	This question tests at the SRO level because it requires assessment of plant conditions (normal, abnormal, or emergency) and then prescribing a procedure or section of a procedure to mitigate or recover or with which to proceed
Additional Information	EOPs control High Reactor Pressure in T-101, unless one of several contingency procedures are in effect. In this question, ATWS RPV Control contingency procedure T-117 is in control of RPV Pressure in lieu of T-101, and all guidance for lowering reactor pressure is contained therein.

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	295025EA2.01 / 4.7
KA Statement	(295025EA2.01) Ability to determine or interpret the following as they apply to (EPE 2) HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13) Reactor pressure
Cognitive level	High
Safety Function	3
10 CFR 55	CFR: 41.10 / 43.5 / 45.13
Technical Reference with Revision No:	T-117 Rev 23
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS1560.6

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

92 **ID: 2491085** **Points: 1.00**

**********SRO ONLY**********

WHICH ONE of the following is required during Transient Response per OP-LG-103-102-1002, Strategies for successful Transient Mitigation?

A. An RO obtaining CRS permission prior to securing HPCI following automatic initiation

B. Shift Technical Advisor ensure identification of critical parameters

C. Shift Manager approval when action taken is necessary to prevent personal injury

D. An RO obtaining CRS permission to manually initiate RRCS during an ATWS

Answer: A

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Answer Explanation

ANSWER (A)	**An RO obtaining CRS permission prior to securing HPCI following automatic initiation is correct.** An RO obtaining CRS permission prior to securing HPCI is required because this represents defeating or overriding an automatic initiation of an ECCS component. OP-LG-103-102-1002 step 4.1.2.2.C states "Obtain Control Room Supervisor permission prior to defeating or overriding an automatic initiation of an ECCS component." Section 4.1.3.5 does note: "CRS permission is required prior to defeating/overriding an automatic initiation of ECCS or RCIC, with the following exceptions: □ The action is directed by an Emergency Operating Procedure (example: securing or defeating HPCI, RHR and Core Spray per T-270) □ The CRS has directed using ECCS or RCIC to control RPV level (this gives the RO the authority to take the required actions to keep level in the prescribed band) □ HPCI/RCIC minimization following an automatic initiation, with HPCI/RCIC not required for RPV level control (this will minimize the negative impact HPCI or RCIC will have on RPV level and pressure control, and the impact on reactor power if the reactor is not shutdown)" However, none of these exceptions are true in the given stem. Note that in this case, the RO may minimize HPCI without CRS permission; however, to secure HPCI, the operator will have to insert an isolation per S55.2.A due to an initiation signal being present on high drywell pressure.
DISTRACTOR (B)	**Shift technical advisor ensure identification of critical parameters is wrong.** Transient procedure OP-AA-103-102 step 4.2.2.4 , Determination and assignment of critical parameters, is a Control Room Supervisor responsibility. This is plausible as the STA provides input for determination of critical parameters, and provides the CRs and crew with estimated time to actions values on critical parameters per step 4.2.2.3
DISTRACTOR (C)	**Shift Manager approval when action taken is necessary to prevent personal injury is wrong.** Per OP-LG-103-102-1002 step 4.1.2.3.c Shift Manager approval is NOT required when action taken is necessary to prevent personal injury or to save a life. Plausible as OP-LG-103-102-1002 describes other actions not prescribed by procedures that do required Shift Manger approval, such as taking action outside of existing procedural guidance \ when action is necessary to protect equipment or stabilize the plant
DISTRACTOR (D)	**An RO obtaining CRS permission manually initiate RRCS during and ATWS is wrong.** OP-AA-103-102 step 4.4.4.7 discusses the RO action for an unsuccessful SCRAM, including initiating RRCs followed by report to the CRS per the hard card This is plausible because

	CRS permission is required prior to defeating or overriding an automatic initiation of an emergency systems .

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 92 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2491085
Version ID:	3195055
User-Defined ID:	Q #92 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) Manage MCR Crew during transients
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

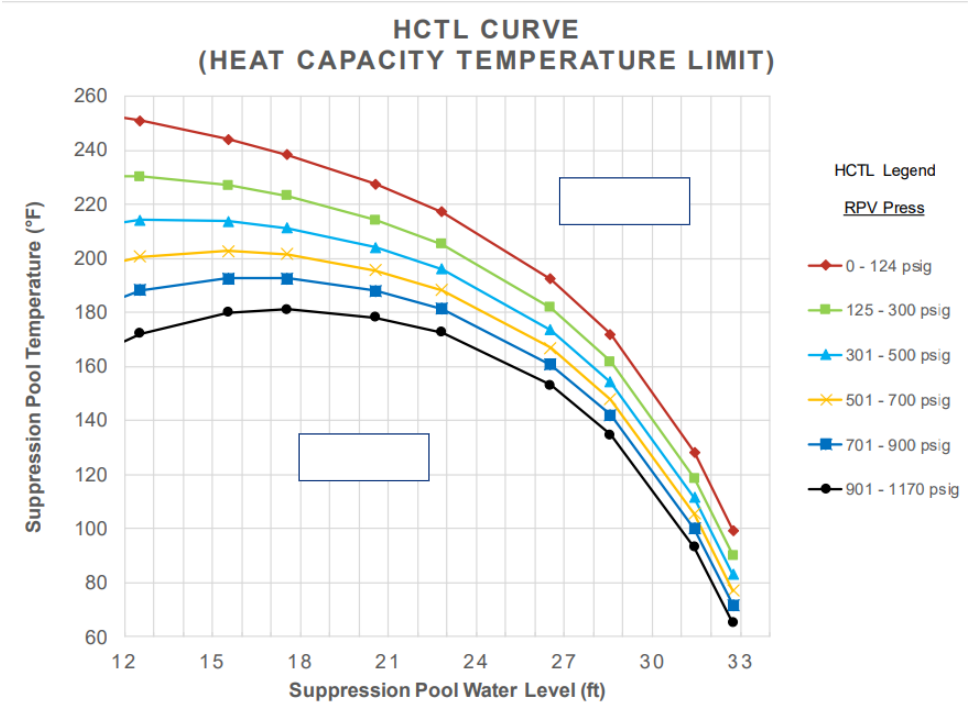
Comments:

References Provided	None
K/A Justification	This question asks the SRO Candidate to manage the crew by correctly identifying the changes in oversight of the operating crew during entry into EOPs
SRO-Only Justification	This tests at the SRO level because it requires knowledge of administrative procedures that specify implementation and coordination of plant normal and emergency procedures.
Additional Information	N/A

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	G2.1.6 / 4.8
KA Statement	(G2.1.6) CONDUCT OF OPERATIONS Ability to manage the control room crew during plant transients (SRO Only) (CFR: 43.5 / 45.12 / 45.13)
Cognitive level	High
Safety Function	N/A
10 CFR 55	CFR: 43.5 / 45.12 / 45.13
Technical Reference with Revision No:	OP-LG-103-102-1002 Rev 37
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LLOTS0050.2

93 **ID: 2507469** **Points: 1.00**

**********SRO ONLY**********



Plant conditions are as follows:

- D114-R-G Tripped on overcurrent
- Suppression Pool level is 24.0 ft
- Suppression Pool temperature is 170 °F up slow (1 °F/min)
- RPV pressure is being controlled between 800 and 900 psig with SRVs
- 1B RHR is operating in Suppression Pool cooling per S51.8.A

WHICH ONE of the following identifies the next required action?

A. Lower Suppression Pool level.per T-102, Primary Containment Control

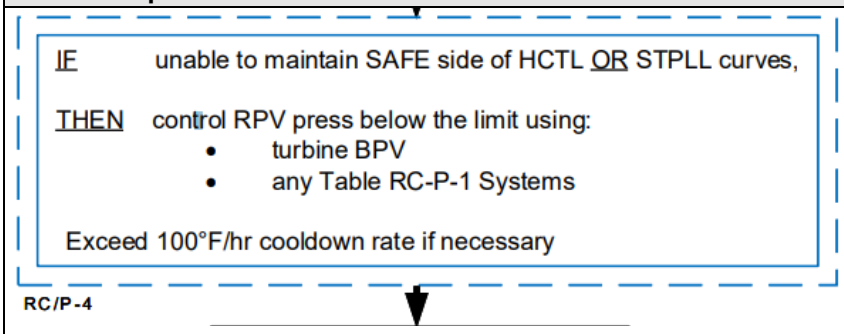
B. Control RPV pressure between 501 and 700 psig per T-101, RPV Control

C. Place 1A RHR in SP pool cooling per S51.8.A App. 1, U/1, "Placing RHR SP Cooling in Service During a Plant Event"

D. Emergency Blowdown per T-112, Emergency Blowdown

Answer: B

Answer Explanation



ANSWER (B)	**Control RPV pressure between 501 and 700 psig per T-101, RPV Control is Correct:** The SP temperature of 167°F at a level of 24 feet is above the curve for 901-1170 psig but it is below the curve for 701-900 psig. This means that the plant is still operating on the safe side of the HCTL curve. Actions that keep the plant on the safe side are allowed to forestall the need for a Blowdown. Lowering pressure into the next lower band is a step directed in T-101 PC/P-4 (above) to maintain operation on the safe side.
DISTRACTOR (A)	**Lower Suppression Pool level per T-102, Primary Containment Control; Wrong:** Plausible to the candidate who correctly determines from the operating point of the curve, that lowering level would increase the distance from the operating point to the most limiting pressure curve. This would allow more temperature increase. A SP water level >24.25 ft. would allow entry into the High SP level leg which would direct actions to lower level in SP/L-10. However, this is not directed by any trip for the given conditions as level at 24 ft is below the entry value and is such a slow process that it would be ineffective in preventing exceeding HCTL
DISTRACTOR (C)	**Place 1A RHR in SP pool cooling per S51.8.A App. 1, U/1, "Placing RHR SP Cooling in Service During a Plant Event"; Wrong:** Plausible to the candidate who recalls that High SP temperature directs placing two loops of cooling in service at SP/T-4. This action would have been directed previously when temperature exceeded 95 °F. This answer is wrong however because the loss of D114-R-G would remove power to all the relevant A loop RHR valves necessary to place it in service, therefore the loop is unavailable/inoperable
DISTRACTOR (D)	**Emergency Blowdown per T-112, Emergency Blowdown; Wrong:** Plausible to the candidate who determines that the operating point of the plant is above the curve for 90-1170, HCTL is exceeded and the only option is to perform the T-112 blowdown per SP/T-6 which directs T-112

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 93 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507469
Version ID:	3195127
User-Defined ID:	Q #93 NEW
Cross Reference Number:	OPEN - EMBEDDED
Topic:	(SRO Only) Suppression Pool High Temp
Num Field 1:	LM
Num Field 2:	SRO - HIGH
Text Field:	LO-ILT

Comments:

References Provided	OPEN - EMBEDDED HCTL Curve T-117, Safe and Unsafe region designation deleted
K/A Justification	None
SRO-Only Justification	Selection of TRIP steps
Additional Information	None

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	(295026) (G2.1.9) / 4.5
KA Statement	(EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE, CONDUCT OF OPERATIONS Ability to direct licensed personnel activities inside the control room (SRO Only) (CFR: 43.1 / 45.5 / 45.12 / 45.13)
Cognitive level	High
Safety Function	5
10 CFR 55	CFR: 43.1 / 45.5 / 45.12 / 45.13
Technical Reference with Revision No:	T-117 Rev 023
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS1560.04

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

94 **ID: 2505527** **Points: 1.00**

************SRO ONLY************

A hostile action is in progress at LGS, the TSC cannot be staffed.

The EOF is fully staffed and is ready to assume command and control function.
Per EP-AA-112-F-01 which of the following responsibilities are retained by the Shift Emergency Director?

1. Event Classification
2. State and local notifications
3. Emergency Exposure Control
4. Control of field monitoring teams

A. 1 and 2 only

B. 2 and 4 only

C. 1 and 3 only

D. 3 and 4 only

Answer: C

Answer Explanation

5. Command and Control, of the following functions will be performed by:
   a. Event Classification.....
   b. NRC Notifications.....
   c. Emergency Exposure Controls.....
   d. PAR Decision-Making .....
   e. State/Local Notifications.....

C **correct;** Event Classification,, NRC Notifications and Emergency Exposure Controls all remain on site. Since the TSC cannot be staffed, they remain with the Shift ED.

A, B, D are incorrect; A & B contain a function that the EOF will assume. D is incorrect because PAR Decision Making and State/Local Notification authority are allowed to transfer to the EOF. Plausible to the examinee who does not recall EP-AA-112-F-01 transferable responsibilities or recognize that the TSC is not activated.

ANSWER (C)	**1 and 3 only is correct:** Per EP-AA-112-F-01, Event Classification, NRC Notifications and Emergency Exposure Controls all remain on site. Since the TSC cannot be staffed, they remain with the Shift ED.
DISTRACTOR (A)	**1 and 2 is wrong:** Plausible answer because state and local notification is initially performed by the MCR and tansferred to the EOF. NRC notification is also initially done by the shift and transferred to the TSC. These confusing differences can make 2 plausible. This is incorrect as State and Local notifications are performed by the EOF when activated.
DISTRACTOR (B)	**2 and 4 is wrong:** Plausible answer given that the Shift ED will perform the State and Local notifications of the intitial declaration and field monitoring teams are locally sourced at the station. This is incorrect as the EOF will assume the responsibility for both State and local notifications and field monitoring teams activated per EP-AA-112-F-01
DISTRACTOR (D)	**3 and 4 is wrong:** It is plausible that without the TSC activated, the Shift ED would not transfer field monitoring team responsibilities given that the teams are locally sourced at the station. The EOF has the responsibility for FMT dispatch and also the tools and expertise to know where the teams are needed to survey.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 94 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.50
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2505527
Version ID:	3194347
User-Defined ID:	Q #94 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) E-Plan lines of authority
Num Field 1:	LM
Num Field 2:	SRO-LOW
Text Field:	LO-I

Comments:

References Provided	None
K/A Justification	This question requires the candidate to recognize which functions the Shift has transferred responsibility to the TSC and those which the EOF has assummed
SRO-Only Justification	This tests at the SRO level because it requires knowledge of administrative procedures that specify implementation of plant emergency procedures.
Additional Information	This question is appropriate for the novice applicant who infrequently trains in the role of Shift Manager.

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	G2.4.37 / 4.1
KA Statement	(G2.4.37) EMERGENCY PROCEDURES / PLAN Knowledge of the lines of authority during implementation of the emergency plan implementing procedures (CFR: 41.10 / 45.13)
Cognitive level	Low
Safety Function	N/A
10 CFR 55	CFR: 41.10 / 45.13
Technical Reference with Revision No:	EP-AA-1000 Rev 33 EP-AA-112-F-01 rev. H
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1702.1

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

95 **ID: 2490730** **Points: 1.00**

**********SRO ONLY**********

A plant transient on Unit 1 resulted in a lowering Reactor Level.

The RO took action to correct the Reactor Level trend, and restored Reactor Level to its normal band.

SCRAM SYSTEM LOGIC lights at panel 10C603 indicate as follows:

A1 (DS9C)	Lit	B1 (DS9D)	Lit
A2 (DS9G)	Lit	B2 (DS9H)	Lit
A3 (DS9E)	Lit	B3 (DS9F)	Lit
A4 (DS9A)	Lit	B4 (DS9B)	Lit

With the plant stable at a reduced Reactor Power, a review of PPC data indicates that the lowest Reactor Level was as follows:

- A Narrow Range Level 11 inches
- B Narrow Range Level 12 inches
- C Narrow Range Level 14 inches
- D Narrow Range Level 13 inches

Determine which procedure must be directed in order to proceed.

A. Reset Half Scram per ARC-MCR-108-B1, AUTO SCRAM CHANNEL A1, no S/D required

B. Insert manual half scram on affected RPS side per OT-117, RPS FAILURES, no S/D required

C. Shutdown Unit 1 per GP-4, RAPID PLANT SHUTDOWN TO HOT SHUTDOWN

D. Manually scram per OT-200 APPENDIX 1, RO REACTOR SCRAM HARD CARD

Answer: C

Answer Explanation

ANSWER (C)	**Shutdown Unit 1 per GP-4, RAPID PLANT SHUTDOWN TO HOT SHUTDOWN is correct.** This question requires an understanding of the RPS setpoints and logic, and once it is determined the desinged response of the system, to direct a procedure with which to proceed. RPS executes a scram signal based on 1/2 twice logic on a level below Low Level 3 at 12.5 inches. The logic assesses either A or C channels and either B or D channels. If either A or C is below 12.5 inches, and either B or D is below 12.5 inches, a full scram should occur. The stem conditions show both A and B channels below 12.5 inches, therefore a full scram should have occurred. The logic lights show indication of no scram or half scram (RPS energized). In this case, OT-117 section 3.1 requires action for a scram in retrospect: perform a rapid plant shutdown per GP-4.
DISTRACTOR (A)	**Reset Half Scram per ARC-MCR-108-B1, AUTO SCRAM CHANNEL A1 is wrong.** This is plausible because A1 channel RPS should have actuated, resulting in a A side half scram. This is wrong because the SCRAM SYSTEM LOGIC lights indicate no half scram condition, and resetting would be ineffective.
DISTRACTOR (B)	**Insert manual half scram on affected RPS side per OT-117, RPS FAILURES is wrong.** This is plausible because it tests an understanding in the difference of logic between RPS Low Level 3 and Main Turbine Trip High Level 8 logic. For a Main Turbine Trip to be executed, plant design is that either of A or B channels AND either of C or D channels are above the setpoint. In the stem, the conditions given are that both A and B exceeded the trip setpoint.
DISTRACTOR (D)	**Manually scram per OT-200 APPENDIX 1, RO REACTOR SCRAM HARD CARD is wrong.** This is plausible because a full scram should have occurred. However, this wrong because OT-117 section 2.1.1 requires a manual scram only if the scram condition is still present. The important safety significance is found in OT-117 basis step 6.3, which reads "Since the plant is currently not in a transient condition, it is appropriate to first reduce recirc. flow before scramming reactor to minimize possibility of tripping turbine should the control rods fail to insert."

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 95 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2490730
Version ID:	3194368
User-Defined ID:	Q #95 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) RPS, EPE APE crew responsibilities
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires detailed system knowledge of RPS setpoints and logic arrangement, as well as the procedure required to mitigate a failure of RPS.
SRO-Only Justification	This tests at the SRO level of knowledge as it requires an assessment of abnormal plant conditions, and then prescribing a procedure with which to proceed.
Additional Information	N/A

General Data	
Level	SRO
Tier	2
Group	1
KA # and Rating	(212000) (G2.4.12) / 4.3
KA Statement	(212000) (SF7 RPS) REACTOR PROTECTION SYSTEM (G2.4.12) EMERGENCY PROCEDURES / PLAN Knowledge of operating crew responsibilities during emergency and abnormal operations (CFR: 41.10 / 45.12)
Cognitive level	High
Safety Function	7
10 CFR 55	CFR: 41.10 / 45.12
Technical Reference with Revision No:	OT-117 Rev 12
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS0071.8

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

96 **ID: 2504083** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is performing a major overhaul of the HPCI turbine.

A LOCA with LOOP occurs resulting in an offsite release

- T-104, "Radioactivity Release" is entered
- RCIC Isolated on Low Steam pressure and T-247 U2, "RCIC Low Steam Line Pressure Isolation Bypass" was dispatched

Level dropped below the top of active fuel and cannot be recovered

Core damage is occurring

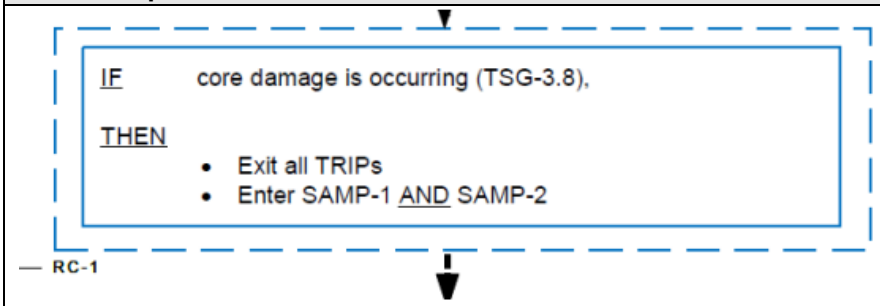
Determine for Unit 2:

(1) which TRIP/SAMP procedure(s) should be executed
(2) whether T-247 U2 should be continued

	(1)	(2)
A.	SAMP 1 and 2 only	Exit T-247
B.	SAMP 1 and 2 only	Continue T-247
C.	T-104 and Samp 1	Exit T-247
D.	T-104 and Samp 1	Continue T-247

Answer: B

Answer Explanation



ANSWER (B)	**SAMP 1 and 2 only, Continue T-247 is correct.** With Dose Assessment results above the ALERT level, entry into T-104 is required. The restoration of RCIC from Low Steam Pressure Isolation is a priority as RCIC may be the only system preventing catastrophic core loss. The direction from T-101 RC-1 above states that "IF core damage is occurring, Exit ALL Trips and enter SAMP 1 and 2". T-247 is imperative to restore RCIC and should be continued as the direction to perform this task is found in both T-101, RC/L-3 and SAMP-1 Step RC/L-2 .
DISTRACTOR (A)	**SAMP 1 and 2 only, Exit T-247 is wrong.** This is plausible as the common understanding is that Trips are exited when SAMPs are entered. The novice applicant could equate T-200 procedures with the direction to exit TRIPS. As noted above, mitigation efforts that aid in the restoration of systems called out in SAMPS should not be discontinued.as this is obviously counterproductive.
DISTRACTOR (C)	**T-104 and Samp 1, Exit T-247 is wrong.** This is plausible to the novice operator because the direction to enter SAMPs comes out of T-101 not T-104. T-104 is addressing the Radioactive Release so it is plausible to continue in that procedure. It is wrong however as the direction in T-101 is to exit ALL trips and enter SAMP-1 and SAMP-2. Samp-2 is the radioactive release SAMP procedure. Exiting T-247 is wrong as noted above.
DISTRACTOR (D)	**T-104 and Samp 1, Continue T-238 is wrong.** This is plausible to the novice operator because the direction to enter SAMPs comes out of T-101 not T-104. T-104 is addressing the Radioactive Release so it is plausible to continue in that procedure. It is wrong however as the direction in T-101 is to exit ALL trips and enter SAMP-1 and SAMP-2. Samp-2 is the radioactive release SAMP procedure.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 96 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504083
Version ID:	3193619
User-Defined ID:	Q #96 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) EPE procedure hierarchy/coordination, T-104
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question tests the candidates understanding of RPV injection systems broadly available during a plant event, and asks the candidate to determine the hierarchy among the EOPs and SAMPS for radioactive release
SRO-Only Justification	This question requires detailed knowledge of the procedures above the general progression of an event. IT requires the SRO to evaluate transition between EOPs and Severe Accident procedures to determine the hierarchy of implementation. This includes the integration of abnormal/trip implementing procedures such as T-200s with both EOPs and SAMPs
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	1
KA # and Rating	(295038) (G2.4.16) / 4.4
KA Statement	(EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE (G2.4.16) EMERGENCY PROCEDURES / PLAN Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, or severe accident management guidelines (CFR: 41.10 / 43.5 / 45.13)
Cognitive level	High
Safety Function	9
10 CFR 55	CFR: 41.10 / 43.5 / 45.13
Technical Reference with Revision No:	T-104 Rev 14 T-101 Rev 28 SAMP-1 Rev 11 SAMP-2 Rev 14

	Question History: (i.e. LGS NRC-05)	New
	Question Type: (New, Bank, Modified)	New
	Revision History:	New
	Training Objective	LGSOPS1560.6

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

97 **ID: 2507213** **Points: 1.00**

**********SRO ONLY**********

Unit 1 has experienced an Extended Loss of All AC Power.

- The shift is executing T-370, PRIMARY AND ALTERNATE INSTRUMENTATION DURING ELAP
- Suppression Pool Pressure is not available
- Reactor Pressure is 910 psig steady

T-370 parameter results:

- Drywell pressure is 20.2 psig up slow
- Drywell temperature is 305 °F up slow

Determine the procedure to be entered and the section required per T-102, "Primary Containment Control"

A. T-225, Section 4.6, "Initiating Suppression Pool Spray Using Fire Protection System"

B. T-225, Section 4.11, "Initiating Drywell Spray Using Fire Protection System"

C. T-112, "Emergency Blowdown" due to High Drywell Temperature

D. T-112 "Emergency Blowdown" due to Exceeding the Pressure Suppression Pressure Curve

Answer: B

Answer Explanation

ANSWER (B)	**T-225, Section 4.11, "Initiating Drywell Spray Using Fire Protection System" is correct.** Because Suppression Pool Pressure is not available, Drywell Pressure must be used in determination of whether the Suppression Chamber Spray Initiation Pressure (SCSIP) has been exceeded. Per T-102 step PC/P-6 and -7, Drywell Pressure must exceed 12 psig before Drywell Spray is required Since DW pressure is 20.2 psig, suppression pool pressure is approximately 15.5 psig. At this pressure PC/P-6 is directs to continue and PC/P-7 directs spraying the DW. .
DISTRACTOR (A)	**T-225, Section 4.6, "Initiating Suppression Pool Spray Using Fire Protection System" is wrong.** This is plausible because when SP pressure is determined, Suppression Pool should be sprayed when DW pressure exceeds 1.68 psig. Per T-102 step PC/P-5 and -6, Suppression Pool Spray is required prior to exceeding 12 psig in the Drywell. However, when SP pressure exceeds 7.5 psig, then DW spray should be directed.
DISTRACTOR (C)	**T-112, "Emergency Blowdown" due to High Drywell Temperature is wrong.** This is plausible because the high Drywell Temperature leg does have an action in step DW/T-9 to blowdown. It states when temperature CANNOT be restored and maintained below 340°F, then continue to the blowdown step. This is wrong as the blowdown threshold (340°) has not been reached yet and the step to spray containment (DW/T-7) has not been exercised yet.
DISTRACTOR (D)	**T-112 "Emergency Blowdown" due to Exceeding the Pressure Suppression Pressure Curve is wrong.** This is plausible because the candidate is familiar with the PSP curve and all of them recognize that 20 psig in the Suppression Pool is the upper limit where T-112 is required. However, given the need to perform T-370, the drywell pressure is provided. Unless the candidate recalls the need to correct for SP pressure (-4.5 psig) they will determine SP pressure incorrectly.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 97 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2507213
Version ID:	3195108
User-Defined ID:	Q #97 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) High DW Press, interpret and direct
Num Field 1:	LM
Num Field 2:	SRO-HIGH
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question assesses the candidate's ability to use an alternate indication for drywell pressure and to correctly interpret the drywell pressure to ascertain SP pressure. It then requires the candidate to understand how a directive will properly mitigate that drywell pressure.
SRO-Only Justification	This question is at the SRO level as it tests two aspects requiring SRO knowledge: a detailed understanding of the procedure (T-102) instead of a basic understanding of the general progression of an event, as well as recall of the different values associated with Suppression Chamber Spray Initiation Pressure (SCSIP), DW Spray Initiation Pressure ; and the ability to then direct a portion of a procedure to mitigate an event.
Additional Information	N/A

General Data	
Level	SRO
Tier	1
Group	2
KA # and Rating	(295010) (G2.2.44) / 4.4
KA Statement	(295010) (APE 10) HIGH DRYWELL PRESSURE (G2.2.44) EQUIPMENT CONTROL: Ability to interpret control room indications to verify the status and operation of a system and understand how operator actions and directives affect plant and system conditions (CFR: 41.5 / 43.5 / 45.12)
Cognitive level	High
Safety Function	5
10 CFR 55	CFR: 41.5 / 43.5 / 45.12
Technical Reference with Revision No:	T-370 U/1, Rev. 2 T-225 U/1, Rev. 26 T-102, Rev. 28
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

	Training Objective	LGSOPS1560.6

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

98 **ID: 2504102** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is operating at 100% Reactor Power

The "0A" Toxic Gas monitor has been declared INOP and placed in a trip condition

I&C technicians have completed work on the monitor and are ready to perform their PMT

The retest requires that the trip signal be cleared

WHICH ONE of the following actions is required to perform the PMT?

A. Enter TRM LCO 3.0.3, perform the PMT, then exit TRM LCO 3.0.3

B. Initiate a Control Room Chlorine Isolation until the testing is complete

C. Take alternate compensatory measures per TRM LCO 3.0.7

D. Perform the test under TRM LCO 3.0.5, complete the PMT, then declare the equipment operable

Answer: D

Answer Explanation

From TRM 3.0.5

TRM 3.0.5 Equipment removed from service or declared inoperable to comply with ACTIONs may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to the second premise of Specification 3.0.1 and is an exception to Specification 3.0.2 (i.e., to not comply with the applicable ACTION(s)) for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

TRM 3.0.5 Bases
Specification 3.0.5 establishes the allowance for restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with ACTIONs. The sole purpose of this Specification is to provide an exception to Specifications 3.0.1 and 3.0.2 (e.g., to not comply with the applicable ACTION(s)) to allow the performance of required testing to demonstrate:
a. The OPERABILITY of the equipment being returned to service, or

b. The OPERABILITY of other equipment.

The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the ACTIONs is limited to the time necessary to perform the required testing to demonstrate OPERABILITY. This Specification does not provide time to perform any other preventive or corrective maintenance.
LCO 3.0.5 should not be used in lieu of other practicable alternatives that comply with Required Actions and that do not require changing the MODE or other specified conditions in the Applicability in order to demonstrate equipment is OPERABLE. LCO TRM 3.0.5 is not intended to be used repeatedly.

ANSWER (D)	**Perform the test under TRM LCO 3.0.5, complete the PMT, then declare the equipment operable; Correct:** As described above
DISTRACTOR (A)	**Enter TRM LCO 3.0.3, perform the PMT, then exit TRM LCO 3.0.3; Wrong:** Plausible to the candidate who recalls that TRM 3.0.3 is used when no action is provided in the TRM for a given condition and doesn't recall how else to test.
DISTRACTOR (B)	**Initiate a Control Room Chlorine Isolation until the testing is complete; Wrong:** Plausible to the candidate who recalls the required action from TRM 3.3.7.8.2 action for multiple monitors INOP. This is not required per TRM 3.0.5.
DISTRACTOR (C)	**Take alternate compensatory measures per TRM LCO 3.0.7; Wrong:** Plausible to the candidate who recalls that alternate compensatory measures could include admin controls, manual actions and temporary procedures. However, this LCO is designed specifically for FIRE protection related features, not for general application

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 98 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2504102
Version ID:	3178352
User-Defined ID:	Q #98 BANK PREVIOUS 2 EXAMS
Cross Reference Number:	CLOSED
Topic:	SRO Only - PMT TS 3.0.5
Num Field 1:	LM
Num Field 2:	SRO HIGH
Text Field:	LO-ILT

Comments:

References Provided	None
K/A Justification	This question meets the intent of the K/A because the question is testing the candidates knowledge of a LCO applicability for post maintenance testing. The specific system involved is the toxic gas monitor in the Control Room Ventilation System., The candidate must know that TRM LCO 3.0.5 allows Post Maintenance testing without taking additional compensatory actions.
SRO-Only Justification	This question is an SRO only question because it requires knowledge of the TRM for Toxic Gas monitoring system and its interrelationship with the Control Room Ventilation System. It then requires the SRO candidate to determine applicability of TS 3.0.5 for determing the method of PMT
Additional Information	N/A

General Data	
Level	SRO
Tier	3
Group	
KA # and Rating	290003 / G2.2.21 4.1
KA Statement	Control Room Ventilations / Knowledge of pre- and post-maintenance operability requirements.
Cognitive level	High
Safety Function	N/A
10 CFR 55	43.2
Technical Reference with Revision No:	TS U2 3.0.5 Rev.197 TRM 3.3.7.8.2 Rev.068
Question History: (i.e. LGS NRC-05)	LGS NRC 21
Question Type: (New, Bank, Modified)	Bank
Revision History:	
Training Objective	LGSOPS1700.06

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

99 **ID: 2505386** **Points: 1.00**

**********SRO ONLY**********

Unit 1 is operating at 100% Reactor Power

T= 0 minutes

The 1 "J" Safety Relief Valve opens inadvertently and **does not** reclose

- The white light on the SRV is lit

CRS enters the appropriate procedure, and dispatches an EO to remove the fuses for the 1 J SRV

T=7 minutes

- Reactor Power is reduced to 85% per RMSI
- Safety Relief Valve remains open

T= 10 minutes

- EO pulls the fuses for the 1 J Safety Relief Valve
- 1 J Safety Relief Valve remains open

1) At what time is the CRS required to direct a plant shutdown?

and

2) What type of Reactor Shutdown is directed if the SRV remains open?

	1	2
A.	T= 7 min.	GP-3 Normal Plant Shutdown
B.	T= 7 min.	GP-4 Rapid Plant Shutdown
C.	T= 10 min.	GP-3 Normal Plant Shutdown
D.	T= 10 min.	GP-4 Rapid Plant Shutdown

Answer: B

Answer Explanation	
ANSWER (B)	**T= 7 min., GP-4 Normal Plant Shutdown is correct:** Per OT-114 step 3.6, the CRS should direct a GP-4 shutdown if the SRV remains open after power is lowered below 85%. This is because the power change makes a small change in Rx pressure which may influence the valve to close. If it does not, the GP-4 is directed to take action as soon as possible to minimize heat into the suppression pool.
DISTRACTOR (A)	**T= 7 min., GP-3 Rapid Plant Shutdown is wrong:** As noted above, when power is less than 85%, a decision must be made. A plausible decision is to shutdown the reactor using GP-3, Normal Plant shutdown. This would have the benefit of controlling pressure/preventing a depressurization event and the SRV may close as power is additionally lowered. GP-3 is incorrect as the rate of heat input into the containment would cause T-102 entry and reactor scram on 110°F in the SP.
DISTRACTOR (C)	**T= 10 min., GP-3 Normal Plant Shutdown is wrong:** Plausible answer to wait until fuses are removed. With the white light on for the 1J SRV, pulling the fuses could allow the SRV to close if it truly was an electrical signal opening the valve. However, the additional time required for field actions to be performed would allow for unacceptable heating of the SP until the fuses were removed. GP-3 is wrong as noted above due to the time required to shutdown the reactor.
DISTRACTOR (D)	**T= 10 min., GP-4 Rapid Plant Shutdown is wrong:** Plausible answer to wait until fuses are removed. With the white light on for the 1J SRV, pulling the fuses could allow the SRV to close if it truly was an electrical signal opening the valve. However, the additional time required for field actions to be performed would allow for unacceptable heating of the SP until the fuses were removed.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 99 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2505386
Version ID:	3194556
User-Defined ID:	Q #99 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) Stuck open SRV
Num Field 1:	LM
Num Field 2:	SRO High
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question directly posits a stuck open SRV, with the result that action must be determined based on information from an Off normal procedure (OT-114)
SRO-Only Justification	This question is SRO only because it requires the candidate to determine actions contained in an off normal procedure beyond the level of immediate operator actions and basic flow. The SRO must recognize the type of malfunction and direct the mitigative actions.
Additional Information	N/A

General Data	
Level	SRO
Tier	2
Group	1
KA # and Rating	239002 A2.03 4.4
KA Statement	SRV: Ability to (a) predict the impacts of the following on the Safety Relief Valves and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Stuck-open SRV
Cognitive level	High
Safety Function	3
10 CFR 55	(CFR: 41.5 / 43.5 / 45.6)
Technical Reference with Revision No:	OT-114 Rev.039
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	
Training Objective	LGSOPS1540.05

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

100 **ID: 2490754** **Points: 1.00**

**********SRO ONLY**********

During performance of a system operating procedure, the performing operator identifies that a step cannot be performed as written.

- As written, the step directs repositioning a valve to the wrong position for the desired system operation
- As written, the return to normal step for that valve does list the correct position
- The step is required to be performed for successful completion of the procedure
- The required change to the procedure does not change the purpose of the procedure

Which process will correct the procedure for use?

A. Interim Change

B. Partial Performance

C. Pen and Ink Change

D. Temporary Procedure Change

Answer: D

Answer Explanation

ANSWER (D)	**Temporary Procedure Change is correct.** AD-AA-101 states that a Temporary Change is "a non-permanent procedure change that does not contain a change of intent." This is accomplished on form AD-AA-101-F-10, which then requires a "full review, approval and authorization of the temporary procedure change using Form AD-AA-101-F-01 within 14 days." A Temporary Change is not permitted to involve any of the following: "□ The revision changes the purpose or methodology of the procedure as defined in the 'Statement of Applicability' or 'Purpose'. □ The revision changes assumptions or conclusions in the UFSAR. □ The revision involves an unapproved setpoint or scaling change. □ The revision changes technical specification or other regulatory related acceptance criteria. □ The revision modifies any commitment to regulators. □ The revision changes plant configuration." This same information is also contained in AD-LG-101-1002
DISTRACTOR (A)	**Interim Change is wrong.** Per AD-AA-101, and interim change is "A non-permanent document change that contains a change of intent." This is processed on a different form and does not have the same restrictions as a Temporary Change. This is plausible because an Interim Change is a non-permanent change and could be used during a procedure in-progress. It is, however, the wrong process to use in this case.
DISTRACTOR (B)	**Partial Performance is wrong.** Per HU-AA-104-101, a Partial Performance is used "IF a portion of a procedure is used in lieu of performing the procedure in its entirety." In this case, the step is required to be performed for successful completion of the procedure. This is plausible because it would be appropriate if the step in question did not reposition any components, and could be eliminated.
DISTRACTOR (C)	**Pen and Ink Change is wrong.** This is plausible because it is a process which used to be used in the industry for small changes such as typographical errors, and an organizational memory may be present of Pen and Ink changes. However, this is no longer an approved process, and is not described in the administrative procedure usage procedures.

Test Answer Key

Final SRO exam 11-27-23
Test ID: 374893

Question 100 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	0.00
Allow multiple selections?	No
Randomize choice order?	No
System ID:	2490754
Version ID:	3185736
User-Defined ID:	Q #100 NEW
Cross Reference Number:	CLOSED
Topic:	(SRO Only) procedure changes
Num Field 1:	LM
Num Field 2:	SRO-LOW
Text Field:	ILT

Comments:

References Provided	None
K/A Justification	This question requires the candidate to differentiate among processes with which to change procedures.
SRO-Only Justification	NUREG-1021 describes "processes for changing the plant or plant procedures" as SRO level knowledge.
Additional Information	N/A

General Data	
Level	SRO
Tier	3
Group	N/A
KA # and Rating	G2.2.6 / 3.6
KA Statement	(G2.2.6) EQUIPMENT CONTROL Knowledge of the process for making changes to procedures (CFR: 41.10 / 43.3 / 45.13)
Cognitive level	Low
Safety Function	N/A
10 CFR 55	(CFR: 41.10 / 43.3 / 45.13)
Technical Reference with Revision No:	AD-AA-101 Rev 31
Question History: (i.e. LGS NRC-05)	New
Question Type: (New, Bank, Modified)	New
Revision History:	New
Training Objective	LGSOPS2005A.1

KEY VERIFY RESCORE

Student ID Number

USE NO. 2 PENCIL ONLY
- EXAMPLE: ⊂A⊃ ⊂B⊃ ■ ⊂D⊃ ⊂E⊃
- MAKE *DARK* MARKS
- ERASE *COMPLETELY* TO CHANGE
- MAKE NO STRAY MARKS

TEST RECORD	
PART 1	
PART 2	
TOTAL	

Firmware Ver. 3.3+

NAME LGS 2023 SRO EXAM (Last) (First)

SUBJECT INSTRUCTOR

DATE PERIOD

Apperson 800.827.9219
A1705 - RR 05/10 US Patent No. 6,079,624

	(T)	(F)
1		B
2	A	
3	A	
4	A	
5		B
6	A	
7	A	
8	A	
9		B
10		B
11	A	
12	A	
13	A	
14		B
15	A	
16	A	
17	A	
18		B
19	A	
20	A	
21	A	
22		B
23	A	
24	A	
25		B
26		B
27	A	
28	A	
29	A	
30	A	
31	A	
32		B
33	A	
34		B
35		B
36	A	
37	A	
38	A	
39	A	
40		B
41		B
42	A	
43	A	
44	A	
45	A	
46		B
47	A	
48	A	
49	A	
50	A	

* Q17: deleted

SRO

* NOTE:
Based on post exam comments, the following changes to the exam key are made:

Q17: Deleted
Q46: Accept both A and B as correct
Q92: Accept both A and B as correct

* Q46: Both A and B are accepted as correct

KEY VERIFY RESCORE ⊏R⊐

Student ID Number

USE NO. 2 PENCIL ONLY

- EXAMPLE: ⊏A⊐ ⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
- MAKE *DARK* MARKS
- ERASE *COMPLETELY* TO CHANGE
- MAKE NO STRAY MARKS

ESSAY SCORE

TEST RECORD	
PART 1	
PART 2	
TOTAL	

Firmware Ver. 3.3+

NAME LGS SRO 2023 EXAM (Last) (First)

SUBJECT _____ INSTRUCTOR _____

DATE _____ PERIOD _____

	(T)	(F)
51	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
52	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
53	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
54	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
55	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
56	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
57	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
58	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
59	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
60	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
61	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
62	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
63	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
64	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
65	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
66	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
67	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
68	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
69	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
70	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
71	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
72	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
73	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
74	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
75	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
76	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
77	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
78	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
79	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
80	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
81	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
82	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
83	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
84	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
85	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
86	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
87	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
88	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
89	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
90	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
91	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
92	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
93	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
94	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
95	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
96	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
97	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
98	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
99	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
100	⊏A⊐	⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐

SRO

* NOTE:
Based on post exam comments, the following changes to the exam key are made:

Q17: Deleted
Q46: Accept both A and B as correct
Q92: Accept both A and B as correct

* Q92: Both A and B are accepted as correct

Test Answer Key (Answers Only)

LGS 2023ISRO Exam
Test ID: 374893

1 **ID: 2504667** **Points: 1.00**

Answer: A

2 **ID: 2495410** **Points: 1.00**

Answer: D

3 **ID: 2504125** **Points: 1.00**

Answer: B

4 **ID: 2495419** **Points: 1.00**

Answer: B

5 **ID: 2495367** **Points: 1.00**

Answer: A

6 **ID: 2495963** **Points: 1.00**

Answer: C

7 **ID: 2495161** **Points: 1.00**

Answer: D

8 **ID: 2495386** **Points: 1.00**

Answer: C

9 **ID: 2496014** **Points: 1.00**

Answer: A

10 **ID: 2507326** **Points: 1.00**

Answer: A

11 **ID: 2495420** **Points: 1.00**

Answer: B

Test Answer Key (Answers Only)

LGS 2023ISRO Exam
Test ID: 374893

12 **ID: 2495312** **Points: 1.00**

Answer: D

13 **ID: 2495713** **Points: 1.00**

Answer: C

14 **ID: 2507056** **Points: 1.00**

Answer: A

15 **ID: 2495354** **Points: 1.00**

Answer: D

16 **ID: 2495949** **Points: 1.00**

Answer: B

17 **ID: 2507161** **Points: 1.00**

Answer: B *Q17: Deleted

18 **ID: 2495937** **Points: 1.00**

Answer: A

19 **ID: 2495689** **Points: 1.00**

Answer: B

20 **ID: 2495854** **Points: 1.00**

Answer: B

21 **ID: 2495593** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023ISRO Exam

Test ID: 374893

22 **ID: 2495739** **Points: 1.00**

Answer: A

23 **ID: 2507010** **Points: 1.00**

Answer: C

24 **ID: 2504584** **Points: 1.00**

Answer: D

25 **ID: 2495999** **Points: 1.00**

Answer: A

26 **ID: 2503044** **Points: 1.00**

Answer: A

27 **ID: 2495765** **Points: 1.00**

Answer: D

28 **ID: 2504248** **Points: 1.00**

Answer: C

29 **ID: 2495908** **Points: 1.00**

Answer: B

30 **ID: 2507074** **Points: 1.00**

Answer: B

31 **ID: 2495692** **Points: 1.00**

Answer: D

32 **ID: 2495660** **Points: 1.00**

Answer: B

Test Answer Key (Answers Only)

LGS 2023ISRO Exam
Test ID: 374893

33 **ID: 2507083** **Points: 1.00**

Answer: D

34 **ID: 2496054** **Points: 1.00**

Answer: A

35 **ID: 2496056** **Points: 1.00**

Answer: A

36 **ID: 2496021** **Points: 1.00**

Answer: B

37 **ID: 2495464** **Points: 1.00**

Answer: C

38 **ID: 2496046** **Points: 1.00**

Answer: D

39 **ID: 2496024** **Points: 1.00**

Answer: D

40 **ID: 2495352** **Points: 1.00**

Answer: A

41 **ID: 2507315** **Points: 1.00**

Answer: A

42 **ID: 2495486** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023ISRO Exam

Test ID: 374893

43 **ID: 2495350** **Points: 1.00**

Answer: D

44 **ID: 2507328** **Points: 1.00**

Answer: C

45 **ID: 2495784** **Points: 1.00**

Answer: D

46 **ID: 2495760** **Points: 1.00**

Answer: A *Q46: Both A and B are accepted as correct

47 **ID: 2495580** **Points: 1.00**

Answer: D

48 **ID: 2495297** **Points: 1.00**

Answer: C

49 **ID: 2507320** **Points: 1.00**

Answer: C

50 **ID: 2495415** **Points: 1.00**

Answer: C

51 **ID: 2495616** **Points: 1.00**

Answer: D

52 **ID: 2504703** **Points: 1.00**

Answer: B

53 **ID: 2504676** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023ISRO Exam

Test ID: 374893

54 **ID: 2505242** **Points: 1.00**

Answer: C

55 **ID: 2495795** **Points: 1.00**

Answer: B

56 **ID: 2496003** **Points: 1.00**

Answer: D

57 **ID: 2495505** **Points: 1.00**

Answer: C

58 **ID: 2495997** **Points: 1.00**

Answer: D

59 **ID: 2495691** **Points: 1.00**

Answer: A

60 **ID: 2495681** **Points: 1.00**

Answer: B

61 **ID: 2507300** **Points: 1.00**

Answer: D

62 **ID: 2495832** **Points: 1.00**

Answer: D

63 **ID: 2500131** **Points: 1.00**

Answer: A

Test Answer Key (Answers Only)

LGS 2023ISRO Exam
Test ID: 374893

64 **ID: 2496049** **Points: 1.00**

Answer: B

65 **ID: 2495390** **Points: 1.00**

Answer: D

66 **ID: 2495353** **Points: 1.00**

Answer: C

67 **ID: 2495669** **Points: 1.00**

Answer: B

68 **ID: 2496033** **Points: 1.00**

Answer: B

69 **ID: 2495873** **Points: 1.00**

Answer: A

70 **ID: 2495357** **Points: 1.00**

Answer: C

71 **ID: 2505274** **Points: 1.00**

Answer: D

72 **ID: 2495430** **Points: 1.00**

Answer: D

73 **ID: 2495996** **Points: 1.00**

Answer: A

74 **ID: 2495174** **Points: 1.00**

Answer: B

Test Answer Key (Answers Only)

LGS 2023ISRO Exam

Test ID: 374893

75 **ID: 2504247** **Points: 1.00**

Answer: C

76 **ID: 2491265** **Points: 1.00**

Answer: C

77 **ID: 2491304** **Points: 1.00**

Answer: A

78 **ID: 2502544** **Points: 1.00**

Answer: B

79 **ID: 2506881** **Points: 1.00**

Answer: A

80 **ID: 2490714** **Points: 1.00**

Answer: C

81 **ID: 2507289** **Points: 1.00**

Answer: B

82 **ID: 2502984** **Points: 1.00**

Answer: B

83 **ID: 2490582** **Points: 1.00**

Answer: C

84 **ID: 2490713** **Points: 1.00**

Answer: A

Test Answer Key (Answers Only)

LGS 2023ISRO Exam
Test ID: 374893

85 **ID: 2494601** **Points: 1.00**

Answer: C

86 **ID: 2504705** **Points: 1.00**

Answer: A

87 **ID: 2491102** **Points: 1.00**

Answer: D

88 **ID: 2490712** **Points: 1.00**

Answer: B

89 **ID: 2504026** **Points: 1.00**

Answer: B

90 **ID: 2491111** **Points: 1.00**

Answer: D

91 **ID: 2504068** **Points: 1.00**

Answer: A

92 **ID: 2491085** **Points: 1.00**

Answer: A *Q92: Both A and B are accepted as correct

93 **ID: 2507469** **Points: 1.00**

Answer: B

94 **ID: 2505527** **Points: 1.00**

Answer: C

95 **ID: 2490730** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023ISRO Exam

Test ID: 374893

96 **ID: 2504083** **Points: 1.00**

Answer: B

97 **ID: 2507213** **Points: 1.00**

Answer: B

98 **ID: 2504102** **Points: 1.00**

Answer: D

99 **ID: 2505386** **Points: 1.00**

Answer: B

100 **ID: 2490754** **Points: 1.00**

Answer: D

KEY VERIFY RESCORE ⊂R⊃

Student ID Number

ESSAY SCORE

USE NO. 2 PENCIL ONLY

- EXAMPLE: ⊂A⊃ ⊂B⊃ ■ ⊂D⊃ ⊂E⊃
- MAKE ***DARK*** MARKS
- ERASE ***COMPLETELY*** TO CHANGE
- MAKE NO STRAY MARKS

TEST RECORD	
PART 1	
PART 2	
TOTAL	

Firmware Ver. 3.3+

NAME LGS 2023 RO EXAM
(Last) (First)

SUBJECT _____ INSTRUCTOR _____

DATE _____ PERIOD _____

Apperson 800.827.9219
A1705 - RR 05/10 US Patent No. 6,079,624

	(T)	(F)
1	■	B
2	A	B
3	A	■
4	A	■
5	■	B
6	A	B
7	A	B
8	A	B
9	■	B
10	■	B
11	A	■
12	A	B
13	A	B
14	■	B
15	A	B
16	A	B
17	A	B
18	■	B
19	A	■
20	A	■
21	A	■
22	■	B
23	A	B
24	A	B
25	■	B
26	■	B
27	A	B
28	A	■
29	A	■
30	A	■
31	A	B
32	A	■
33	A	B
34	■	B
35	■	B
36	A	■
37	A	B
38	A	B
39	A	B
40	■	B
41	■	B
42	A	B
43	A	B
44	A	B
45	A	B
46	■	B
47	A	B
48	A	B
49	A	B
50	A	■

* NOTE:
Based on post exam comments, the following changes to the exam key are made:
Q17: Deleted
Q46: Accept both A and B as correct

* Q17: deleted

RO

* Q46: Both A and B are accepted as correct

KEY VERIFY RESCORE ⊂R⊃

Student ID Number

ESSAY SCORE

USE NO. 2 PENCIL ONLY

- EXAMPLE: ⊂A⊃ ⊂B⊃ ■ ⊂D⊃ ⊂E⊃
- MAKE ***DARK*** MARKS
- ERASE ***COMPLETELY*** TO CHANGE
- MAKE NO STRAY MARKS

TEST RECORD	
PART 1	
PART 2	
TOTAL	

Firmware Ver. 3.3+

NAME LGS 2023 Ro EXAM
(Last) (First)

SUBJECT _____ INSTRUCTOR _____

DATE _____ PERIOD _____

	(T)	(F)			
51	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
52	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
53	⊂A⊃	⊂B⊃	■	⊂D⊃	⊂E⊃
54	⊂A⊃	⊂B⊃	■	⊂D⊃	⊂E⊃
55	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
56	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
57	⊂A⊃	⊂B⊃	■	⊂D⊃	⊂E⊃
58	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
59	■	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
60	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
61	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
62	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
63	■	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
64	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
65	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
66	⊂A⊃	⊂B⊃	■	⊂D⊃	⊂E⊃
67	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
68	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
69	■	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
70	⊂A⊃	⊂B⊃	■	⊂D⊃	⊂E⊃
71	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
72	⊂A⊃	⊂B⊃	⊂C⊃	■	⊂E⊃
73	■	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
74	⊂A⊃	■	⊂C⊃	⊂D⊃	⊂E⊃
75	⊂A⊃	⊂B⊃	■	⊂D⊃	⊂E⊃
76	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
77	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
78	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
79	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
80	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
81	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
82	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
83	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
84	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
85	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
86	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
87	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
88	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
89	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
90	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
91	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
92	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
93	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
94	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
95	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
96	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
97	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
98	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
99	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃
100	⊂A⊃	⊂B⊃	⊂C⊃	⊂D⊃	⊂E⊃

RO

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

1 **ID: 2504667** **Points: 1.00**

Answer: A

2 **ID: 2495410** **Points: 1.00**

Answer: D

3 **ID: 2504125** **Points: 1.00**

Answer: B

4 **ID: 2495419** **Points: 1.00**

Answer: B

5 **ID: 2495367** **Points: 1.00**

Answer: A

6 **ID: 2495963** **Points: 1.00**

Answer: C

7 **ID: 2495161** **Points: 1.00**

Answer: D

8 **ID: 2495386** **Points: 1.00**

Answer: C

9 **ID: 2496014** **Points: 1.00**

Answer: A

10 **ID: 2507326** **Points: 1.00**

Answer: A

11 **ID: 2495420** **Points: 1.00**

Answer: B

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

12 **ID: 2495312** **Points: 1.00**

Answer: D

13 **ID: 2495713** **Points: 1.00**

Answer: C

14 **ID: 2507056** **Points: 1.00**

Answer: A

15 **ID: 2495354** **Points: 1.00**

Answer: D

16 **ID: 2495949** **Points: 1.00**

Answer: B

17 **ID: 2507161** **Points: 1.00**

Answer: B *Q17: Deleted

18 **ID: 2495937** **Points: 1.00**

Answer: A

19 **ID: 2495689** **Points: 1.00**

Answer: B

20 **ID: 2495854** **Points: 1.00**

Answer: B

21 **ID: 2495593** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

22 **ID: 2495739** **Points: 1.00**

Answer: A

23 **ID: 2507010** **Points: 1.00**

Answer: C

24 **ID: 2504584** **Points: 1.00**

Answer: D

25 **ID: 2495999** **Points: 1.00**

Answer: A

26 **ID: 2503044** **Points: 1.00**

Answer: A

27 **ID: 2495765** **Points: 1.00**

Answer: D

28 **ID: 2504248** **Points: 1.00**

Answer: C

29 **ID: 2495908** **Points: 1.00**

Answer: B

30 **ID: 2507074** **Points: 1.00**

Answer: B

31 **ID: 2495692** **Points: 1.00**

Answer: D

32 **ID: 2495660** **Points: 1.00**

Answer: B

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

33 **ID: 2507083** **Points: 1.00**

Answer: D

34 **ID: 2496054** **Points: 1.00**

Answer: A

35 **ID: 2496056** **Points: 1.00**

Answer: A

36 **ID: 2496021** **Points: 1.00**

Answer: B

37 **ID: 2495464** **Points: 1.00**

Answer: C

38 **ID: 2496046** **Points: 1.00**

Answer: D

39 **ID: 2496024** **Points: 1.00**

Answer: D

40 **ID: 2495352** **Points: 1.00**

Answer: A

41 **ID: 2507315** **Points: 1.00**

Answer: A

42 **ID: 2495486** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

43 **ID: 2495350** **Points: 1.00**

Answer: D

44 **ID: 2507328** **Points: 1.00**

Answer: C

45 **ID: 2495784** **Points: 1.00**

Answer: D

46 **ID: 2495760** **Points: 1.00**

Answer: A *Q46: Both A and B are accepted as correct

47 **ID: 2495580** **Points: 1.00**

Answer: D

48 **ID: 2495297** **Points: 1.00**

Answer: C

49 **ID: 2507320** **Points: 1.00**

Answer: C

50 **ID: 2495415** **Points: 1.00**

Answer: C

51 **ID: 2495616** **Points: 1.00**

Answer: D

52 **ID: 2504703** **Points: 1.00**

Answer: B

53 **ID: 2504676** **Points: 1.00**

Answer: C

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

54 **ID: 2505242** **Points: 1.00**

Answer: C

55 **ID: 2495795** **Points: 1.00**

Answer: B

56 **ID: 2496003** **Points: 1.00**

Answer: D

57 **ID: 2495505** **Points: 1.00**

Answer: C

58 **ID: 2495997** **Points: 1.00**

Answer: D

59 **ID: 2495691** **Points: 1.00**

Answer: A

60 **ID: 2495681** **Points: 1.00**

Answer: B

61 **ID: 2507300** **Points: 1.00**

Answer: D

62 **ID: 2495832** **Points: 1.00**

Answer: D

63 **ID: 2500131** **Points: 1.00**

Answer: A

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

64 **ID: 2496049** **Points: 1.00**

Answer: B

65 **ID: 2495390** **Points: 1.00**

Answer: D

66 **ID: 2495353** **Points: 1.00**

Answer: C

67 **ID: 2495669** **Points: 1.00**

Answer: B

68 **ID: 2496033** **Points: 1.00**

Answer: B

69 **ID: 2495873** **Points: 1.00**

Answer: A

70 **ID: 2495357** **Points: 1.00**

Answer: C

71 **ID: 2505274** **Points: 1.00**

Answer: D

72 **ID: 2495430** **Points: 1.00**

Answer: D

73 **ID: 2495996** **Points: 1.00**

Answer: A

74 **ID: 2495174** **Points: 1.00**

Answer: B

Test Answer Key (Answers Only)

LGS 2023 RO Exam
Test ID: 374919

75 **ID: 2504247** **Points: 1.00**

Answer: C

Form 4.1-BWR Boiling-Water Reactor Examination Outline

Facility: Limerick	**K/A Catalog Rev. 3**	**Rev.** FINAL	**Date of Exam:** 12/4/2023

Tier	Group	RO K/A Category Points												**SRO-Only Points**				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	**A2**		**G***		**Total**
1. Emergency and Abnormal Plant Evolutions	1	3	3	3				3	4			4	20	**4**		**3**		**7**
	2	1	1	1				1	1			1	6	**1**		**2**		**3**
	Tier Totals	4	4	4				4	5			5	26	**5**		**5**		**10**
2. Plant Systems	1	2	3	2	2	2	2	3	3	2	3	2	26	**2**		**3**		**5**
	2	2	1	1	1	1	1	1	1	1	0	1	11	**0**	**2**	**1**		**3**
	Tier Totals	4	4	3	3	3	3	4	4	3	3	3	37	**4**		**4**		**8**

3. Generic Knowledge and Abilities Categories	CO	EC	RC	EM	6	**CO**	**EC**	**RC**	**EM**	**7**
	2	2	1	1		**2**	**2**	**1**	**2**	

4. Theory	Reactor Theory	Thermodynamics	6	
	3	3		

Notes: CO = Conduct of Operations; EC = Equipment Control; RC = Radiation Control;
EM = Emergency Procedures/Plan

* These systems/evolutions may be eliminated from the sample when Revision 2 of the K/A catalog is used to develop the sample plan.

** These systems/evolutions are only included as part of the sample (as applicable to the facility) when Revision 2 of the K/A catalog is used to develop the sample plan.

ES-4.1-BWR BWR Examination Outline (Limerick)

Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/**SRO**)

Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
1	(295001) (APE 1) PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION				X			(295001AA1.01) Ability to operate or monitor the following as they apply to (APE 1) PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: (CFR: 41.5 / 41.7 / 45.5 to 45.8) Recirculation system	4	33
2	(295003) (APE 3) PARTIAL OR COMPLETE LOSS OF AC POWER				X			(295003AA1.06) Ability to operate or monitor the following as they apply to (APE 3) PARTIAL OR COMPLETE LOSS OF AC POWER: (CFR: 41.5 / 41.7 / 45.5 to 45.8) AC electrical loads	3.8	44
3	(295004) (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER					X		(295004AA2.01) Ability to determine or interpret the following as they apply to (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER: (CFR: 41.10 / 43.5 / 45.13) Partial or complete loss of DC power	4	74
4	(295005) (APE 5) MAIN TURBINE GENERATOR TRIP			X				(295005AK3.07) Knowledge of the reasons for the following responses or actions as they apply to (APE 5) MAIN TURBINE GENERATOR TRIP: (CFR: 41.5 / 41.10 / 45.6 / 45.13) Turbine bypass valve operation	3.9	7
5	(295006) (APE 6) SCRAM	X						(295006AK1.04) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (APE 6) SCRAM: (CFR: 41.5 / 41.7 / 45.7 / 45.8) Pressure control	4.1	48
6	(295016) (APE 16) CONTROL ROOM ABANDONMENT					X		(295016AA2.02) Ability to determine or interpret the following as they apply to (APE 16) CONTROL ROOM ABANDONMENT: (CFR: 41.10 / 43.5 / 45.13) Reactor water level	4.5	17
7	(295018) (APE 18) PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW)						X	(295018) (APE 18) PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW) (G2.1.19) CONDUCT OF OPERATIONS Ability to use available indications to evaluate system or component status (CFR: 41.10 / 45.12)	3.9	12
8	(295019) (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR				X			(295019AA1.02) Ability to operate or monitor the following as they apply to (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: (CFR: 41.5 / 41.7 / 45.5 to 45.8) System valves	3.2	43
9	(295021) (APE 21) LOSS OF SHUTDOWN COOLING					X		(295021AA2.04) Ability to determine or interpret the following as they apply to (APE 21) LOSS OF SHUTDOWN COOLING: (CFR: 41.10 / 43.5 / 45.13) Reactor water temperature	4.6	15
10	(295023) (APE 23) REFUELING ACCIDENTS						X	(295023) (APE 23) REFUELING ACCIDENTS (G2.4.17) EMERGENCY PROCEDURES / PLAN Knowledge of emergency and abnormal operating procedures terms and definitions (CFR: 41.10 / 45.13)	3.9	40
11	(295024) (EPE 1) HIGH DRYWELL PRESSURE	X						(295024EK1.01) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 1) HIGH DRYWELL PRESSURE: (CFR: 41.5 / 41.7 / 45.7 / 45.8) Drywell integrity	4.3	66
12	(295025) (EPE 2) HIGH REACTOR PRESSURE					X		(295025EA2.04) Ability to determine or interpret the following as they apply to (EPE 2) HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13) Suppression pool level	4	70
13	(295026) (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE		X					(295026EK2.07) Knowledge of the relationship between the (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE and the following systems or components: (CFR: 41.8 / 41.10 / 45.3) HPCI	3.8	5

14	(295028) (EPE 5) HIGH DRYWELL TEMPERATURE (MARK I AND MARK II ONLY)	X						(295028EK1.05) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 5) HIGH DRYWELL TEMPERATURE (MARK I AND MARK II ONLY): (CFR: 41.5 / 41.7 / 45.7 / 45.8) High drywell pressure	3.8	8
15	(295030) (EPE 7) LOW SUPPRESSION POOL WATER LEVEL			X				(295030EK3.02) Knowledge of the reasons for the following responses or actions as they apply to (EPE 7) LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.5 / 41.10 / 45.6 / 45.13) HPCI shutdown	4	65
16	(295031) (EPE 8) REACTOR LOW WATER LEVEL			X				(295031EK3.04) Knowledge of the reasons for the following responses or actions as they apply to (EPE 8) REACTOR LOW WATER LEVEL: (CFR: 41.5 / 41.10 / 45.6 / 45.13) Steam cooling	4.3	24
17	(295037) (EPE 14) SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN						X	(295037) (EPE 14) SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN (G2.4.46) EMERGENCY PROCEDURES / PLAN Ability to verify that the alarms are consistent with the plant conditions (CFR: 41.10 / 43.5 / 45.3 / 45.12)	4.2	2
18	(295038) (EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE						X	(295038) (EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE (G2.4.18) EMERGENCY PROCEDURES / PLAN: Knowledge of the specific bases for emergency and abnormal operating procedures (CFR: 41.10 / 43.1 / 45.13)	3.3	50
19	(600000) (APE 24) PLANT FIRE ON SITE		X					(600000AK2.11) Knowledge of the relationship between the (APE 24) PLANT FIRE ON SITE and the following systems or components: (CFR: 41.8 / 41.10 / 45.3) Fire pumps	3.8	4
20	(700000) (APE 25) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES		X					(700000AK2.10) Knowledge of the relationship between the (APE 25) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following systems or components: (CFR: 41.8 / 41.10 / 45.3) Emergency generators (diesel/jet)	3.9	72
21	**(295004) (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER**					**X**		**(295004AA2.04) Ability to determine or interpret the following as they apply to (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER: (CFR: 41.10 / 43.5 / 45.13) System lineups**	**3.5**	**88**
22	**(295019) (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR**					**X**		**(295019AA2.01) Ability to determine or interpret the following as they apply to (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: (CFR: 41.10 / 43.5 / 45.13) Instrument air pressure**	**3.9**	**85**
23	**(295024) (EPE 1) HIGH DRYWELL PRESSURE**						**X**	**(295024) (EPE 1) HIGH DRYWELL PRESSURE EMERGENCY PROCEDURES/PLAN (G2.4.20) Knowledge of the operational implications of emergency and abnormal operating procedures warnings, cautions, and notes (CFR: 41.10 / 43.5 / 45.13)**	**3.8**	**89**
24	**(295025) (EPE 2) HIGH REACTOR PRESSURE**					**X**		**(295025EA2.01) Ability to determine or interpret the following as they apply to (EPE 2) HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13) Reactor pressure**	**4.7**	**91**
25	**(295026) (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE**						**X**	**(295026) (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE (G2.1.9) CONDUCT OF OPERATIONS Ability to direct licensed personnel activities inside the control room (SRO Only) (CFR: 43.1 / 45.5 / 45.12 / 45.13)**	**4.5**	**93**
26	**(295030) (EPE 7) LOW SUPPRESSION POOL WATER LEVEL**					**X**		**(295030EA2.05) Ability to determine or interpret the following as they apply to (EPE 7) LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.10 / 43.5 / 45.13) ECCS/RCIC pump flow**	**3.4**	**81**

27	**(295038) (EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE**						**X**	**(295038) (EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE (G2.4.16) EMERGENCY PROCEDURES / PLAN Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, or severe accident management guidelines (CFR: 41.10 / 43.5 / 45.13)**	**4.4**	**96**
	(295027) (EPE 4) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY) / 5									
K/A Category Totals:		3	3	3	3	8	7	Group Point Total:		27

ES-4.1-BWR BWR Examination Outline (Limerick)

Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/**SRO**)

Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
28	(295008) (APE 8) HIGH REACTOR WATER LEVEL					X		(295008AA2.02) Ability to determine or interpret the following as they apply to (APE 8) HIGH REACTOR WATER LEVEL: (CFR: 41.10 / 43.5 / 45.13) Steam flow/feedflow mismatch	3.9	11
29	(295013) (APE 13) HIGH SUPPRESSION POOL TEMPERATURE.				X			(295013AA1.01) Ability to operate or monitor the following as they apply to (APE 13) HIGH SUPPRESSION POOL TEMPERATURE.: (CFR: 41.5 / 41.7 / 45.5 to 45.8) Suppression pool cooling	4.3	61
30	(295017) (APE 17) ABNORMAL OFFSITE RELEASE RATE			X				(295017AK3.04) Knowledge of the reasons for the following responses or actions as they apply to (APE 17) ABNORMAL OFFSITE RELEASE RATE: (CFR: 41.5 / 41.10 / 45.6 / 45.13) Power reduction	3.7	37
31	(295020) (APE 20) INADVERTENT CONTAINMENT ISOLATION						X	(295020) (APE 20) INADVERTENT CONTAINMENT ISOLATION (G2.1.45) CONDUCT OF OPERATIONS Ability to identify and interpret diverse indications to validate the response of another indication (CFR: 41.7 / 43.5 / 45.4)	4.3	42
32	(295033) (EPE 10) HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS		X					(295033EK2.02) Knowledge of the relationship between the (EPE 10) HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following systems or components: (CFR: 41.8 / 41.10 / 45.3) Process radiation monitoring system	3.5	57
33	(295002) (APE 2) LOSS OF MAIN CONDENSER VACUUM / 3	X						(295002EK1.04) Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Loss of Main Condenser Vacuum: (CFR: 41.8 to 41.10) Offgas flow changes	3.4	49
34	**(295010) (APE 10) HIGH DRYWELL PRESSURE**						**X**	**(295010) (APE 10) HIGH DRYWELL PRESSURE (G2.2.44) EQUIPMENT CONTROL: Ability to interpret control room indications to verify the status and operation of a system and understand how operator actions and directives affect plant and system conditions (CFR: 41.5 / 43.5 / 45.12)**	**4.4**	**97**
35	**(295034) (EPE 11) SECONDARY CONTAINMENT VENTILATION HIGH RADIATION**						**X**	**(295034) (EPE 11) SECONDARY CONTAINMENT VENTILATION HIGH RADIATION (G2.4.29) EMERGENCY PROCEDURES / PLAN Knowledge of the emergency plan implementing procedures (CFR: 41.10 / 43.5 / 45.11)**	**4.4**	**83**
36	**(500000) (EPE 16) HIGH CONTAINMENT HYDROGEN CONCENTRATION**					**X**		**(500000EA2.05) Ability to determine or interpret the following as they apply to (EPE 16) HIGH CONTAINMENT HYDROGEN CONCENTRATION: (CFR: 41.10 / 43.5 / 45.13) Hydrogen concentration limits for containment**	**3.9**	**78**
	(295035) (EPE 12) SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE									
	(295007) (APE 7) HIGH REACTOR PRESSURE / 3									
	(295009) (APE 9) LOW REACTOR WATER LEVEL / 2									

	(295011) (APE 11) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY) / 5									
	(295012) (APE 12) HIGH DRYWELL TEMPERATURE / 5									
	(295014) (APE 14) INADVERTENT REACTIVITY ADDITION / 1									
	(295022) (APE 22) LOSS OF CONTROL ROD DRIVE PUMPS / 1									
	(295029) (EPE 6) HIGH SUPPRESSION POOL WATER LEVEL / 5									
	(295032) (EPE 9) HIGH SECONDARY CONTAINMENT AREA TEMPERATURE / 5									
	(295036) (EPE 13) SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL / 5									
K/A Category Totals:		1	1	1	1	2	3	Group Point Total:		9

ES-4.1-BWR BWR Examination Outline (Limerick)

Plant Systems—Tier 2/Group 1 (RO/**SRO**)

Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
37	(203000) (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE									X			(203000A3.01) Ability to monitor automatic operation of the (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE including: (CFR: 41.7 / 45.7) Valve operation	4	47
38	(203000) (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE		X										(203000K2.03) (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE Knowledge of electrical power supplies to the following: (CFR: 41.7) Initiation logic	3.7	21
39	(205000) (SF4 SCS) SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE)	X											(205000K1.15) Knowledge of the physical connections and/or cause and effect relationships between the (SF4 SCS) SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Service water	3.2	51
40	(206000) (SF2, SF4 HPCI) HIGH PRESSURE COOLANT INJECTION SYSTEM											X	(206000) (SF2, SF4 HPCI) HIGH PRESSURE COOLANT INJECTION SYSTEM (G2.2.22) EQUIPMENT CONTROL Knowledge of limiting conditions for operation and safety limits (CFR: 41.5 / 43.2 / 45.2)	4.0	32
41	(206000) (SF2, SF4 HPCI) HIGH PRESSURE COOLANT INJECTION SYSTEM		X										(206000K2.02) (SF2, SF4 HPCI) HIGH PRESSURE COOLANT INJECTION SYSTEM Knowledge of electrical power supplies to the following: (CFR: 41.7) Pumps	3.2	67
42	(209001) (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM						X						(209001K6.01) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM : (CFR: 41.7 / 45.7) Loss of AC electrical distribution system	4.2	52
43	(211000) (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM										X		(211000A4.06) Ability to manually operate and/or monitor the (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM in the control room: (CFR: 41.7 / 45.5 to 45.8) RWCU system isolation	4	60
44	(212000) (SF7 RPS) REACTOR PROTECTION SYSTEM										X		(212000A4.04) Ability to manually operate and/or monitor the (SF7 RPS) REACTOR PROTECTION SYSTEM in the control room: (CFR: 41.7 / 45.5 to 45.8) Bypass SCRAM signals	3.7	53

45	(215003) (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM							X					(215003A1.04) Ability to predict and/or monitor changes in parameters associated with operation of the (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM including: (CFR: 41.5 / 45.5) Control rod block status	3.9	19
46	(215004) (SF7 SRMS) SOURCE RANGE MONITOR SYSTEM			X									(215004K3.02) Knowledge of the effect that a loss or malfunction of the (SF7 SRMS) SOURCE RANGE MONITOR SYSTEM will have on the following systems or system parameters: (CFR: 41.7 / 45.4) RMCS (BWR 2, 3, 4, 5)	3.5	59
47	(215005) (SF7 PRMS) AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR								X				(215005A2.13) Ability to (a) predict the impacts of the following on the (SF7 PRMS) AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Thermal-hydraulic instability	4.0	31
48	(217000) (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM									X			(217000A3.02) Ability to monitor automatic operation of the (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM including: (CFR: 41.7 / 45.7) Turbine startup	4	63
49	(218000) (SF3 ADS) AUTOMATIC DEPRESSURIZATION SYSTEM										X		(218000A4.03) Ability to manually operate and/or monitor the (SF3 ADS) AUTOMATIC DEPRESSURIZATION SYSTEM in the control room: (CFR: 41.7 / 45.5 to 45.8) ADS logic reset	3.9	13
50	(223002) (SF5 PCIS) PRIMARY CONTAINMENT ISOLATION SYSTEM / NUCLEAR STEAM SUPPLY SHUTOFF											X	(223002) (SF5 PCIS) PRIMARY CONTAINMENT ISOLATION SYSTEM / NUCLEAR STEAM SUPPLY SHUTOFF (291002K1.05) SENSORS AND DETECTORS (CFR: 41.7) Operation of a flow D/P cell-type flow detector	3.1	23
51	(259002) (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM	X											(259002K1.01) Knowledge of the physical connections and/or cause and effect relationships between the (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) RPS	3.9	22
52	(259002) (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM			X									(259002K3.02) Knowledge of the effect that a loss or malfunction of the (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM will have on the following systems or system parameters: (CFR: 41.7 / 45.4) Feedwater system	4	28

53	(261000) (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM							X					(261000A1.04) Ability to predict and/or monitor changes in parameters associated with operation of the (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM including: (CFR: 41.5 / 45.5) Secondary containment differential pressure	3.7	71
54	(261000) (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM				X								(261000K4.05) Knowledge of (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM design features and/or interlocks that provide for the following: (CFR: 41.7) Fission product gas removal	3.3	46
55	(262001) (SF6 AC) AC ELECTRICAL DISTRIBUTION					X							(262001K5.02) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF6 AC) AC ELECTRICAL DISTRIBUTION: (CFR: 41.5 / 45.3) Breaker control power	3.5	27
56	(262002) (SF6 UPS) UNINTERRUPTABLE POWER SUPPLY (AC/DC)		X										(262002K2.01) (SF6 UPS) UNINTERRUPTABLE POWER SUPPLY (AC/DC) Knowledge of electrical power supplies to the following: (CFR: 41.7) Static Switch/Inverter	3.3	45
57	(263000) (SF6 DC) DC ELECTRICAL DISTRIBUTION				X								(263000K4.03) Knowledge of (SF6 DC) DC ELECTRICAL DISTRIBUTION design features and/or interlocks that provide for the following: (CFR: 41.7) Ground detection	2.9	55
58	(264000) (SF6 EGE) EMERGENCY GENERATORS (DIESEL/JET)								X				(264000A2.09) Ability to (a) predict the impacts of the following on the (SF6 EGE) EMERGENCY GENERATORS (DIESEL/JET) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Loss of a safety bus	4.7	75
59	(300000) (SF8 IA) INSTRUMENT AIR SYSTEM						X						(300000K6.14) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF8 IA) INSTRUMENT AIR SYSTEM: (CFR: 41.7 / 45.7) Component cooling water system	3.1	62
60	(400000) (SF8 CCS) COMPONENT COOLING WATER SYSTEM							X					(400000A1.03) Ability to predict and/or monitor changes in parameters associated with operation of the (SF8 CCS) COMPONENT COOLING WATER SYSTEM including: (CFR: 41.5 / 45.5) CCW pressure	3	54

61	(400000) (SF8 CCS) COMPONENT COOLING WATER SYSTEM					X							(400000K5.02) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF8 CCS) COMPONENT COOLING WATER SYSTEM : (CFR: 41.5 / 45.3) Determine source(s) of RCS leakage into CCW	3.1	20
62	(510000) (SF4 SWS*) SERVICE WATER SYSTEM								X				(510000A2.01) Ability to (a) predict the impacts of the following on the (SF4 SWS*) SERVICE WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Pump/motor failure	3.6	69
63	**(209001) (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM**											**X**	**(209001) (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM (G2.2.5) EQUIPMENT CONTROL Knowledge of the process for making design or operating changes to the facility, such as 10 CFR 50.59, "Changes, Tests and Experiments," screening and evaluation processes, administrative processes for temporary modifications, disabling annunciators, or installation of temporary equipment (CFR: 41.10 / 43.3 / 45.13)**	**3.2**	**84**
64	**(211000) (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM**											**X**	**(211000) (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM (G2.2.12) EQUIPMENT CONTROL Knowledge of surveillance procedures (CFR: 41.10 / 43.2 / 45.13)**	**4.1**	**80**
65	**(212000) (SF7 RPS) REACTOR PROTECTION SYSTEM**											**X**	**(212000) (SF7 RPS) REACTOR PROTECTION SYSTEM (G2.4.12) EMERGENCY PROCEDURES / PLAN Knowledge of operating crew responsibilities during emergency and abnormal operations (CFR: 41.10 / 45.12)**	**4.3**	**95**
66	**(239002) (SF3 SRV) SAFETY RELIEF VALVES**								**X**				**(239002A2.03)Ability to (a) predict the impacts of the following on the Safety Relief Valves and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) Stuck-open SRV**	**4.4**	**99**

67	**(510000) (SF4 SWS*) SERVICE WATER SYSTEM**								**X**				**(510000A2.07) Ability to (a) predict the impacts of the following on the (SF4 SWS*) SERVICE WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Abnormal intake water temperature**	**3.6**	**77**
	(207000) (SF4 IC) ISOLATION (EMERGENCY) CONDENSER														
	(209002) (SF2, SF4 HPCS) HIGH PRESSURE CORE SPRAY SYSTEM														
	(215004) (SF7 SRMS) SOURCE RANGE MONITOR SYSTEM														
K/A Category Totals:		2	3	2	2	2	2	3	5	2	3	5	Group Point Total:		31

ES-4.1-BWR BWR Examination Outline (Limerick)

Plant Systems—Tier 2/Group 2 (RO/**SRO**)

Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
68	(201006) (SF7 RWMS) ROD WORTH MINIMIZER SYSTEM									X			(201006A3.06) Ability to monitor automatic operation of the (SF7 RWMS) ROD WORTH MINIMIZER SYSTEM including: (CFR: 41.7 / 45.7) System bypass	3.3	1
69	(214000) (SF7 RPIS) ROD POSITION INFORMATION SYSTEM	X											(214000K1.03) Knowledge of the physical connections and/or cause and effect relationships between the (SF7 RPIS) ROD POSITION INFORMATION SYSTEM and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Control rod drive mechanism	3.3	29
70	(216000) (SF7 NBI) NUCLEAR BOILER INSTRUMENTATION						X						(216000K6.07) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF7 NBI) NUCLEAR BOILER INSTRUMENTATION: (CFR: 41.7 / 45.7) Loss of a recirculation pump	3.1	3
71	(223001) (SF5 PCS) PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES					X							(223001K5.12) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF5 PCS) PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES: (CFR: 41.5 / 45.3) Hydrogen concentration	3.8	18
72	(226001) (SF5 RHR CSS) RHR/LPCI: CONTAINMENT SPRAY MODE SYSTEM MODE			X									(226001K3.01) Knowledge of the effect that a loss or malfunction of the (SF5 RHR CSS) RHR/LPCI: CONTAINMENT SPRAY MODE SYSTEM MODE will have on the following systems or system parameters: (CFR: 41.7 / 45.4) Containment/drywell/suppression chamber pressure	4.3	16
73	(239001) (SF3, SF4 MRSS) MAIN AND REHEAT STEAM SYSTEM	X											(239001K1.01) Knowledge of the physical connections and/or cause and effect relationships between the (SF3, SF4 MRSS) MAIN AND REHEAT STEAM SYSTEM and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Reactor vessel and internals	3.5	6
74	(245000) (SF4 MTGEN) MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS				X								(245000K4.02) Knowledge of (SF4 MTGEN) MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS design features and/or interlocks that provide for the following: (CFR: 41.7) Generator cooling	3.1	73

75	(271000) (SF9 OG) OFFGAS SYSTEM							X				(271000A1.09) Ability to predict and/or monitor changes in parameters associated with operation of the (SF9 OG) OFFGAS SYSTEM including: (CFR: 41.5 / 45.5) Charcoal bed temperature	2.7	58
76	(286000) (SF8 FPS) FIRE PROTECTION SYSTEM										X	(286000) (SF8 FPS) FIRE PROTECTION SYSTEM (G2.4.26) EMERGENCY PROCEDURES/PLAN Knowledge of facility protection requirements, including fire brigade and portable firefighting equipment usage (CFR: 41.10 / 43.5 / 45.12)	3.1	25
77	(288000) (SF9 PVS) PLANT VENTILATION SYSTEMS		X									(288000K2.02) (SF9 PVS) PLANT VENTILATION SYSTEMS Knowledge of electrical power supplies to the following: (CFR: 41.7) Auxiliary building supply and exhaust fans (turbine building/radwaste building)	2.6	30
78	(510001) (SF8 CWS*) CIRCULATING WATER SYSTEM								X			(510001A2.01) Ability to (a) predict the impacts of the following on the (SF8 CWS*) CIRCULATING WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Pump/Motor failure	3.5	56
79	**(290003) (SF9 CRV) CONTROL ROOM VENTILATION**										**X**	**(290003) (SF9 CRV) CONTROL ROOM VENTILATION (G2.2.21) EQUIPMENT CONTROL Knowledge of pre- and post-maintenance operability requirements (CFR: 41.10 / 43.2)**	**4.1**	**98**
80	**(215001) (SF7 TIP) TRAVERSING IN CORE PROBE**								**X**			**(215001A2.06) Ability to (a) predict the impacts of the following on the (SF7 TIP) TRAVERSING IN CORE PROBE and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) Abnormal valve position (BWR 2, 3, 4, 5)**	**3.1**	**76**
81	**(230000) (SF5 RHR SPS) RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE**								**X**			**(230000A2.05) Ability to (a) predict the impacts of the following on the (SF5 RHR SPS) RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6) AC electrical failures**	**3.8**	**82**

	(201002) (SF1 RMCS) REACTOR MANUAL CONTROL SYSTEM														
	(201003) (SF1 CRDM) CONTROL ROD AND DRIVE MECHANISM														
	(201004) (SF7 RSCS) ROD SEQUENCE CONTROL SYSTEM														
	(201005) (SF1, SF7 RCIS) ROD CONTROL AND INFORMATION SYSTEM														
	(202001) (SF1, SF4 RS) RECIRCULATION SYSTEM														
	(202002) (SF1 RSCTL) RECIRCULATION FLOW CONTROL SYSTEM														
	(204000) (SF2 RWCU) REACTOR WATER CLEANUP SYSTEM														
	(215002) (SF7 RBMS) ROD BLOCK MONITOR SYSTEM														
	(219000) (SF5 RHR SPC) RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE														
	(233000) (SF9 FPCCU) FUEL POOL COOLING/CLEANUP														
	(234000) (SF8 FH) FUEL HANDLING														
	(239003) (SF9 MSVLCS) MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM														
	(241000) (SF3 RTPRS) REACTOR/TURBINE PRESSURE REGULATING SYSTEM														
	(256000) (SF2 CDS) CONDENSATE SYSTEM														
	(259001) (SF2 FWS) FEEDWATER SYSTEM														
	(268000) (SF9 RW) RADWASTE SYSTEM														

	(272000) (SF7, SF9 RMS) RADIATION MONITORING SYSTEM														
	(290001) (SF5 SC) SECONDARY CONTAINMENT														
	(290002) (SF4 RVI) REACTOR VESSEL INTERNALS														
	(201001) (SF1 CRDH) CRD HYDRAULIC SYSTEM														
K/A Category Totals:		2	1	1	1	1	1	1	3	1	0	2	Group Point Total:		14

Form 4.1-COMMON Common Examination Outline

Generic Knowledge and Abilities Outline (Tier 3) (RO/SRO)							
				RO		SRO-Only	
Category	K/A #	Topic	Item #	IR	Q#	IR	Q#
1. Conduct of Operations	G2.1.32	(G2.1.32) CONDUCT OF OPERATIONS Ability to explain and apply system precautions, limitations, notes, or cautions (CFR: 41.10 / 43.2 / 45.12)	82	3.8	9		
	G2.1.37	(G2.1.37) CONDUCT OF OPERATIONS Knowledge of procedures, guidelines, or limitations associated with reactivity management (CFR: 41.1 / 41.5 / 41.10 / 43.6 / 45.6)	83	4.3	36		
	G2.1.42	**(G2.1.42) CONDUCT OF OPERATIONS Knowledge of new and spent fuel movement procedures (SRO Only) (CFR: 43.7 / 45.13)**	**84**			**3.4**	**90**
	G2.1.6	**(G2.1.6) CONDUCT OF OPERATIONS Ability to manage the control room crew during plant transients (SRO Only) (CFR: 43.5 / 45.12 / 45.13)**	**85**			**4.8**	**92**
	Subtotal			N/A	2	N/A	**2**
2. Equipment Control	G2.2.14	(G2.2.14) EQUIPMENT CONTROL Knowledge of the process for controlling equipment configuration or status (CFR: 41.10 / 43.3 / 45.13)	86	3.9	39		
	G2.2.2	(G2.2.2) EQUIPMENT CONTROL Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels(CFR: 41.6 / 41.7 / 45.2)	87	4.6	68		
	G2.2.6	**(G2.2.6) EQUIPMENT CONTROL Knowledge of the process for making changes to procedures (CFR: 41.10 / 43.3 / 45.13)**	**88**			**3.6**	**100**
	G2.2.38	**(G2.2.38) EQUIPMENT CONTROL Knowledge of conditions and limitations in the facility license (CFR: 41.7 / 41.10 / 43.1 / 45.13)**	**89**			**4.5**	**79**
	Subtotal			N/A	2	N/A	**2**
3. Radiation Control	G2.3.5	(G2.3.5) RADIATION CONTROL Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms or personnel monitoring equipment (CFR: 41.11 / 41.12 / 43.4 / 45.9)	90	2.9	10		
	G2.3.11	**(G2.3.11) Ability to control radiation releases (CFR: 41.11 / 43.4 / 45.10)**	**91**			**4.3**	**86**
	Subtotal			N/A	1	N/A	**1**
4. Emergency Procedures / Plan	G2.4.14	(G2.4.14) EMERGENCY PROCEDURES / PLAN Knowledge of general guidelines for emergency and abnormal operating procedures usage (CFR: 41.10 / 43.1 / 45.13)	92	3.8	14		
	G2.4.47	**(G2.4.47) EMERGENCY PROCEDURES / PLAN Ability to diagnose and recognize trends in an accurate and timely manner using the appropriate control room reference material (reference potential) (CFR: 41.10 / 43.5 / 45.12)**	**93**			**4.2**	**87**
	G2.4.37	**(G2.4.37) EMERGENCY PROCEDURES / PLAN Knowledge of the lines of authority during implementation of the emergency plan implementing procedures (CFR: 41.10 / 45.13)**	**94**			**4.1**	**94**
	Subtotal			N/A	1	N/A	**2**
Tier 3 Point Total				N/A	6	N/A	**7**

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON	COMMON Examination Outline (Limerick)				
Facility: Limerick				Date of Exam: 12/4/2023	
Theory (Tier 4) (RO)					
				RO	
Category	K/A #	Topic	Item #	IR	Q#
Reactor Theory	292001	(292001K1.02) NEUTRONS (CFR: 41.1) Define prompt and delayed neutrons	95	3.1	38
	292004	(292004K1.10) REACTIVITY COEFFICIENTS (CFR: 41.1) Define the void coefficient of reactivity	96	3.2	26
	292005	(292005K1.01) CONTROL RODS (CFR: 41.1) Relate notch and rod position	97	3.3	64
	Subtotal				3
Thermodynamics	293006	(293006K1.14) FLUID STATICS AND DYNAMICS (CFR: 41.14) (PUMPS AND PUMP CHARACTERISTICS) Explain the results of putting centrifugal pumps in parallel or series combinations	98	2.7	34
	293007	(293007K1.13) HEAT TRANSFER (CFR: 41.14) (CORE THERMAL POWER) Calculate core thermal power using a simplified heat balance	99	2.9	35
	293009	(293009K1.43) CORE THERMAL LIMITS (CFR: 41.14) For the following plant operating or accident conditions, identify which of the three core thermal limits are most limiting: Cold Water Addition	100	3.4	41
	Subtotal				3
Tier 3 Point Total				N/A	6

Form 4.1-1 Record of Rejected Knowledge and Abilities

Refer to Examination Standard (ES)-4.2, “Developing Written Examinations,” Section B.3, for deviations from the approved written examination outline.

Tier/Group	Randomly Selected K/A	Reason for Rejection
1/1	295016 A2.07 Q17	There is no suppression chamber pressure detection at the RSP during control room abandonment. Randomly selected A2.02.
1/1	295038 G2.4.23 Q50	Overlap with Q96. Randomly selected G2.4.18.
1/1	295024 G2.4.2 Q89	This K/A is more suited for RO level knowledge. Randomly selected G2.4.20.
1/1	295021 AA2.06 Q15	Reactor pressure is oversampled. Randomly reselected AA2.04
1/2	295017 AK3.05 Q37	Overlap issue with other questions that are associated with offsite releases. Randomly selected AK3.04.
1/2	295010 G2.2.42 Q97	This K/A is more suited for RO level knowledge. Randomly selected G2.2.44.
2/1	206000 G2.2.40 Q32	No <1 hour TSs in HPCI. Randomly selected G2.2.22
2/1	291003 K1.04 Q23	There are no controllers or valves associated with NS^4. Randomly selected 291002 K1.05.
2/1	262002 K2.02 Q45	There is no motor generator for UPS at Limerick. Randomly selected K2.01.
2/1	264000 A2.08 Q75	There are no substantive RO actions associated with this K/A that would lead to a discriminating question. Randomly selected A2.09.
2/1	300000 K6.16 Q62	This K/A subject is too low of importance to be able to write a discriminating question. Randomly selected K6.14.
2/2	201006 A3.05 Q1	This K/A is not relevant at Limerick. Randomly selected A3.06

2/2	286000 G2.4.25 Q25	Overlap with Q4. Randomly selected G2.4.26.
2/2	(201001) (SF1 CRDH) CRD HYDRAULIC SYSTEM Q98	Cannot write a discriminating question, randomly selected (290003) (SF9 CRV) CONTROL ROOM VENTILATION
2/1	209001 K6.15 Q52	Cannot write a discriminating question, randomly selected K6.01
3	G2.3.14 Q86	Cannot write a discriminating question, randomly selected G2.3.11
2/1	215004 A2.04 Q99	Cannot write a question that is discriminating and at SRO level. Randomly selected 239002 A2.03
1/2	295033EK2.04 Q57	Standby Gas Treatment System (SGTS) is oversampled. Randomly selected K2.02
1/2	295035EK1.02 Q49	Secondary containment and SGTS are oversampled. Randomly selected (295002) (APE 2) LOSS OF MAIN CONDENSER VACUUM, K1.04
2/2	271000A1.11 Q58	Adjusted K/A to better match question as written. Changed A1.11 to A1.09
1/2	295013AA1.02 Q61	Cannot write a discriminating question. Randomly selected A1.01
2/1	510000A2.05 Q77	Cannot write a discriminating question. Randomly selected A2.07
4	293010K1.06 Q41	Cannot write a discriminating question. Randomly selected 293009 K1.43