# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

**1** **ID: 2164596** **Points: 1.00**

Unit 2 is operating at 70% Reactor Power.

- Both Reactor Recirc Pumps are running at 1250 RPM
- "2B" Reactor Recirc Pump (RRP) trips
- OT-112, "Unexpected/Unexplained Change in Core Flow" is entered

What action is required and the reason for that action?

A. Insert 8 control rods to prevent Thermal Hydraulic Instabilities (THI)

B. Close the RRP discharge valve and reopen 5 minutes later to allow the impeller to settle

C. Lower speed of the "2A" RRP to <1000 RPM to prevent reverse flow in the "B" Jet Pumps

D. Raise speed of "2A" RRP to 1500 RPM to minimize cooldown of the "B" Recirc Loop

Answer: B

**Answer Explanation**

OT-112 Rev 062
1.0 ENTRY CONDITIONS
1.1 **Recirc Pump trip(s) while Reactor Mode Switch is in "STARTUP" OR "RUN" position.**
1.2 Unexpected change in Recirc Pump Speed while Reactor Mode Switch is in "STARTUP" OR "RUN" position

**ATTACHMENT 1**
**Page 1 of 2**
**Trip of a Recirc Pump**

Find
Unexpecte

**NOTES**

- To prevent thermal binding/pressure locking, Recirc Pump isolation valves should **not** be closed for more than approximately 5 minutes. [ ]
- Maintaining Recirc loop isolation valves open with total core flow >40% of rated core flow will cause reverse flow through idle loop
  **AND** will keep idle loop warm. At lower flows, idle loop reverse flow will drop
  **AND** cool down will occur. [ ]

1. **ENSURE** OPEN **-BUS-03, "START A(B)" for the tripped Recirc Pump. [ ]
2. **CLOSE** HV-043-*F031A(B), "*A(B) Recirc Pump Disch Vlv" (DISCHARGE A(B))
   **OR** HV-043-*F023A(B), "*A(B) Recirc Pump Suction Vlv" (SUCTION A(B)), for tripped Recirc Pump. [ ]
3. **IF** Recirc Pump isolation valve is **not** required to be closed
   **AND** approximately 5 minutes has elapsed,
   **THEN OPEN** HV-043-*F031A(B), "*A(B) Recirc Pump Disch Vlv" (DISCHARGE A(B))
   **OR** HV-043-*F023A(B), "*A(B) Recirc Pump Suction Vlv" (SUCTION A(B)), for tripped Recirc Pump. [ ]

| | |
|---|---|
| **ANSWER (B)** | **Close the RRP discharge valve and reopen 5 minutes later to allow the impeller to settle; Correct:** As noted above, following a RRP trip, the discharge valve should be closed for 5 minutes to allow the impeller to settle and then re-opened to prevent thermal binding. . |
| **DISTRACTOR (A)** | **Insert 8 control rods to prevent Thermal Hydraulic Instabilities (THI); Wrong:** Plausible to the candidate that recalls that if initial power is >80%, 8 control rods should be inserted to help prevent THI. Initial power in this condition was 70%. . |
| **DISTRACTOR (C)** | **Lower speed of the "2A" RRP to <1000 RPM to prevent reverse flow in the "B" Jet Pumps; Wrong:** Plausible to the candidate who recalls that with recirc speed <1000 rpm, flow through the jet pumps is all forward flow. Not directed by the procedure |
| **DISTRACTOR (D)** | **Raise speed of "2A" RRP to 1500 RPM to minimize cooldown of the "B" Recirc Loop; Wrong:** Plausible to the candidate who recalls that single loop operation may require raising operating loop flow to maintain the idle loop temperature. In this case however 1500 RPM exceeds the single loop RRP operating speed limit of 1485 RPM of OT-112 and GP-15. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164596 |
| User-Defined ID: | Q #01 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Reduced Loop Operating Requirements Basis |
| 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 tests the operators knowledge of the plant response to a trip of an ASD which will result in a partial loss of forced circulation. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295001 AK3.05 3.2 |
| **KA Statement** | Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Reduced loop operating requirements: Plant-Specific |
| **Cognitive level** | HIGH |
| **Safety Function** | 1 - Reactivity Ctrl |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | OT-112 Rev 62 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0043A.LO13, LGSOPS0043B.LO10 |

**2** **ID: 2163839** **Points: 1.00**

Unit 1 is in a Station Blackout, with the following:

- HPCI and RCIC initiated on RPV low level.
- RPV level is recovering.
- E-1, "Loss of All AC Power (Station Blackout)" and T-101, "RPV Control" are being executed concurrently.

WHICH ONE of the following describes the required operator action per E-1?

A. Shutdown HPCI within 10 minutes of Station Blackout;
Transfer and maintain RCIC Pump suction to the Suppression Pool

B. Shutdown RCIC within 10 minutes of Station Blackout;
Transfer and maintain HPCI Pump suction to the Suppression Pool

C. Shutdown HPCI within 10 minutes of Station Blackout;
Maintain RCIC Pump suction aligned to the CST

D. Shutdown RCIC within 10 minutes of Station Blackout;
Maintain HPCI Pump suction aligned to the CST

Answer: A

**Answer Explanation**

E-1, step 2.1 directs operators to enter T-100/T-101 (RPV Control), as applicable, and execute it concurrently. Per step 3.1, if HPCI is automatically initiated, then HPCI shutdown per S55.2.A is to be completed within 10 minutes of the Station Blackout. The Limerick design basis for RPV water level control following a Station Blackout credits only the RCIC system for RPV level control since RCIC has sufficient capacity to maintain RPV inventory and HPCI capacity would result in exceeding the High RPV water level trip of +54 inches. Performance of S55.2.A returns the HPCI system to the auto/standby condition if the system has automatically initiated. Step 3.2 of E-1 provides direction to transfer and maintain RCIC suction to the Suppression Pool. The Limerick design basis for RPV level control for the four hour coping period following a Station Blackout credits the RCIC system in operation with suction from the Suppression Pool only. No credit is taken for the CST as a suction source for RCIC.

| | |
|---|---|
| **ANSWER (A)** | **Shutdown HPCI within 10 minutes of Station Blackout; Transfer and maintain RCIC Pump suction to the Suppression Pool. Correct.**<br>As reasons described above. |
| **DISTRACTOR (B)** | **Shutdown RCIC within 10 minutes of Station Blackout; Transfer and maintain HPCI Pump suction to the Suppression Pool. Wrong.**<br>Plausible to the examinee who incorrectly recalls E-1 requirements to secure HPCI and substitutes RCIC instead. Also plausible in that HPCI and RCIC share the same suction sources. |
| **DISTRACTOR (C)** | **Shutdown HPCI within 10 minutes of Station Blackout; Maintain RCIC Pump suction aligned to the CST. Wrong.**<br>Plausible to the examinee who recalls that HPCI must be shut down following a station blackout but who assumes that the CST is the preferred source for suction since that is true for power operation. Per the bases, this is not correct. |
| **DISTRACTOR (D)** | **Shutdown RCIC within 10 minutes of Station Blackout; Maintain HPCI Pump suction aligned to the CST. Wrong.**<br>Plausible to the examinee who incorrectly recalls E-1 requirements to secure HPCI and substitutes RCIC instead. Also plausible to the candidate who, assuming HPCI is running, wants to ensure that the cleanest water is used. Bases does not credit the CST for a station blackout. |

# 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: | 3 |
| Difficulty: | 0.00 |
| | |
| System ID: | 2163839 |
| User-Defined ID: | Q #02 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | E-1 Station Blackout - Recall operator actions |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295003 AK1/06<br>3.8/4.0 |
| **KA Statement** | Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: Station blackout: Plant-Specific. |
| **Cognitive level** | LOW |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | (CFR: 41.8 to 41.10) |
| **Technical Reference with Revision No:** | E-1, Rev.51; E-1 Bases, Rev.15 |
| **Question History: (i.e. LGS NRC-05)** | LGS 2012 NRC Exam Question #73, LGS ILT 15-1 COMP 2 |
| **Question Type: (New, Bank, Modified)** | BANK 1149992 |
| **Revision History:** | |
| **Training Objective** | LGSOPS |

**3** **ID: 2163841** **Points: 1.00**

Unit 1 plant conditions:

- 100% power
- '1A' CRD Pump is in service.

The following alarms are received:

- 121 G-1 1 UNIT DIV 3 SFGD BATTERY CHARGER TROUBLE
- 121 G-2 1PPC1/1PPC3 125V DC DIST PANELS UNDERVOLTAGE
- 121 G-3 1PPC2 125V DC DIST PANEL UNDERVOLTAGE

A LOCA occurs which results in reactor level lowering to -150".

Given: E-1FA, "Loss of Division 1 Safeguard 125/250V DC Bus 1FA"
E-1FC, "Loss of Division 3 Safeguard 125V DC Bus 1FC"

WHICH ONE of the following describes:

(1) The procedure(s) to be entered?
(2) The pump(s) that will be running following the LOCA signal?

| | (1) | (2) |
|---|---|---|
| A. | E-1FC Only | '1A' CRD |
| B. | E-1FC Only | '1C' Core Spray |
| C. | E-1FA, E-1FC | '1A' CRD |
| D. | E-1FA, E-1FC | '1C' Core Spray |

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **E-1FC, 1A CRD; Correct.** The annunciators provided in the stem are an indication of a loss of Division 3 DC. With Division 3 DC de-energized, 4KV breakers on the D13 Bus will lose control power. This will prevent the breakers from being operated remotely or automatically. Since the "1A" CRD Pump breaker was already closed, it will remain closed after the LOCA since it will be unable to automatically trip. |
| **DISTRACTOR (B)** | **E-1FC, 1C Core Spray; Wrong.** Plausible to the candidate that knows the '1A' CRD pump will normally trip on a LOCA signal and must be manually restarted, and that the '1C' Core Spray pump will normally start on a LOCA signal but has no control power in this instance.. |
| **DISTRACTOR (C)** | **E-1FA, E-1FC, 1A CRD; Wrong.** Plausible to the candidate that see the 1PPC1, 1PPC2 and 1PPC3 annunciators and associate them with Division 1 and 3 DC distribution panels. |
| **DISTRACTOR (D)** | **E-1FA, E-1FC, 1C Core Spray; Wrong.** Plausible to the candidate that see the 1PPC1, 1PPC2 and 1PPC3 annunciators and associate them with Division 1 and 3 DC distribution panels and who recalls that 1C C.S. pump would start on a LOCA signal but forgets that there is no control power. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
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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 |
| | |
| System ID: | 2163841 |
| User-Defined ID: | Q #03 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 Off Normal 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 AK2.03 3.3 |
| **KA Statement** | Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: D.C. bus loads. |
| **Cognitive level** | HIGH |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | (CFR: 41.7 / 45.8) |
| **Technical Reference with Revision No:** | E-1FC Rev 16<br>SE-10 Rev 61<br>S12.1.A App 2 Rev 1 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0092A.8 |

**4** **ID: 2163876** **Points: 1.00**

Unit 1 Plant Conditions are as follows:
- Reactor Startup is in progress.
- 1A RRP Speed is 466 RPM
- 1B RRP Speed is 466 RPM
- Main Generator is synchronized to the grid.
- Reactor power is 24%
- Reactor vessel pressure is 980 psig steady

Rising vibration on the Main Turbine requires operators to trip the turbine.

Six (6) Main Turbine Bypass valves are open.

Two (2) minutes later:
- Annunciator 106 Main Steam F5, "MINOR TROUBLE PRESS CONTROL" alarms.
- Annunciator 105 Main Turbine B3, "MINOR TROUBLE TURBINE CONTROL" alarms.
- Four (4) Main Turbine Bypass valves are open and not moving.
- RPV pressure is 1030 psig and rising slowly.

What action is required to mitigate the event?

A. Reduce reactor power by incrementally lowering RRP speed

B. Take manual control of pressure with the Bypass valve jack

C. Scram the reactor since it should have scrammed on turbine trip

D. Lower the Max Combined Flow Limit (MCFL) setpoint until it is in control of pressure

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **Take manual control of pressure with the Bypass valve jack; Correct:** OT-102, "Rx High Pressure", has immediate operator actions to control pressure below 1053 psig using the bypass jack due to an unexpected/unexplained rise in Rx pressure. A failure of the DEHC to control pressure is the most likely cause of this event. |
| **DISTRACTOR (A)** | **Reduce reactor power by incrementally lowering RRP speed; Wrong.** Lowering reactor power is an immediate operator action in OT-102, however in this case lowering RRP speed is not an option since the RRPs are already operating at minimum speed (466 RPM). |
| **DISTRACTOR (C)** | **Scram the reactor since it should have scrammed on turbine trip; Wrong:** Plausible to the candidate who believes that on a turbine trip, the Reactor should have scrammed based on 1st stage pressure. In this instance, power at 24% is below the power at which first stage pressure should cause that trip. |
| **DISTRACTOR (D)** | **Lower the Max Combined Flow Limit (MCFL) setpoint until it is in control of pressure; Wrong:**. Plausible to the candidate that infers that a DEHC regulator malfunction is the cause of this event and concludes that lowering MCFL would force DEHC to control. However, the MCFL is not user adjustable Also there is no procedural direction for this action. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 4 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 |
| | |
| System ID: | 2163876 |
| User-Defined ID: | Q #04 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Recognize Turbine Status from Annunciators |
| 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 the question posits a Main Turbine trip which results in rising Rx pressure. To answer the question, the candidate must use knowledge of OTs and DEHC and main turbine system. The answer is contained in an Operational Transient procedure as in immediate operator action. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295005 G2.4.31<br>4.2 |
| **KA Statement** | Main Turbine Generator Trip; Knowledge of annunciator alarms, indications, or response procedures. |
| **Cognitive level** | HIGH |
| **Safety Function** | 3 - Reactor Pressure Control |
| **10 CFR 55** | 41.10 / 45.3 |
| **Technical Reference with Revision No:** | OT-102 Rev.030 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS001A.3A, 5A, 5B |

**5** **ID: 2163899** **Points: 1.00**

Following a reactor scram ONE rod is at position "04" and all other rods are at position "00".

WHICH ONE of the following describes whether the reactor will remain shutdown?

A. Design basis shutdown margin is NOT met; therefore it CANNOT be assured that the reactor will remain shut down under all conditions.

B. Design basis shutdown margin is met; therefore the reactor will remain shut down under all conditions.

C. Control rods are inserted to or beyond the Maximum Sub-critical Banked Withdrawal limit; therefore the reactor will remain shut down under all conditions.

D. Control rods are NOT inserted to or beyond the Maximum Sub-critical Banked Withdrawal limit; therefore it CANNOT be assured the reactor will remain shut down under all conditions.

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **Design basis shutdown margin is met; therefore the reactor will remain shut down under all conditions;** Correct. Design basis shutdown margin is met, therefore the reactor will remain shut down under all conditions. IAW Tech Specs definition, "SHUTDOWN MARGIN shall be the amount of reactivity by which the reactor is subcritical or would be subcritical assuming all control rods are fully inserted except for the single control rod of highest reactivity worth is assumed to be fully withdrawn and the reactor is in the shutdown condition; cold, i.e. 68°F and xenon free" |
| **DISTRACTOR (A)** | **Design basis shutdown margin is NOT met; therefore it CANNOT be assured that the reactor will remain shut down under all conditions;** Wrong: Plausible to the candidate who does not believe that with a rod at position 04, shutdown margin is met. They would consequently not expect that the Rx would remain shut down under all conditions |
| **DISTRACTOR (C)** | **Control rods are inserted to or beyond the Maximum Sub-critical Banked Withdrawal limit; therefore the reactor will remain shut down under all conditions; Wrong:** Plausible to the candidate who recalls the definition of Maximum Subcritical Banked Withdrawal Position and incorrectly applies it to this condition. With one rod withdrawn to position 04 MSBWP is not met. |
| **DISTRACTOR (D)** | **Control rods are NOT inserted to or beyond the Maximum Sub-critical Banked Withdrawal limit; therefore it CANNOT be assured the reactor will remain shut down under all conditions;** Wrong. Plausible to the candidate who correctly recalls the definition of Maximum Sub-critical Banked Withdrawal Position and determines that it is not met in this case. That is true but the TS criteria for shutdown is the correct answer and in this instance, the Rx will remain shut down as TS assures. |

| **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 |
| | |
| System ID: | 2163899 |
| User-Defined ID: | Q #05 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of shutdown margin applied to scram |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | This question meets the KA because it requires the candidate have knowledge of the definition of shutdown margin as it applies to SCRAM conditions. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295006 AK1.02 3.4 |
| **KA Statement** | Knowledge of the operational implications of the following concepts as they apply to SCRAM: Shutdown margin. |
| **Cognitive level** | LOW |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.8 to 41.10 |
| **Technical Reference with Revision No:** | T-101 Bases RC-6 Rev 28 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (Hope Creek 2012 ILT Q40) |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.5 (T-101) |

**6** **ID: 2200036** **Points: 1.00**

The MCR has been evacuated and the Remote Shutdown Panel manned per SE-1, "Remote Shutdown"

- All transfer switches have been placed in Emergency.
- The RO is placing Unit 2 Shutdown Cooling in service at the Remote Shutdown Panel.
- The RHRSW Spray header return is to be swapped from Bypass to Spray.

WHICH ONE of the following describes the RHRSW pump to be used for Unit 2 Shutdown Cooling and the panel location to lineup RHRSW return header for Spray Pond Spray?

| | PUMP | SPRAY POND SPRAY Alignment |
|---|---|---|
| A. | '0A' RHRSW | From Unit 1 Remote S/D Panel |
| B. | '0A' RHRSW | From Unit 2 Remote S/D Panel |
| C. | '0C' RHRSW | From Unit 1 Remote S/D Panel |
| D. | '0C' RHRSW | From Unit 2 Remote S/D Panel |

Answer: C

**Answer Explanation**

| | |
|---|---|
| **ANSWER (C)** | **'C' RHRSW, From Unit 1 Remote S/D Panel; Correct:** C RHRSW is controlled from unit 2 RSP and would be placed in service to support unit 2 shutdown cooling. Both A and C RHRSW return header spray/spray bypass switches are controlled from the unit 1 remote shutdown panel. |
| **DISTRACTOR (A)** | **'A' RHRSW, From Unit 1 Remote S/D Panel; Wrong:** Plausible to the candidate who recalls that 0A RHRSW is controlled at the RSP and assumes it could be used for either unit. |
| **DISTRACTOR (B)** | **'A' RHRSW, From Unit 2 Remote S/D Panel; Wrong:** Plausible to the candidate who recalls that 0A RHRSW is controlled at the RSP and assumes it could be used for either unit. Also plausible misconception that Unit 2 S/D cooling lineup should be controlled from unit 2 RSP |
| **DISTRACTOR (D)** | **'C' RHRSW, From Unit 2 Remote S/D Panel; Wrong:** Plausible misconception that Unit 2 S/D cooling lineup should be controlled from unit 2 RSP |

# Test Answer Key

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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: | 4 |
| Difficulty: | 3.00 |
| | |
| System ID: | 2200036 |
| User-Defined ID: | Q #06 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Control Room Abandonment |
| 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** | 295016 G2.1.30 4.4 / 4.0 |
| **KA Statement** | **Control Room Abandonment**; Ability to locate and operate components, including local controls. |
| **Cognitive level** | Low |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | SE-1 Rev 76, |
| **Question History: (i.e. LGS NRC-05)** | 1151435 2016 LGS ILT |
| **Question Type: (New, Bank, Modified)** | Bank |
| **Revision History:** | |
| **Training Objective** | LGSOPS2000.4 |

**7** **ID: 2164096** **Points: 1.00**

Unit 2 is operating at 100% power with degraded RECW heat exchanger performance.

Unit 2 Non-Regenerative Heat Exchanger outlet temperatures were recorded as:

| Time | Temperature (TI-44-2R607) Channel 3 |
|---|---|
| T = 0 min | 120°F |
| T = 1 min | 122°F |
| T = 2 min | 124°F |

WHICH ONE of the following identifies (1) The automatic action that happens next; and

(2) At what time (from T=0) the automatic action will occur, assuming the current temperature trend continues?

| | 1 | 2 |
|---|---|---|
| A. | HV-044-2F004 Isolates | T = 10 min |
| B. | HV-044-2F004 Isolates | T = 5 min |
| C. | HV-044-2F001 Isolates | T = 10 min |
| D. | HV-044-2F001 Isolates | T = 5 min |

Answer: A

**Answer Explanation**

From ON-113, "Loss of RECW"

2.9 **IF** Reactor Water Cleanup (RWCU) Non-Regenerative Heat Exchanger outlet temperature reaches 140 °F, **THEN VERIFY** the following:

2.9.1 HV-044-*F004, "Rx Wtr Cleanup Outboard PCIV" (OUTBOARD), is closed

2.9.2 RWCU Pumps tripped

2.9.3 RWCU Demineralizer Hold Pumps start

| | |
|---|---|
| **ANSWER (A)** | **HV-044-2F004 Isolates, T = 10 min;** Correct. The next automatic action to occur from the conditions in the question is a Group 3 NSSSS Isolation at 140ºF at the outlet of the NRHX. This isolation signal will close the HV-44-2F004 PCIV. From the table a 2ºF/min heatup of the outlet temperature exists. Since there is a 20ºF difference from 120ºF to 140 at that heatup rate the isolation signal will occur at T= 10.0 minutes. So it will have happened by T=10 |
| **DISTRACTOR (B)** | **HV-044-2F004 Isolates, T = 5 min;** Wrong. Plausible to the candidate that mistakenly calculates the isolation based on high temp alarm at 130°F rather than the actual 140°F. There is no isolation on the high temp alarm condition. |
| **DISTRACTOR (C)** | **HV-044-2F001 Isolates, T = 10 min;** Wrong. Plausible misconception that the high outlet temperature causes an inboard PCIV isolation (HV-44-2F001). As noted above, 2F004 outlet valve actually closes, not 2F001. |
| **DISTRACTOR (D)** | **HV-044-2F001 Isolates, T = 5 min;** Wrong. Plausible misconception that the high outlet temperature causes an inboard PCIV isolation (HV-44-2F001) valve rather than the outlet (HV-44-2F004) valve and mistakenly calculates the isolation based on high temp alarm at 130°F rather than the actual 140°F isolation |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164096 |
| User-Defined ID: | Q #07 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Interpret Component Temps due to loss of CCW |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | This is a Tier 1 KA because the loss of RECW cooling initiates the ultimate loss of RWCU system requiring assessment of the integrated plant response, and the information required to answer this question is procedure based.ON-113 |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295018 AA2.01 |
| **KA Statement** | Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Component temperatures. |
| **Cognitive level** | HIGH |
| **Safety Function** | 8 Plant Service Systems |
| **10 CFR 55** | 41.10 / 43.5 / 45.13 |
| **Technical Reference with Revision No:** | ARC-MCR-112 H-1 Rev 0<br>ON-113<br>Rev.028 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS044.10a |

**8** **ID: 2201938** **Points: 1.00**

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

- 108 Reactor D5, SCRAM Valve Pilot Air Header Lo Press

WHICH ONE of the following identifies the ON Procedure(s) that require entry, if any?

A. No ON Procedure entry required

B. ONLY Enter ON-107, Control Rod Drive System Problems

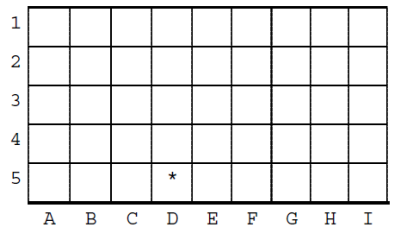
C. ONLY Enter ON-119, Loss of Instrument Air

D. Enter ON-107, Control Rod Drive System Problems, and Enter ON-119, Loss of Instrument Air

Answer: D

**Answer Explanation**

LIMERICK GENERATING STATION
108 REACTOR D-5
1BC803 20




ALARM WORDING:

SCRAM VALVE
PILOT AIR
HEADER
LO PRESS

AUTOMATIC ACTIONS:

1. None

OPERATOR ACTIONS:

1. Verify pressure using 47-1N652 on 10C613
2. Enter ON-107 Low CRD Scram Air Header Pressure.
3. Enter ON-119 Loss of Instrument Air.

This is one of the rare annunciators that required entry into two separate ONs. Based on the above ARC excerpt, entry into both ON-107 and ON-119 is correct.

From ON-107

**ON-107** CONTROL ROD DRIVE SYSTEM PROBLEMS

1.0 **SYMPTOMS**

1.1 *A/*B CRD WATER PUMP TRIP alarm
**OR** *A/*B CRD WATER PUMP MOTOR OVERCURRENT alarm.

1.2 *A/*B CRD PUMP SUCTION LO PRESS alarm
**OR** CRD PUMP SUCTION FILTER HI dP alarm.

1.3 CRD CHARGING WATER LOW PRESS alarm.
**OR** CRD DRIVE WATER FILTER HI dP alarm.

1.4 SCRAM VALVE PILOT AIR HEADER LO PRESS alarm.

From ON-119

**ON-119** LOSS OF INSTRUMENT AIR

1.0 **SYMPTOMS**

1.1 Both Instrument Air Header low pressure alarms.

1.2 Scram pilot air header low pressure alarm.

| | |
|---|---|
| **ANSWER (D)** | **Enter ON-107, Control Rod Drive System Problems, and Enter ON-119, Loss of Instrument Air:** Correct, as described above. |
| **DISTRACTOR (A)** | **No ON Procedure entry required:** Wrong, plausible to the examinee who believes that entry would not be based solely on the annunciator (this is the case for T-103 entry conditions that need to be validated from the field) |
| **DISTRACTOR (B)** | **ONLY Enter ON-107, Control Rod Drive System Problems:** Wrong, plausible to the examinee who does not recall that this annunciator is also an entry condition for ON-119 |
| **DISTRACTOR (C)** | **ONLY Enter ON-119, Loss of Instrument Air:** Wrong, plausible to the examinee who does not recall that this annunciator is also an entry condition for ON-107 |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 8 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 |
| | |
| System ID: | 2201938 |
| User-Defined ID: | Q #08 BANK |
| Cross Reference Number: | LGSOPS1550.01 |
| | |
| Topic: | Loss of Instrument Air Entry ON-107 and ON-119 |
| Num Field 1: | LM |
| Num Field 2: | RO Low |
| Text Field: | ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | This question requires the operator to interpret MCR meters for Instrument air pressure and determine that based on those pressures and subsequent alarms, actions must be taken per the Off Normal procedures to scram the reactor. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295019 G2.4.4 4.5 |
| **KA Statement** | **Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.** |
| **Cognitive level** | Low |
| **Safety Function** | 8 - Plant Service Systems |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | ON-119 Rev.034<br>ON-119 Bases Rev.034<br>ON-107 Rev.021<br>ARC-MCR-108 D5 Rev000 |
| **Question History: (i.e. LGS NRC-05)** | LGS NRC #08 (2018) |
| **Question Type: (New, Bank, Modified)** | Bank (2078938) |
| **Revision History:** | |
| **Training Objective** | LGSOPS1550.02 |

**9** **ID: 2200016** **Points: 1.00**

Unit 2 has just entered OPCON 4 in preparation for a refueling outage.

An inadvertent isolation and subsequent mechanical failure closed of HV-051-2F008, "RHR Shutdown Clg Suction Outboard PCIV", results in a loss of Shutdown Cooling with 2B RHR and necessitates establishing Alternate Shutdown Cooling using SRV's and Suppression Pool Cooling, per:

- ON-121 Attachment 6, "Alternate Shutdown Cooling", and
- S41.7.B, Use of SRV's and Suppression Pool Cooling as an Alternate Shutdown Cooling Method".

Conditions have been established as follows:

- Suppression Pool Cooling is in service using the '2A' RHR pump
- The '2E' and '2H' SRV control switches are in the OPEN position
- Suppression Pool pressure is 0 psig and steady
- Condensate transfer has been isolated to 2A, 2B, and 2D RHR.

Given:

- HV-051-2F017D - 2D LPCI Injection Valve
- HV-051-2F015B - 2B RHR Shutdown Clg Injection PCIV

Which one of the following describes the action required to establish alternate shutdown cooling through an open SRV?

Open __ (1) __ and raise RPV injection until RPV __(2)__.

| | 1 | 2 |
|---|---|---|
| A. | HV-051-2F015B | pressure is 55 psig |
| B. | HV-051-2F015B | is flooded to the Main Steam Lines |
| C. | HV-051-2F017D | pressure is 55 psig |
| D. | HV-051-2F017D | is flooded to the Main Steam Lines |

Answer: C

**Answer Explanation**

| | |
|---|---|
| **ANSWER (C)** | **(1) HV-051-2F017D**<br>**(2) pressure is 55 psig, Correct**.<br>A 50 psig D/P is required across the SRV's in order for them to open a establish alternate heat removal. 2D LPCI is the injection source. 17D is the flow path for LPCI. |
| **DISTRACTOR (A)** | **(1) HV-051-2F015B**<br>**(2) pressure is 55 psig, Wrong.**<br><br>Plausible to the candidate that misinterprets the available flow path and assumes injection is raised through the 15B which is the normal shutdown cooling injection pathway. |
| **DISTRACTOR (B)** | **(1) HV-051-2F015B**<br>**(2) is flooded to the Main Steam Lines, Wrong:**<br><br>Plausible to the candidate that misinterprets the available flow path and assumes injection is raised through the 15B which is the normal shutdown cooling injection pathway.<br><br>Also, Plausible misconception that RPV flooded to the MSLs is sufficient head to open the SRVs based on the wording in T-116 which is to raise water level to "Flood the RPV to the MSLs" (Step RF-31) and provide a flow path to the S.P. The T-116 actions are based on flooding the vessel without level indication and ensuring that fuel is covered. Raising level to just top of the steam lines will not provide a flowpath through an open SRV |
| **DISTRACTOR (D)** | **(1) HV-051-2F017D**<br>**(2) is flooded to the Main Steam Lines; Wrong:**<br><br>Plausible misconception that RPV flooded to the MSLs is sufficient head to open the SRVs based on the wording in T-116 which is to raise water level to "Flood the RPV to the MSLs" (Step RF-31) and provide a flow path to the S.P. The T-116 actions are based on flooding the vessel without level indication and ensuring that fuel is covered. Raising level to just top of the steam lines will not provide a flowpath through an open SRV |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| Question 9 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 |
| | |
| System ID: | 2200016 |
| User-Defined ID: | Q #09 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Operate/Monitor ADHR due to loss of SDC |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295021 AA1.04 3.7/3.7 |
| **KA Statement** | Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING: Alternate heat removal methods. |
| **Cognitive level** | HIGH |
| **Safety Function** | 4 - Heat Removal From Rx Core |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | ON-121 Attachment 6 Rev 33 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0051.5<br>LGSOPS3000.2 |

**10** **ID: 2200017** **Points: 1.00**

Unit 2 is shutdown with fuel shuffle 2 in progress on the Refuel Floor.

The Unit 2 Refuel Bridge main hoist is loaded with a new fuel bundle in the Unit 2 spent fuel pool.

- The bundle is to be inserted into Core Quadrant B.
- '2B' SRM reads 10 CPS
- ST-6-107-632-2, "One Rod Out Interlock Verification Testing" was just completed SAT.

The following MCR annunciator alarms with the bridge maneuvering in the Spent Fuel Pool:

- 208 REACTOR F4, ROD DRIFT

The '2B' SRM now reads 30 CPS.

WHICH ONE of the following states the effect on the refuel bridge and the required procedure to enter?

| | Refuel Bridge Effect | Procedure |
|---|---|---|
| A. | The refuel bridge will be prevented from being moved anywhere over the core. | ON-104, "Control Rod Problems" |
| B. | The refuel bridge will be prevented from being moved anywhere over the core. | ON-120, "Fuel Handing Problems" |
| C. | The refuel bridge will experience a bridge fault and ALL refuel bridge motion will be halted. | ON-104, "Control Rod Problems" |
| D. | The refuel bridge will experience a bridge fault and ALL refuel bridge motion will be halted. | ON-120, "Fuel Handing Problems" |

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **The refuel bridge will be prevented from being moved anywhere over the core.**<br>**ON-104, "Control Rod Problems". Correct.**<br>The question describes a fuel-loaded refuel platform, currently in the fuel pool, to be moved to the second core quadrant, while a Rod Drift alarm annunciates. The annunciator shows that a control rod is no longer at position 00 and moving without a command signal. When the bridge is moved toward the core area, the refuel interlock will auto stop the bridge before the core area is reached. This is to prevent a large reactivity addition to the core (largest reactivity addition would be in the cell with the control rod is drifting). The undemanded movement of the control rod is an entry condition to the ON-104. |
| **DISTRACTOR (B)** | **The refuel bridge will be prevented from being moved anywhere over the core.**<br>**ON-120, "Fuel Handing Problems". Wrong.**<br>ON-120 is plausible as it requires that count rates incur two doublings. The stem of the question only provides an increase in SRM count rates from 10 to 30 CPM, rather than the required 10 to 40 CPM to achieve two doublings. This is attractive to the candidate that sees a doubling from 10 to 20 CPM and then another 10 CPM increase as meeting the 2 doubling entry condition. |
| **DISTRACTOR (C)** | **The refuel bridge will experience a bridge fault and ALL refuel bridge motion will be halted, ON-104, "Control Rod Problems". Wrong.**<br>Plausible to the candidate who believes that the SAT performance ST-6-107-632-2 test verifies the ability of the refuel bridge to move over the core with a control rod withdrawn. This test tests the ability to withdraw only one control rod with the Reactor Mode Switch in the SHUTDOWN position. |
| **DISTRACTOR (D)** | **The refuel bridge will experience a bridge fault and ALL refuel bridge motion will be halted, ON-120, "Fuel Handing Problems"; Wrong:**<br>Plausible to the candidate who believes that the SAT performance ST-6-107-632-2 test verifies the ability of the refuel bridge to move over the core with a control rod withdrawn. This test tests the ability to withdraw only one control rod with the Reactor Mode Switch in the SHUTDOWN position. ON-120 is plausible as it requires that count rates incur two doublings. The stem of the question only provides an increase in SRM count rates from 10 to 30 CPM, rather than the required 10 to 40 CPM to achieve two doublings. This is attractive to the candidate the sees a doubling from 10 to 20 CPM and then another 10 CPM increase as meeting the 2 doubling entry condition. |

| **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: | 0.00 |
| | |
| System ID: | 2200017 |
| User-Defined ID: | Q #10 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Reasons for fuel handling interlocks as applied to Refuel Accidents |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295023 AK3.02 3.4 |
| **KA Statement** | Refueling Accidents Knowledge of the reasons for the following responses as they apply to REFUELING ACCIDENTS: Interlocks associated with fuel handling equipment. |
| **Cognitive level** | HIGH |
| **Safety Function** | 8 |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | S97.0.M Rev 43<br>ON-104 Rev 59<br>ON-120 Rev 30<br>ST-6-107-632-2 Rev 23 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0097.3, 5, 11 |

**11** **ID: 2164996** **Points: 1.00**

A seismic event has resulted in the following Unit 2 plant conditions:

- T-102 entered
- RCIC is maintaining level
- Suppression pool temperature is 155°F up slow
- LOCA with drywell pressure greater than Primary Suppression Pressure (PSP)
- Drywell sprays have been initiated and Drywell pressure is rapidly dropping

Drywell sprays must be secured before _____(1)_____ and the basis for that action ____(2)___?

| | (1) | (2) |
|---|---|---|
| A. | -0.5 PSIG | Prevent exceeding the negative pressure rating of the drywell |
| B. | -0.5 PSIG | Prevent cavitation of RCIC due to operation below the NPSH limit |
| C. | 0 PSIG | Prevent exceeding the negative pressure rating of the drywell |
| D. | 0 PSIG | Prevent cavitation of RCIC due to operation below the NPSH limit |

Answer: C

**Answer Explanation**

| | |
|---|---|
| **ANSWER (C)** | **0 PSIG, Prevent exceeding the negative pressure rating of the drywell; Correct:** From T-102, step PCC-8 directs terminating DW spray before pressure drops below 0 psig. From the basis for T-102, terminating spray by 0 psig will prevent exceeding the negative pressure rating of the drywell. |
| **DISTRACTOR (A)** | **-0.5 PSIG, Prevent exceeding the negative pressure rating of the drywell; Wrong:** Plausible to the candidate that recalls the actual design negative pressure value of -0.5 psig but fails to account for the T-102 direction to secure at 0.0 psig to avoid exceeding the limit. |
| **DISTRACTOR (B)** | **-0.5 PSIG, Prevent cavitation of RCIC due to operation below the NPSH limit Wrong:** Plausible to the candidate that recalls the actual design negative pressure value of -0.5 psig but fails to account for the T-102 direction to secure at 0.0 psig to avoid exceeding the limit and who recalls the NPSH limits of RCIC and the effect that lowering containment pressure would have on RCIC. In this case, there is still significant margin for NPSH even at 0 psig . |
| **DISTRACTOR (D)** | **0 PSIG, Prevent cavitation of RCIC due to operation below the NPSH limit Wrong:** Plausible to the candidate who recalls the NPSH limits of RCIC and the effect that lowering containment pressure would have on RCIC. In this case, there is still significant margin for NPSH even at 0 psig. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164996 |
| User-Defined ID: | Q #11 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Implications on DW integrity due to High DW Press |
| 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 to determine the impact of High Drywell pressure on DW integrity as the initiating condition of this question is a high drywell pressure from a LOCA. Drywell integrity is challenged based on the EOP actions to spray the drywell. If sprays are not secured prior to pressure becoming negative, the negative drywell pressure limit will be exceeded. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295024 EK1.01 4.1 |
| **KA Statement** | Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: Drywell integrity: Plant-Specific. |
| **Cognitive level** | High |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.8 to 41.10 |
| **Technical Reference with Revision No:** | T-102 Rev. 028<br>T-102 Bases Rev 028 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0060.4 |

**12** **ID: 2200018** **Points: 1.00**

Unit 1 was operating at full power when a transient resulted in a reactor scram following a Group 1 NSSSS Isolation.

- HPCI automatically started and injected.
- The HPCI flow controller thumbwheel was adjusted to 3000 GPM to maintain RPV level steady.
- Fifteen (15) minutes later RPV pressure rose from 900 psig to 1100 psig.

WHICH ONE of the following describes:
(1) HPCI speed over the course of the RPV pressure increase?
(2) The lowest RPV pressure above which entry into T-101, “RPV Control,” is required?

| | (1) | (2) |
|---|---|---|
| A. | Remained STABLE | 1053 psig |
| B. | Remained STABLE | 1096 psig |
| C. | Rising | 1053 psig |
| D. | Rising | 1096 psig |

Answer: D

**Answer Explanation**

HPCI discharge pressure is higher than reactor pressure to provide a large enough differential pressure to provide flow into the RPV. As the differential pressure between the pump discharge and the RPV lowers, flow rate will lower. The flow controller will sense the lowering flow and change the signal sent to the governor control valve raising turbine speed until the flow rises to match the flow controller setting.

T-101, "RPV Control", has an entry condition of RPV pressure "greater than 1096 psig". This is the scram setpoint as well. The RPV high pressure alarm is generated at 1053 psig and is only an entry into OT-102, "RPV High Pressure" AOP.

| | |
|---|---|
| **ANSWER (D)** | **Rising, 1096 psig. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **Remained stable, 1053 psig. Wrong.**<br>The stem indicates that flow was reduced using the controller to 3000 gpm using the controller thumbwheel. This will change only the controller flow setpoint. The candidate could take this manipulation of the controller as placing it "manual". With the controller in "manual", the speed of the of the HPCI turbine is maintained and not flow. Therefore over the course of the pressure rise, HPCI turbine speed would remain constant. The 1053 psig is plausible as it is the RPV High Pressure Alarm setpoint as well as the pressure to which the operators lower pressure below as an immediate operator action in OT-102, "RPV High Pressure" AOP |
| **DISTRACTOR (B)** | **Remained Stable, 1096 psig. Wrong.**<br>The stem indicates that flow was reduced using the controller to 3000 gpm using the controller thumbwheel. This will change only the controller flow setpoint. The candidate could take this manipulation of the controller as placing it "manual". With the controller in "manual", the speed of the of the HPCI turbine is maintained and not flow. Therefore over the course of the pressure rise, HPCI turbine speed would remain constant. |
| **DISTRACTOR (C)** | **Rising, 1053 psig. Wrong.**<br>The 1053 psig is plausible as it is the RPV High Pressure Alarm setpoint as well as the pressure to which the operators lower pressure below as an immediate operator action in OT-102, "RPV High Pressure" AOP |

| 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 |
| | |
| System ID: | 2200018 |
| User-Defined ID: | Q #12 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of reason for HPCI Ops due to Hi RPV Pressure |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295025 EK3.03 3.8 |
| **KA Statement** | High Reactor Pressure Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: HPCI operation: Plant-Specific. |
| **Cognitive level** | HIGH |
| **Safety Function** | 3 - Reactor Pressure Control |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | LGSOPS0055 Rev 2 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0055.12 |

**13** **ID: 2164369** **Points: 1.00**

Unit 1 plant conditions:

- 98% power
- Suppression Pool level is 22.5'
- Suppression Pool temperature (SPOTMOS) is 87°F.
- HPCI is operating in Full Flow test mode for a quarterly surveillance
- HPCI pump suction temperature is 92°F, rising at .5°F/ min
- 1A RHR pump is operating in Suppression pool cooling with a pump suction temperature of 87°F
- Pool Temperature is rising at 2°F / min

WHICH ONE of the following identifies the **preferred** Suppression Pool temperature indication per T-102, and the time (in minutes) until the HPCI test must be secured due to the limits of T.S.3.6.2.1 (assume constant heat up rate)?

| | Preferred Temperature | Minutes |
|---|---|---|
| A. | SPOTMOS | 4 min. |
| B. | SPOTMOS | 9 min. |
| C. | 1A RHR Pump Suction Temperature | 4 min. |
| D. | 1A RHR Pump Suction Temperature | 9 min |

Answer: B

**Answer Explanation**

Refer to T-102, SP/T-1, which reminds operators that the SPOTMOS probes are located in the suppression pool at an elevation which corresponds to an indicated suppression pool level of 17.8 ft. If indicated suppression pool level drops below 17.8 ft., Residual Heat Removal (RHR) pump suction temperature can be used as a valid alternate method for determining suppression pool temperature provided an RHR pump is running.

| | |
|---|---|
| **ANSWER (B)** | **SPOTMOS, 9 min; Correct**: Correct for the reasons described above, with level above 17.8', SPTMOS should be used for temperature indication. Per tech spec 3.6.2.1.a.2.a, Max temperature in the Suppression pool is 105°F during testing which adds heat to the chamber. |
| **DISTRACTOR (A)** | **SPOTMOS, 4 min; Wrong:** Plausible to the examinee who recognizes that the supp pool level is high enough to use SPOTMOS, but who mistakenly believes that 95°F is the limit per T.S. 3.6.2.1.a.2. but fails to recall the exception for testing contained in part a. of the spec. |
| **DISTRACTOR (C)** | **1A RHR Pump Suction Temperature,4 min; Wrong:** Plausible to the examinee who does not recognizes that the supp pool level is above the low level where SPOTMOS is invalid and therefore believes that running RHR pump suction temperature should be used and who mistakenly believes that 95°F is the limit per T.S. 3.6.2.1.a.2. but fails to recall the exception for testing contained in part a. of the spec.. |
| **DISTRACTOR (D)** | **1A RHR Pump Suction Temperature, 9 min; Wrong:** Plausible to the examinee who does not recognizes that the supp pool level is above the low level where SPOTMOS is invalid and therefore believes that running RHR pump suction temperature should be used |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 13 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 |
| | |
| System ID: | 2164369 |
| User-Defined ID: | Q #13 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to operate/monitor Temperature Monitoring as applied to SP Hi Water Temp. |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

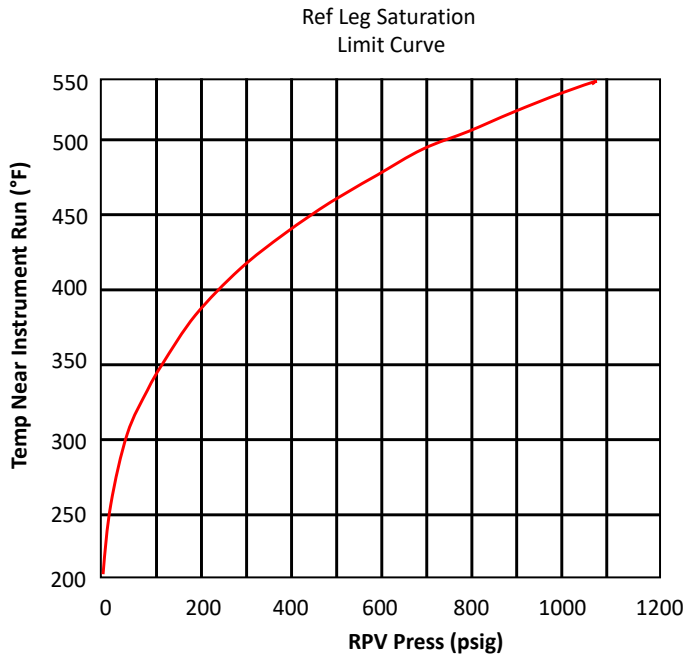
| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295026 EA1.03 3.9 |
| **KA Statement** | Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Temperature monitoring. |
| **Cognitive level** | High |
| **Safety Function** | 5 |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | T-102 Rev 28 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.2c, 5 |

**14** **ID: 2200019** **Points: 1.00**

Unit 1 is operating at 100% power when it experiences a Loss of Coolant Accident (LOCA) .

Drywell temperature is 360°F
Reactor Pressure is 100 psig
Wide range level indication on PAMS is -50 inches steady




In accordance with T-102, "Primary Containment Control", complete the following statement below:

Level Instrument XR-42-1R623B ____(1)_____ and all level instrument indications should be verified using ____(2)_____.

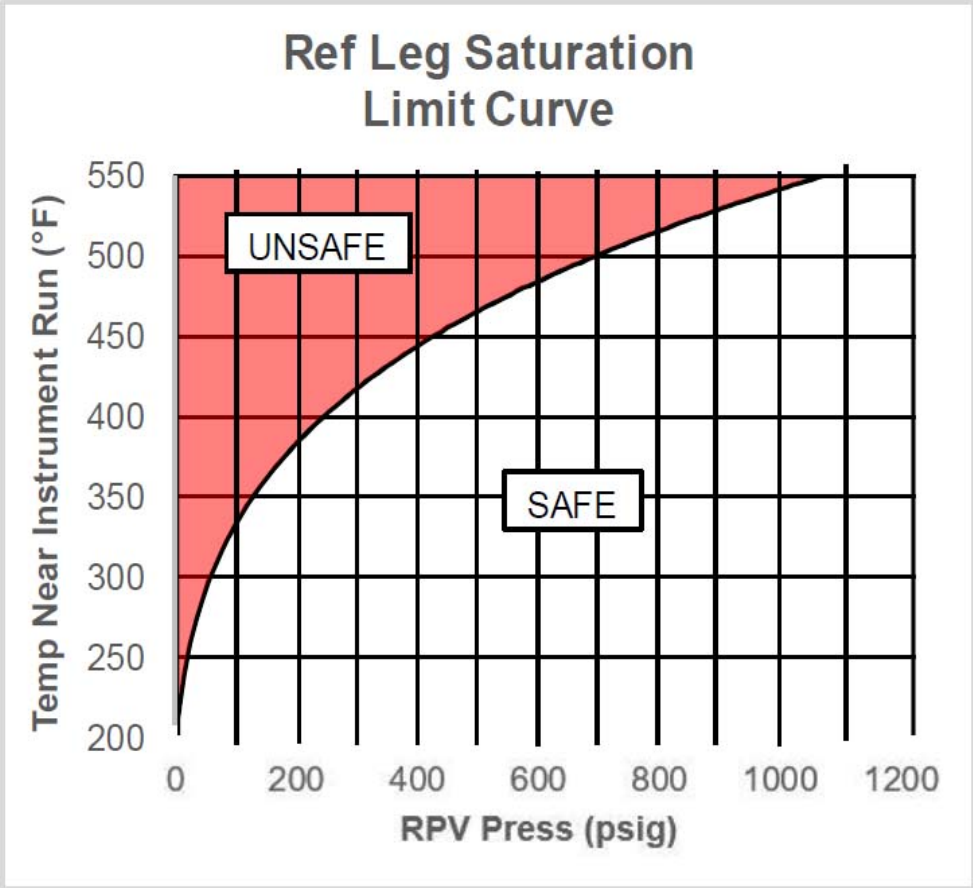
| | 1 | 2 |
|---|---|---|
| A. | may be unreliable | T-291, Temp Effects on Rx Level Inst. |
| B. | may be unreliable | OP-AID 00-009 Temperature Compensation Graph |
| C. | safe to use | T-291, Temp Effects on Rx Level Inst. |
| D. | safe to use | OP-AID 00-009 Temperature Compensation Graph |

Answer: A

| **Answer Explanation** |
|---|
| Following a Loss of Coolant Accident in primary containment a DW pressure and temperature |

will be elevated and RPV Pressure and Temperature will drop. These two effects will allow conditions for RPV level instrument reference leg flashing to occur. When reference leg flashing occurs indicated RPV level will rise on the affected level instruments due to a reduction of the static column of water to the level transmitter.

The CRD system is normally aligned to provide constant backfill to the RPV level instrument reference legs to prevent flashing. During a LOCA the CRD pumps are load shed and must be manually restarted.



| | |
|---|---|
| **ANSWER (A)** | **May be unreliable, T-291, Temp effects on Rx Level Inst.; Correct:** With the conditions provided, Plotted point is on the unsafe side of the curve. and per the bases for T-102, when in this region, operators must be aware of possible effects on level instruments. The caution in T-102 also directs the operator to T-291 to verify the RPV level and or trend can be relied upon |
| **DISTRACTOR (B)** | **May be unreliable, OP-AID 00-009 Temperature Compensation Graph; Wrong:** Plausible to the candidate that plots the point on the curve and recognizes it is on the unsafe side and recalls that the OP-Aid provides temperature correction for indicated vs. actual level. This is valid during normal operation primarily startup and shutdown but not during accident conditions. |
| **DISTRACTOR (C)** | **Safe to use,T-291, Temp effects on Rx Level Inst.; Wrong:** Plausible to the candidate that does not correctly plot the point but recalling the note in T-102, correctly determines that T-291 should be consulted to validate the reading. |
| **DISTRACTOR (D)** | **Safe to use, OP-AID 00-009 Temperature Compensation Graph; Wrong.** Plausible to the candidate that does not correctly plot the point on the curve and determines that T-291 is not required but that Temperature Compensation would be a good idea. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200019 |
| User-Defined ID: | Q #14 NEW |
| Cross Reference Number: | OPEN - EMBEDDED |
| | |
| Topic: | Interrelation between Hi DWT and Rx Water Level Indication |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | Embedded graph of DW Temp vs. Press. The *SAFE* and *UNSAFE* regions of the *"Reference Leg Saturation Limit Curve"* are unmarked and associated coloring has been removed. |
| **K/A Justification** | None |
| **SRO-Only Justification** | N/A |
| **Additional Information** | None |

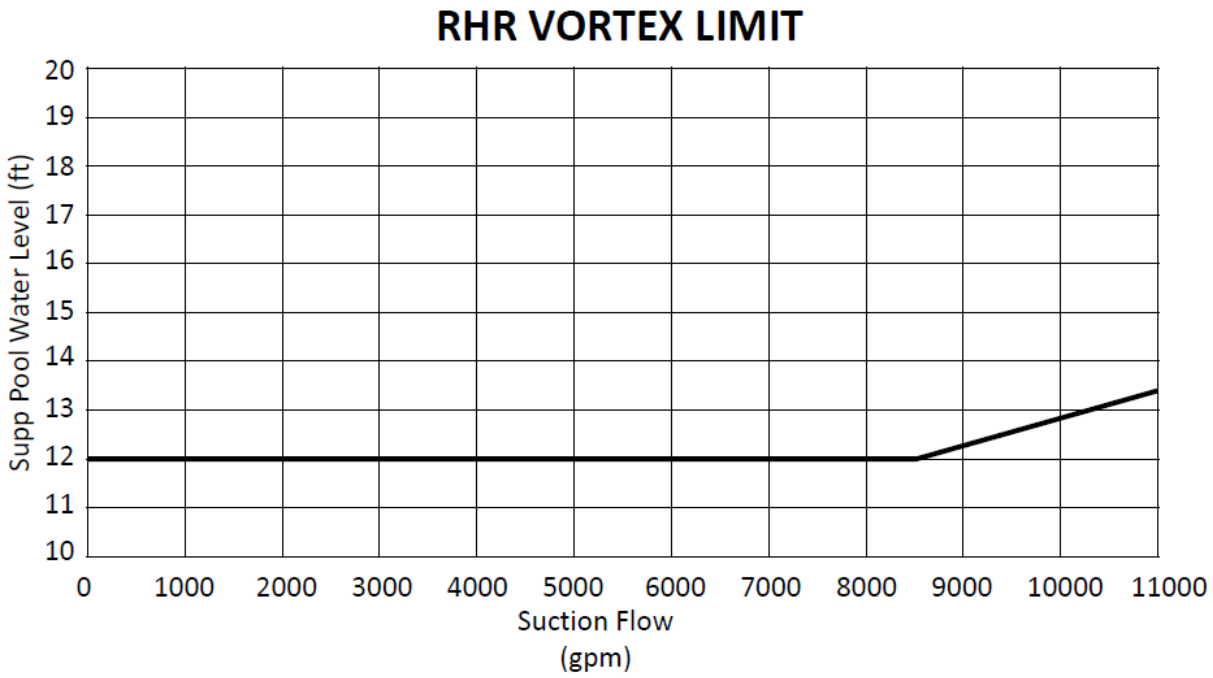
| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295028 EK2.03 3.6 |
| **KA Statement** | Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Reactor water level indication. |
| **Cognitive level** | HIGH |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.7 / 45.8 |
| **Technical Reference with Revision No:** | T-102 Bases Rev. 028<br>T-102 Rev. 028 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0042.2b, 7 |

**15** **ID: 2200020** **Points: 1.00**

Unit 1 Suppression Pool Level is 12.5 feet on LI-52-140A & B

The '1C' RHR pump is operating in LPCI mode maintaining level.

The reactor is depressurized to 20 psig.




WHAT IS the MAXIMUM FLOW that is recommended through the pump and the BASIS for that limit?

| | Maximum Flow | Basis |
|---|---|---|
| A. | 9000 gpm | Pump Runout |
| B. | 9000 gpm | Pump Air Entrainment |
| C. | 11000 gpm | Pump Runout |
| D. | 11000 gpm | Pump Air Entrainment |

Answer: B

**Answer Explanation**

The graph is a recreation of a graph found on T-102 Sheet 2. The only difference is the removal of the coloring to indicates the side of the bolded line unsafe for operation.
The SAFE side of the line is above it.

T-102 Basis Rev 27 (SP/T page 16)
Vortex limits are defined to be the lowest suppression pool level above which air entrainment is not expected to occur in pumps that take a suction on the suppression pool. These suppression pool levels are functions of Emergency Core Cooling System (ECCS) flow. Exceeding the limits can lead to air entrainment at the pump suction strainers.

| | |
|---|---|
| **ANSWER (B)** | **9000 gpm, Pump Air Entrainment, Correct.** Given a Suppression Pool level of 12.5 feet a value of 9000 gpm can be determined to be on the safe side of the graph. If on the safe side of the graph then the pump is running within its vortex limits, which prevents air entrainment. |
| **DISTRACTOR (A)** | **9000 gpm, RHR Pump Runout, Wrong.** Plausible to the candidate that does not recall the correct basis for the graph but recalls that high flow with low discharge pressure is a condition of runout |
| **DISTRACTOR (C)** | **11000 gpm, RHR Pump Runout, Wrong.** Plausible to the candidate that does not understand which side of the line on the graph is the safe side for pump operation and recalls that high flow with low discharge pressure is a condition of runout. |
| **DISTRACTOR (D)** | **11000 gpm, Pump Air Entrainment, Wrong.** Plausible to the candidate that does not understand which side of the line on the graph is the safe side for pump operation or how to use the graph. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200020 |
| User-Defined ID: | Q #15 NEW |
| Cross Reference Number: | OPEN - EMBEDDED |
| | |
| Topic: | Ability to operate/monitor ECCS Systems as applied to Low SPL |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | OPEN - EMBEDDED. T-102 Sheet 2 RHR Vortex Limit Curve. The *SAFE* and *UNSAFE* regions of the "*RHR Vortex Limit Curve"* are unmarked and associated coloring has been removed. |
| **K/A Justification** | None |
| **SRO-Only Justification** | N/A |
| **Additional Information** | None |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295030 EA1.01 3.6 |
| **KA Statement** | Ability to operate and/or monitor the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: ECCS systems (NPSH considerations): Plant-Specific. |
| **Cognitive level** | HIGH |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | T-102 Sh 2, T-102 Bases Rev 28 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.3 |

**16** **ID: 2200021** **Points: 1.00**

T-111, "Alternate Level/Pressure Control" is in progress with the following:

- Reactor water level is -207"
- RPV pressure is 300 psig and steady.
- No injection systems are available to the RPV

WHICH ONE of the following correctly completes the following two statements:

For the above conditions Adequate Core Cooling _____(1)_____ present.

(2) With no injection into the RPV, what is the highest peak clad temperature that ensures adequate core cooling?

| | (1) | (2) |
|---|---|---|
| A. | is | 1800ºF |
| B. | is | 2200ºF |
| C. | is NOT | 1800ºF |
| D. | is NOT | 2200ºF |

Answer: A

**Answer Explanation**

T-101, "RPV Control"
**Minimum Steam Cooling RPV Water Level (MSCRWL, -186")**
The MSCRWL (-186") is the lowest RPV level at which the covered portion of the reactor core will generate sufficient steam to prevent any clad temperature in the uncovered part of the core from exceeding 1500°F assuming the most limiting top-peaked power shape prior to reactor shutdown.

Adequate core cooling is ensured **following emergency RPV depressurization** as long as one of two conditions exists:

- • RPV level can be restored and maintained above -186", the Minimum Steam Cooling RPV Water Level (MSCRWL). The core is then cooled by a combination of submergence and steam cooling even with no core spray flow, or
- • Design core spray loop flow requirements, produced by two Core Spray pumps in the same loop, are satisfied (6,250 gpm) and, RPV level can be restored and maintained at or above the elevation of the jet pump suctions (-211").

T-111 Alternate Level/Pressure Control
**Minimum Zero-Injection RPV Water Level (MZIRWL, -236")**
The steam generated by the covered portion of the core is exactly sufficient to remove the heat generated in the uncovered region with PCT at 1800□F.

The ECCS design criteria of peak cladding temperature below 2200 degrees F

| | |
|---|---|
| **ANSWER (A)** | **is, 1800ºF. Correct:**<br>As described above, with no injection and greater than -236 inches of RPV water level, adequate core cooling exists with a peak cladding temperature of 1800ºF |
| **DISTRACTOR (B)** | **is, 2200ºF. Wrong:**<br>Plausible if the candidate mistakenly believes that the ECCS design criteria of peak cladding temperature below 2200 degrees F constitutes adequate core cooling. |
| **DISTRACTOR (C)** | **is NOT, 1800ºF. Wrong:**<br>Plausible to the candidate that recognizes that RPV water level is below MSCRWL (-186 inches) and as such concludes that adequate core cooling is not present and does not recognize the conditions for MZIRWL adequate core cooling are met. |
| **DISTRACTOR (D)** | **is NOT, 2200ºF. Wrong:**<br>Plausible to the candidate that recognizes that RPV water level is below MSCRWL (-186 inches) and as such concludes that adequate core cooling is not present and does not recognize the conditions for MZIRWL adequate core cooling are met. and plausible if the candidate mistakenly believes that the ECCS design criteria of peak cladding temperature below 2200 degrees F constitutes adequate core cooling. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200021 |
| User-Defined ID: | Q #16 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to determine/interpret adequate core cooling as it applies to Rx Low Level |
| Num Field 1: | LM |
| Num Field 2: | RO-Low |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | The questions requires knowing differences between when adequate core cooling is and is not assured. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | The answer conditions are derived from the bases of EOPs from which the mitigation strategy for providing ACC to the reactor are defined. This make the question RO level |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295031 EA2.04 4.6 |
| **KA Statement** | **Reactor Low Water Level:** Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Adequate core cooling. |
| **Cognitive level** | Low |
| **Safety Function** | 2 - Reactor Water Inventory Control |
| **10 CFR 55** | 41.10 / 43.5 / 45.13 |
| **Technical Reference with Revision No:** | T-101 Rev 28, T-101 Bases Rev 28, T-111 Rev 18, T-111 Bases Rev 18. |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.5 |

**17** **ID: 2200022** **Points: 1.00**

Unit 1 is operating at 100%

A Main Turbine trip occurs with a failure to scram of 150 control rods.

- All Full Core Display blue lights are lit
- Pressure peaked at 1145 psig

- The RO did not initiate RRCS

- 10 minutes later, level is being controlled with feedwater between -60 inches and -100 inches
- Rx power is 12%

(1) What automatic RRCS functions should have activated at this time and
(2) What procedure must be directed to manually insert the remaining control rods?

Given: T-215 - De-energization of Scram Solenoids
T-217 - RPS/ARI Reset and Backup method of Draining Scram Discharge Volume

| | 1. | 2. |
|---|---|---|
| A. | RPT and SLC ONLY | T-215 |
| B. | RPT and SLC ONLY | T-217 |
| C. | ARI, RPT, SLC | T-215 |
| D. | ARI, RPT, SLC | T-217 |

Answer: D

**Answer Explanation**

The automatic initiation of Alternate Rod Insertion system will occur under the following conditions:
-38" RPV Water Level OR 1149 psig RPV Pressure OR Manual RRCS Pushbuttons

| | |
|---|---|
| **ANSWER (D)** | **ARI, RPT, SLC, T-217; Correct.**<br>See initiation logic above for ARI initiation. RPT and SLC will occur on -38" Rx level with a 9 second delay for RPT and 118 sec delay for SLC without operator action. ARI will initiate immediately on -38". Per T-117, LQ/Q-10, For a hydraulic ATWS (Blue Scram Lights Lit) Insert rods using T-217. |
| **DISTRACTOR (A)** | **RPT and SLC Only, T-215; Wrong.**<br>Plausible to the candidate that knows that SLC and RPT initiate on -38" Rx level but assumes that ARI must be initiated either by high press (1149 psig) or manually by the RO. ARI will automatically initiate on low low level(-38") immediately (no time delay)<br>T-215 is plausible to candidate that with the given conditions misdiagnoses the ATWS as an electrical ATWS, requiring the de-energization of RPS. |
| **DISTRACTOR (B)** | **RPT and SLC Only, T-217; Wrong:**<br>Plausible to the candidate that knows that SLC and RPT initiate on -38" Rx level but assumes that ARI must be initiated either by high press (1149 psig) or manually by the RO. ARI will automatically initiate on low low level(-38") immediately (no time delay). Per T-117, LQ/Q-10, For a hydraulic ATWS (Blue Scram Lights Lit) Insert rods using T-217. |
| **DISTRACTOR (C)** | **ARI, RPT, SLC, T-215; Wrong:**<br>T-215 is plausible to candidate that with the given conditions misdiagnoses the ATWS as an electrical ATWS, requiring the de-energization of RPS. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200022 |
| User-Defined ID: | Q #17 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the interrelations b/n Scram Condition Present > APRM dnscl and RRCS |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295037 EK2.02 4.0 |
| **KA Statement** | **SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown:** Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: RRCS: Plant-Specific. |
| **Cognitive level** | High |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | L-S-55 Redundant Reactivity Control System. T-117 Rev.023 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0036A.LO3 |

**18** **ID: 2164755** **Points: 1.00**

Unit 1 Plant Conditions:

- Reactor Power 100%
- HVAC Zones 1 and 3 are tied together and operating normally.

A fuel failure occurs:

- The Shift Emergency Director declared an Unusual Event due to Offsite Release Rates
- Reactor Enclosure HVAC Exhaust Radiation Reading
    - o RRSH-26-1R605 Ch A = 1.33 mr/hr
    - o RRSH-26-1R614 Ch B = 1.34 mr/hr
    - o RRSH-26-1R605 Ch C = 1.35 mr/hr
    - o RRSH-26-1R614 Ch D = 1.36 mr/hr

(1) What TRIP procedure(s) should be entered?

(2) What is the current Unit 1 release point?

| | (1) | (2) |
|---|---|---|
| A. | T-103 and T-104 | Unit 1 South Stack |
| B. | T-103 and T-104 | North Stack |
| C. | T-103 Only | Unit 1 South Stack |
| D. | T-103 Only | North Stack |

Answer: D

**Answer Explanation**

T-103 Entry conditions of concern:

- Reactor Enclosure HVAC Exhaust isolation signal 1.35 mr/hr

T-104 Entry Condition

- Offsite release above ALERT level per EP-AA-1008, Addendum 3

The logic for the RE Isolation is Channels A & B OR Channels C & D. Since Channels C & D are above the 1.35mr/hr isolation setpoint a valid Isolation of the Unit 1 RE and RF will occur.

Normal alignment of RE and RF HVAC exhaust is through the Unit South Stack. When the RE and RF HVAC systems are tied together an isolation signal on either system will cause an isolation on both systems. Once an RE or RF HVAC Isolation occurs the exhaust point is re-aligned through the Common North Stack via the Standby Gas Treatment System.

| | |
|---|---|
| **ANSWER (D)** | **T-103 Only, North Stack. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **T-103 and T-104, South Stack. Wrong.**<br>Plausible to the candidate that recalls the entry condition to T-104 as an Unusual Event based on offsite release rates. This is plausible to the candidate who does not recall the radiation setpoint or logic combination required to initiate a RE HVAC isolation and thus RE HVAC continues to exhaust through the Unit 1 South Stack. |
| **DISTRACTOR (B)** | **T-103 and T-104, North Stack. Wrong.** Plausible to the candidate that recalls the entry condition to T-104 as an Unusual Event based on offsite release rates. |
| **DISTRACTOR (C)** | **T-103 Only, South Stack. Wrong.** Plausible to the candidate who recognizes the entry value of 1.35mr/hr for T-103 but does not believe the system logic is sufficient to cause an isolation. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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: | 0.00 |
| | |
| System ID: | 2164755 |
| User-Defined ID: | Q #18 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to operate/monitor Plant Ventilation as apply to Hi Offsite Release Rate |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295038 EA1.06 3.5 |
| **KA Statement** | **High Off-Site Release Rate:** Ability to operate and/or monitor the following as they apply to HIGH OFFSITE RELEASE RATE: Plant ventilation. |
| **Cognitive level** | HIGH |
| **Safety Function** | 9 - Radioactivity Release |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | T-103 Rev 25, T-104 Rev 13,<br>EP-AA-1008 Addendum 3 Rev 5,<br>GP-8.1 Rev 17 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0076.LO3, LGSOPS1560.2 |

**19** **ID: 2164805** **Points: 1.00**

WHICH ONE of the following REQUIRES an Emergency Plant Shutdown as an IMMEDIATE OPERATOR ACTION?

A. Fire in the Cable Spreading Room and heavy smoke in the MCR

B. Toxic Gas in the MCR

C. Notification of Air Based Threat within 25 minutes of plant

D. Fire in the Remote Shutdown Panel Room

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **Fire in the Cable Spreading Room and heavy smoke in the MCR. Correct.** SE-1 directs scramming both reactors as an immediate operator action. |
| **DISTRACTOR (B)** | **Toxic Gas in the MCR. Wrong.** SE-2 directs donning SCBAs within 2 minutes for toxic gas or chlorine events in the MCR as immediate operator actions. Only later in the procedure, as part of the follow up actions does it state that if the MCR becomes uninhabitable enter SE-1. |
| **DISTRACTOR (C)** | **Notification of Air Based Threat with 25 minutes of plant. Wrong.** There is no immediate operator action to shut down the reactor in SE-23. There are follow up actions to scram the reactor for a validated airborne threat less than 5 minutes of the plant. |
| **DISTRACTOR (D)** | **Fire in the Remote Shutdown Panel Room. Wrong.** Neither SE-8 or ARC-MCR-006 J3L have any direction to scram the reactor as an immediate operator action. SE-8 only discusses plant shutdown as a follow up action based on location of the fire. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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: | 0.00 |
| | |
| System ID: | 2164805 |
| User-Defined ID: | Q #19 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to determine need for plant S/D due to fire on Site |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 600000 AA2.13 3.2 |
| **KA Statement** | Plant Fire On Site<br>Ability to determine and/or interpret the following as they apply to PLANT FIRE ON SITE: Need for emergency plant shutdown. |
| **Cognitive level** | LOW |
| **Safety Function** | 8 - Plant Systems |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | SE-1 Rev 76, SE-2 Rev 29, SE-8 Rev 60, SE-23 Rev 28 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS2000.2 |

**20** **ID: 2170736** **Points: 1.00**

Plant conditions are as follows:

- PJM has declared a Grid Emergency due to a Hurricane Warning and an anticipated loss of Grid Load.
- E-5, "Grid Emergency" has been entered

Current conditions on Unit 2 Main Generator:

- Unit 2 AVR is in Automatic
- Generator MW load is 1100 MW
- Generator MVAR load is 200 MVAR lagging
- Grid voltage is rising

WHICH ONE of the following describes:
(1) What is the response of the Main Generator MVARS as grid voltage rises?
(2) What operator action is required to restore Main Generator reactive load to 200 MVAR lagging?

| | (1) | (2) |
|---|---|---|
| A. | Increases | Raise generator field excitation. |
| B. | Increases | Lower generator field excitation. |
| C. | Decreases | Raise generator field excitation. |
| D. | Decreases | Lower generator field excitation. |

Answer: C

**Answer Explanation**

As real load is shed on the grid, Grid Voltage will rise. The Main Generator AVR (Automatic Voltage Regulator) will attempt to maintain terminal voltage on the generator at a constant value by lowering generator field excitation, resulting in a lowering Main Generator field current value. This has the effect of underexciting the Main Generator field in relation to what it was at the start of the transient and causes VARS (reactive load) to drop as well. This underexcitation trend will continue until Grid Voltage stabilizes, the AVR adjustment limiter is reached, or operator action is taken.

To reverse the lowering lagging reactive load trend by manual action, an operator raises the Main Generator terminal voltage setpoint on the AVR. This will cause the Main Generator field excitation to increase, and Main Generator terminal voltage to rise and the VARS to recover..

| | |
|---|---|
| **ANSWER (C)** | **Decreases, Raise generator field excitation. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **Increases, Raise generator field excitation. Wrong.**<br>Plausible misconception that assumes a rising grid voltage acts in a similar way to manually raising the AVR terminal voltage setpoint and understands to raise reactive load in the lagging direction, generator field excitation must be increased. |
| **DISTRACTOR (B)** | **Increases, Lower generator field excitation. Wrong.**<br>Plausible misconception that rising grid voltage acts in a similar way to manually raising the AVR terminal voltage setpoint. With this same thought process, lowering the generator field should also cause an increase in reactive load in the lagging direction. |
| **DISTRACTOR (D)** | **Decreases, Lower generator field excitation. Wrong.**<br>Plausible to the candidate that confuses lagging and leading reactive load behavior with a change in generator field excitation. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2170736 |
| User-Defined ID: | Q #20 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Determine Actions based on Main Gen Parameters During Grid Emergency |
| 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** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 700000 AK1.03 3.3 |
| **KA Statement** | **Generator Voltage and Electric Grid Disturbances:** Knowledge of the operational implications of the following concepts as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Under-excitation. |
| **Cognitive level** | HIGH |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.4, 41.5, 41.7, 41.10 / 45.8 |
| **Technical Reference with Revision No:** | E-5, S32.3.A |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0032.LO4 |

**21** **ID: 2200023** **Points: 1.00**

A Unit 1 reactor startup is in progress with the following conditions:

- Reactor power is 28% and stable
- Main Turbine First Stage pressure is 175 psig and steady
- Main Generator is synched to the Grid

A loss of sealing steam causes vacuum to decay

- Annunciator 104-COND-E5, 1A CONDENSER LO VACUUM 104-E5, is in ALARM
- Off Gas system flow has risen to 175 scfm and steady
- Condenser vacuum (PR-05-101) is 23.5 inches Hg vacuum and degrading at a rate of 1/2 inch Hg per minute
- RPV pressure is 955 psig and stable

If the current rate of vacuum degradation continues, per OT-116, "Loss of Condenser Vacuum", what is the required action?

A. Start the Mechanical Vacuum Pump

B. Scram the reactor

C. Trip the main turbine

D. Perform a GP-4, Rapid Plant Shutdown, immediately

Answer: C

**Answer Explanation**

The following actuations occur as a result of lowering Main Condenser Vacuum:

- *A(B,C) CONDENSER LO VACUUM (*04-E(F,G)-5) alarm 23.5" Hg Vac
- Main Turbine Trip 21.5" Hg Vac
- *A(B,C) RFPT LOW VACUUM (*02-A(B,C)-4) alarm 18.5" Hg Vac
- *A(B,C) RFPT LOW VACUUM TRIP (*02-A(B,C)-3) alarm 15" Hg Vac
- MSIV Isolation 8.54" Hg Vac
- Bypass Valve Closure 7" Hg Vac

| | |
|---|---|
| **ANSWER (C)** | **Trip the main turbine; Correct:** Based on the conditions in the stem of the question (23.5 in/Hg -21.5 in/Hg) X 2 min/inch = 4 minutes to reach the Turbine Trip setpoint. Step 3.2 in OT-116 is to trip the turbine at 22". Since power is 28%, it is within the limit of the BPV and 1st stage pressure so no scram will occur. . |
| **DISTRACTOR (A)** | **Start the Mechanical Vacuum Pump; Wrong.** This is plausible to the candidate that recalls that OT-116 recommends using the MVP to assist in maintaining vacuum if the Air Ejectors/Offgas are unable to do so. However, there is a caution in the procedure that the MVP cannot be used above 5% signal as there is potential for explosion due to the presence of H2 and O2 in the condenser. |
| **DISTRACTOR (B)** | **Scram the reactor; Wrong:** This is plausible to the candidate that calculates time to 21.5" as above. (23.5 in/Hg -21.5 in/Hg) X 2 min/inch = 4 minutes to reach the turbine trip setpoint. And IOA step 2.1 states that "IF main turbine trip will cause reactor scram, AND turbine trip is imminent (condenser vacuum 22” Hg Vac and lowering) THEN manually SCRAM the reactor. However, because power is 28%, a turbine trip will not cause a scram and therefore a scram is not required at this time. |
| **DISTRACTOR (D)** | **Perform a GP-4, Rapid Plant Shutdown, immediately; Wrong:** Plausible to the candidate who recalls the procedure step to perform a GP-4 shutdown if offgas flow is too high. However, in this scenario, off gas flow is stated at 175 scfm but the procedure direction is for GP-4 if 200 scfm is exceeded. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200023 |
| User-Defined ID: | Q #21 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to determine/interpret Rx Power as applied to Loss of Condenser Vacuum |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295002 AA2.02 3.2 |
| **KA Statement** | **Loss of Main Condenser Vacuum:** Ability to determine and/or interpret the following as they apply to LOSS OF MAIN CONDENSER VACUUM: Reactor power: Plant-Specific. |
| **Cognitive level** | HIGH |
| **Safety Function** | 3 - Reactor Pressure Control |
| **10 CFR 55** | 41.10 / 43.5 / 45.13 |
| **Technical Reference with Revision No:** | OT-116 Rev 46 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS3000 |

**22** **ID: 2167522** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor power 100%
- Reactor level 35"

An electrical transient causes the B and D channel FWLC narrow range level transmitters to simultaneously fail downscale

Annunciator 107 D-4 "FWLCS FAILURE" is received with the following DFWLCS workstation alarm:

- "1XXX-FW300.ILE" - Reactor Level Error

Given: OT-100 - Reactor Low Level
OT-110 - Reactor High Level

WHICH ONE of the following describes the Control Mode of all three Reactor Feed Pumps and the applicable procedure that should be entered?

| | Control Status | Procedure to Enter |
|---|---|---|
| A. | Auto | OT-100 |
| B. | Auto | OT-110 |
| C. | Manual | OT-100 |
| D. | Manual | OT-110 |

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **Manual, OT-110; Correct:** S06.1.H Alarm procedure describes the results of 2 simultaneous level transmitter failures as: FWLCS Failure which causes Recirc pumps to run back to Low speed - 28%. Also, the RFP flow controllers will swap to manual (M/A). Based on that, Feed pumps are in manual at the 100% speed and RRP runback to 28% will cause a feed flow/steam flow mismatch and a rise in reactor level. This is the entry condition for **OT-110**. The immediate operator action for FWLCS Failure is to manually control RFPs if a RFP controller malfunction exists. |
| **DISTRACTOR (A)** | **Auto, OT-100; Wrong:** Plausible to the candidate who recalls that 2 level transmitters can fail without losing the ability to automatically control level. However, a simultaneous failure will cause a Feedwater failure, a swap to Manual of the controllers and RRP runback. Also plausible to the candidate who interprets the failure of the level inputs to cause a reduction in feed flow to restore level to the normal band. This associated level reduction would be an entry into OT-100. |
| **DISTRACTOR (B)** | **Auto, OT-110; Wrong:** Plausible to the candidate who recalls that 2 level transmitters can fail without losing the ability to automatically control level. However, a simultaneous failure will cause a Feedwater failure, a swap to Manual of the controllers and RRP runback. |
| **DISTRACTOR (C)** | **Manual, OT-100; Wrong:** Plausible to the candidate who interprets the failure of the level inputs to cause a reduction in feed flow to restore level to the normal band. This associated level reduction would be an entry into OT-100. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167522 |
| User-Defined ID: | Q #22 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Operational Implications of Stm Flow/Feed Flow Mismatch on Hi RPV Level |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295008 AK1.03 3.2 |
| **KA Statement** | High Reactor Water Level Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR WATER LEVEL: Feed flow/steam flow mismatch. |
| **Cognitive level** | HIGH |
| **Safety Function** | 2 - Reactor Water Inventory Control |
| **10 CFR 55** | 41.8 to 41.10 |
| **Technical Reference with Revision No:** | OT-110<br>Rev.034<br>ARC-MCR-107, D4<br>Rev.003 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0006.13 |

**23** **ID: 2200024** **Points: 1.00**

Unit 1 plant conditions:

- RPV Level is -70".
- Reactor Power is 30%.
- Full Core Display blue lights are **LIT** for all 185 control rods.
- 1A and 1B CRD pumps are tripped and cannot be restarted.

WHICH ONE of the following procedures would be effective for the given conditions?

A. T-213 - Individual Control Rod Scram/Solenoid De-energization

B. T-214 - Manual Initiation of ARI

C. T-218 - Control Rod Insertion By Withdraw Line Venting

D. T-219 - Maximizing CRD Cooling Water Header Flow During ATWS Conditions

Answer: C

**Answer Explanation**

Based on plant conditions (ATWS, all scram valves opened), it can be surmised that the scram air header has depressurized and that some type of hydraulic lock/mechanical interference exists which is not permitting the CRD Hydraulic system to properly control rods to insert. This being the case, some method of raising the differential pressure across the CRDM drive piston and/or removing water from the Scram Discharge Volume would be most effective in establishing the conditions necessary to insert the control rods.

| | |
|---|---|
| **ANSWER (C)** | **T-218. Correct:** T-218, Control Rod Insertion By Withdraw Line Venting, directs actions to vent the individual CRD withdrawal header to a floor drain to develop d/p across the CRD piston and cause rod insertion. |
| **DISTRACTOR (A)** | **T-213. Wrong:** Plausible misconception that blue lights on the full core display mean that the scram solenoids are energized. T-213, Individual Control Rod Scram/Solenoid De-energization, directs actions to individually scram control rods at the HCUs by using the test switches to de-energize its scram air pilot valves. |
| **DISTRACTOR (B)** | **T-214. Wrong:** Plausible misconception that ARI initiation would be effective inserting control rods.<br>T-214, Manual Initiation Of ARI, directs actions to initiate ARI from the Auxiliary Equipment Room to vent the scram air header. Because plant conditions indicate that the scram air header is already depressurized, this method is not likely to be successful. |
| **DISTRACTOR (D)** | **T-219. Wrong:** Plausible misconception that T-219, Maximizing CRD Cooling Water Header Flow During ATWS Conditions, would be effective to cause rod insertion. T-219 directs actions to maximize CRD cooling water header flow during ATWS conditions to cause control rods to drift in, however as noted in the stem, CRD pumps are tripped and cannot be restarted. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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: | 0.00 |
| System ID: | 2200024 |
| User-Defined ID: | Q #23 NEW |
| Cross Reference Number: | CLOSED |
| Topic: | Ability to operate/monitor CRD Hydraulics as applied to Incomplete Scram |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295015 AA1.01 3.8 |
| **KA Statement** | **Incomplete SCRAM:** Ability to operate and/or monitor the following as they apply to INCOMPLETE SCRAM: CRD hydraulics. |
| **Cognitive level** | HIGH |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | T-101 Rev 23,<br>T-213 Rev 13, T-214 Rev 15,<br>T-218 Rev 9 , T-219 Rev 4 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS2003.3, 6 |

**24** **ID: 2165127** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor Power is 100%
- Outside air temperature is 95° F
- "1B" Drywell Chiller is in service
- "1A" and "1B" Drywell Chilled Water Pumps are in service

A Dead Bus Transfer of the D12 Bus results in a loss of Drywell Chilled Water with the following indications:

- Drywell temperature is 143 ° F and up slow
- Drywell pressure rises to 0.7 psig

WHICH ONE of the following identifies the required action(s) to restore a DWCW flow path to the containment, if any?

A. No action required, flow path is maintained

B. Reopen the DWCW Containment isolation valves

C. Reset isolation R2 with Blue/Green reset per GP 8.3 and reopen the DWCW Containment isolation valves

D. Bypass the isolation per GP 8.5 and reopen the DWCW Containment isolation valves

Answer: B

**Answer Explanation**

From E-D12

**NOTE**

Loss of 10-Y102 (D124-R-G-23) will de-energize interposing relays
**AND** isolate Drywell Chilled Water (DWCW) Loop A
**AND** B isolation valves. The valves are powered from D124-R-C and will not isolate until power is restored to MCC. [ ]

| | |
|---|---|
| **ANSWER (B)** | **Reopen the DWCW Containment isolation valves. Correct.** The Dead Bus transfer of D12 will de-energize the interposing relays, resulting in isolation/closure of the DWCW Containment Isolation Valves upon re-energization of the bus. The valves can be re-opened when D12 power is restored because no isolation signal is present. |
| **DISTRACTOR (A)** | **No action required, flow path is maintained. Wrong.** Plausible if the applicant fails to recognize that DW cooling isolation valves will close upon restoration of power to the MOVs due to the effects of the interposing relays. |
| **DISTRACTOR (C)** | **Reset isolation R2 with Blue/Green reset per GP 8.3 and reopen the DWCW Containment isolation valves. Wrong.** Plausible if the applicant believes an isolation signal exists. Performing an R2 with Blue/Green reset would clear an existing isolation signal when the monitored parameter (i.e., High DW Pressure for DWCW Containment Isolation Valves) has returned to a normal value. With no isolation signal present, the DWCW Containment Isolation Valves can be re-opened once power is restored to the D12 bus. |
| **DISTRACTOR (D)** | **Bypass the isolation per GP 8.5 and reopen the DWCW Containment isolation valves. Wrong.** Bypassing the isolation per GP-8.5 is plausible if the applicant believes that an isolation signal exists. With no isolation signal present, the DWCW Containment Isolation Valves can be re-opened once power is restored to the D12 bus. In addition, GP-8.5 is not directed until DW temperature rises above 145°F in accordance with T-102, Step DW/T-5. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2165127 |
| User-Defined ID: | Q #24 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Operate/monitor DW cooling as applied to Inadvertent Containment Isolation |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295020 AA1.02 3.2 |
| **KA Statement** | **Inadvertent Containment Isolation:** Inadvertent Containment Isolation: Ability to operate and/or monitor the following as they apply to INADVERTENT CONTAINMENT ISOLATION: Drywell ventilation/cooling system. |
| **Cognitive level** | High |
| **Safety Function** | 5 - Containment Integrity<br>7 - Instrumentation |
| **10 CFR 55** | 41.7 / 45.6 |
| **Technical Reference with Revision No:** | E-D12 Rev 15 |
| **Question History: (i.e. LGS NRC-05)** | NRC LGS2012, NRC LGS2017 |
| **Question Type: (New, Bank, Modified)** | BANK (1097448,1799276) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0072.O5m |

**25** **ID: 2200026** **Points: 1.00**

Unit 2 Reactor pressure is 890 psig.

No CRD pumps are running.

Which of the following describes the MAXIMUM time and the MINIMUM conditions requiring the Mode Switch to be placed in SHUTDOWN per ON-107, "Control Rod Drive System Problems"?

A. Immediately if ONE inoperable accumulator is associated with a fully withdrawn control rod.

B. Immediately if more than ONE inoperable accumulator is associated with fully withdrawn control rods

C. Within 20 minutes if ONE inoperable accumulator is associated with a fully withdrawn control rod

D. Within 20 minutes if more than ONE inoperable accumulator is associated with fully withdrawn control rods

Answer: B

**Answer Explanation**

With more than one control rod scram accumulator inoperable, the rod is required to be declared inoperable. Additionally, charging header pressure must be verified ≥1400 psig, and restart one control drive pump **and**
1) If reactor pressure is >= 900 psig, then restart at least one control drive pump within 20 minutes or place the reactor mode switch in the shutdown position,
**or**
2) If reactor pressure is <900 psig, then place the reactor mode switch in the Shutdown position.

| | |
|---|---|
| **ANSWER (B)** | **Immediately if more than ONE Inoperable accumulator is associated with fully withdrawn control rods; Correct.** Given that reactor pressure is <900 psig an no CRD pump are running, an immediate Scram is required if there are more than one inoperable accumulator. |
| **DISTRACTOR (A)** | **Immediately if ONE Inoperable accumulator is associated with a fully withdrawn control rod; Wrong.** Plausible to the candidate who confuses the action required for multiple INOP accumulators. The immediate time frame is correct. |
| **DISTRACTOR (C)** | **Within 20 minutes if ONE Inoperable accumulator is associated with a fully withdrawn control rod; Wrong.** Plausible for the candidate who recalls the action for multiple INOP accumulators with RPV pressure greater than 900 psig but applies it to the case of only a single inoperable accumulator. |
| **DISTRACTOR (D)** | **Within 20 minutes if more than ONE Inoperable accumulators are associated with fully withdrawn control rods; Wrong.** Plausible for the candidate who recalls the action for multiple INOP accumulators with RPV pressure greater than 900 psig. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200026 |
| User-Defined ID: | Q #25 MODIFIED |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of interrelations b/n Loss of CRD Pumps and Rx Pressure (Scram Assist). |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | Knowledge of when to scram is considered part of RO license level at LGS. The required action is a <1hr TS action. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295022 AK2.07 3.4 |
| **KA Statement** | Loss of Control Rod Drive Pumps: Knowledge of the interrelations between LOSS OF CRD PUMPS and the following: Reactor Pressure (SCRAM assist): Plant-Specific. |
| **Cognitive level** | LOW |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.7 / 45.8 |
| **Technical Reference with Revision No:** | TS 3.1.3.5 Amend. 143<br>ON-107 Rev.021 |
| **Question History: (i.e. LGS NRC-05)** | LGS NRC 2012 |
| **Question Type: (New, Bank, Modified)** | MODIFIED (1098622) |
| **Revision History:** | |
| **Training Objective** | LGSOPS1550.03 |

**26** **ID: 2165297** **Points: 1.00**

Unit 1 is operating at 100%:

- At 0300 the following Annunciator is received:
  004 VENT A2, A REAC ENCL HVAC PNL 1AC208 TROUBLE

- At 0305 the following Annunciator is received:
  107 REACTOR F5, DIV 1 STEAM LEAK DET SYS HI TEMP/TROUBLE

No other information is currently available.

At what time should T-103, Secondary Containment Control be entered, and when T-103 is entered, what RPV Level instrument is available?

| | Time T-103 Entered | Level Instrument Available |
|---|---|---|
| A. | 0300 | Wide Range Level (Lv(WR) LI-042-1R604) |
| B. | 0300 | 1B PAMS (Lv/Px XR-042-1R623B) |
| C. | 0305 | Wide Range Level (Lv(WR) LI-042-1R604) |
| D. | 0305 | 1B PAMS (Lv/Px XR-042-1R623B) |

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **0305, 1B PAMS (Lv/Px XR-042-1R623B). Correct.** A Reactor Enclosure area temperature above its MNO value will result in the receipt of a Division I, II, III, or IV steam leak detection annunciator. Anytime a steam leak detection annunciator is received, T-103 should be entered. The steam leak detection alarm is received at 0305. T-103 immediately directs the use of Post Accident Monitor (PAMS), Fuel Zone and EQ PPC parameters only when Steam Leak Detection Annunciators are in alarm. The PAMs Recorders are XR-042-1R623A and XR-042-1R623B. |
| **DISTRACTOR (A)** | **0300, Wide Range Level (Lv(WR) LI-042-1R604). Wrong.** Receipt of a REACTOR ENCLOSURE HVAC PANEL TROUBLE annunciator is an entry condition to T-103 only if it has been determined that the alarm is due to a high unit cooler inlet temperature (which corresponds to the MNO value in TABLE SCC-1), the respective ARC will direct entry into T-103. The REACTOR ENCLOSURE HVAC PANEL TROUBLE is received at 0300. Plausible to the candidate that does not recall that the REACTOR ENCLOSURE HVAC PANEL TROUBLE entry condition must be verified before entry. |
| **DISTRACTOR (B)** | **0300, 1B PAMS (Lv/Px XR-042-1R623B). Wrong.** Receipt of a REACTOR ENCLOSURE HVAC PANEL TROUBLE annunciator is an entry condition to T-103 only if it has been determined that the alarm is due to a high unit cooler inlet temperature (which corresponds to the MNO value in TABLE SCC-1), the respective ARC will direct entry into T-103. The REACTOR ENCLOSURE HVAC PANEL TROUBLE is received at 0300. Plausible to the candidate that does not recall that the REACTOR ENCLOSURE HVAC PANEL TROUBLE entry condition must be verified before entry. |
| **DISTRACTOR (C)** | **0305, Wide Range Level (Lv(WR) LI-042-1R604). Wrong.** The steam leak detection alarm is received at 0305. T-103 immediately directs the use of Post Accident Monitor (PAMS), Fuel Zone and EQ PPC parameters only when Steam Leak Detection Annunciators are in alarm. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2165297 |
| User-Defined ID: | Q #26 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of EOP entry conditions and immediate action steps. |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295032 Generic 2.4.1 4.6 |
| **KA Statement** | High Secondary Containment Area Temperature Knowledge of EOP entry conditions and immediate action steps. |
| **Cognitive level** | LOW |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.10 / 43.5 / 45.13 |
| **Technical Reference with Revision No:** | T-103 Rev 25 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.2D |

**27** **ID: 2165299** **Points: 1.00**

Consider the following types of devices installed in the Unit 1 RWCU Pump Room:

- Steam Flooding Damper
- Blowout Panel

WHICH ONE of the following identifies:

(1) the device that is designed to actuate at 0.5 psid?

(2) the specific purpose for which that device is designed?

| | (1) | (2) |
|---|---|---|
| A. | Blowout Panel | Prevent ventilation systems from rendering equipment in other rooms inoperable on high energy line break in RWCU Pump room |
| B. | Blowout Panel | Relieve over-pressure from within RWCU Pump room in the event a high-energy pipe break in that room |
| C. | Steam Flooding Dampers | Prevent ventilation systems from rendering equipment in other rooms inoperable on high energy line break in RWCU Pump room |
| D. | Steam Flooding Dampers | Relieve over-pressure from within RWCU Pump room in the event a high-energy pipe break in that room |

Answer: B

**Answer Explanation**

Generally, there are two types of components that are designed to mitigate an overpressure condition within a room/area: Blowout panels, and Steam Flooding Dampers (SFDs). Blowout panels are mounted only in the following rooms: Outboard MSIV Room, RWCU Pump Room, and HPCI and RCIC Pump Rooms, all of which are in Secondary Containment. Steam Flooding Dampers are located in many areas, all of which are also within Secondary Containment (refer to P&ID M-0076, Sheet 5, Table J, for a complete listing of the SFDs within the Unit 1 Reactor Enclosure).

Although both types of components do in fact "mitigate" an overpressure condition, only the blowout panels actually "relieve" pressure from within the room/area; i.e., the panels are installed as part of the room/area walls using differential-pressure sensitive explosive washers that act to disengage the panel from the wall upon sensing a fairly small d/p within that room/area. For example: the Unit 1 RWCU Pump Room has one blowout, mounted on the West wall of the Unit 1 Reactor Enclosure, which actuates at 0.5 psid to rapidly relieve pressure from within the RWCU Pump Room (due to a high-energy pipe break in the room) directly to the outside atmosphere. [Refer to Secondary Containment lesson plan, page 5-6 for a description of blowout panel operation, including actuation setpoints.]

Although Steam Flooding Dampers (SFDs) act to mitigate a room's high pressure condition, they do not "relieve" pressure from within that room. Rather, SFDs are installed in the HVAC supply and exhaust ducts for that room. They are normally-open and will automatically close when pressure inside the duct is 5" W.G. higher than pressure outside the duct (i.e., pressure within that room). By closing, the SFD simply prevents the high-energy pipe break problem in that room from propagating to adjacent Secondary Containment rooms/areas. [Refer to R.E. HVAC lesson plan, for a description of SFD operation and actuation setpoint.]

| | |
|---|---|
| **ANSWER (B)** | **(1) Blowout Panel; (2) Relieve over-pressure from within RWCU Pump room in the event a high-energy pipe break in that room. Correct.** Correct for the reasons described above. |
| **DISTRACTOR (A)** | **(1) Blowout Panel; (2) Prevent ventilation systems from rendering equipment in other rooms inoperable on high energy line break in RWCU Pump room. Wrong.** Part (2) is plausible to the examinee who fails to recognize that this is just another way to describe the function of a steam flooding damper; a blowout panel does not provide such a function. |
| **DISTRACTOR (C)** | **(1) Steam Flooding Dampers; (2) Prevent ventilation systems from rendering equipment in other rooms inoperable on high energy line break in RWCU Pump room. Wrong.** This choice would be correct if the stem were asking about a device that actuates at 5" W.G., rather than at 0.5 psid. Plausible to the examinee who confuses the two actuation setpoints. |
| **DISTRACTOR (D)** | **(1) Steam Flooding Dampers; (2) Relieve over-pressure from within RWCU Pump room in the event a high-energy. Wrong.** Plausible to the examinee who fails to recall the relative actuation setpoints for the two devices and also neglects to recognize that the SFD would isolate the room rather than allow it to propagate. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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: | 0.00 |
| | |
| System ID: | 2165299 |
| User-Defined ID: | Q #27 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Reasons for Blow out Panel Operation for Secondary Cont. Hi D/P |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295035 EK3.01 2.8 |
| **KA Statement** | Secondary Containment High Differential Pressure Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Blow-out panel operation: Plant-Specific. |
| **Cognitive level** | LOW |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | P&ID M-0076, Sheet 5, Rev.41<br>LGSOPS0076A, R.E. HVAC lesson plan<br>LGSOPS0076B, Secondary Containment lesson plan |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (1149995) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0076B.06F |

**28** **ID: 2166041** **Points: 1.00**

Unit 1 is in a startup with the following conditions:

- Reactor Pressure is 150 psig
- Reactor Power is 5%
- 1B RHR is blocked out of service with a Tag Out

Consider the following sequence of events:

- The 10 Bus experiences a loss of power

One minute later - the following two events occur simultaneously:

- Drywell Pressure rapidly rises to 2 psig
- The 20 Bus experiences a loss of power

WHICH ONE of the following identifies the order in which the LPCI Loops will begin injecting into the RPV?

A. 1A and 1C simultaneously followed by 1D

B. 1A and 1C and 1D simultaneously

C. 1C followed by 1A followed by 1D

D. 1C and 1D simultaneously followed by 1A

Answer: A

**Answer Explanation**

**LOCA LOAD Sequence**

| | |
|---|---|
| t = 0 | LOCA signal - Diesel starts |
| t = 0 | Load shed |
| t = 0 | C & D RHR pumps start |
| t = 3 | L.C. Transformer Breaker closes |
| t = 5 | A & B RHR pumps start |
| t = 10 | A & C Core Spray pumps start |
| t = 15 | B & D Core Spray pumps start |

## LOCA w/LOOP

t = 0 D/G Breaker closes
t = 0 All RHR pumps start
t = 3 Load Center Breakers close
t = 7 All Core Spray pumps start

From the stem, reactor pressure is below 455 psig (1/2 of the LOCA signal).

A loss of the 10 Bus will result in a loss of the 101 Bus. D11 and D13 Buses are aligned to the 101 Bus. Upon a loss of the 101 Bus, after 0.5 seconds the associated EDG will receive a start signal and the 201 breaker will close re-powering the D11 and D13 Buses after 1 second.

At this point all four divisional safeguard buses are aligned to the 201 Bus with D11 EDG and D13 EDG running.

The next simultaneous event is a loss of the 20 bus which will result in a loss of the 201 Bus. As a result the D11 and D13 Buses will re-power from their associated EDG following a 0.5 second time delay. At the same time as the 20 Bus loss, drywell pressure rapidly rises to 2 psig (above the 2nd half of the required LOCA signal of 1.68 psig). With this situation all LPCI pumps will start and inject as soon as power to the bus is available. For the D14 Bus, the associated EDG was not previously running resulting in a 10 second delay (the required time for the EDG to start and reach rated voltage and frequency) to power the D14 Bus.

The expected sequence of event is:
The 1A LPCI Loop starts at T=0.5 second
The 1C LPCI Loop starts at T=0.5 second
and the 1D LPCI Loop starting at T=~10 seconds.

| | |
|---|---|
| **ANSWER (A)** | **1A and 1C simultaneously followed by 1D; Correct:**<br>Correct for the above reasons. 1A and 1C RHR are powered from their EDGs and can immediately inject as described. 1D will not start until D14 starts and loads in approx. 10 seconds. |
| **DISTRACTOR (B)** | **1A and 1C and 1D simultaneously; Wrong:**<br>Plausible to the candidate the believes that all the requirements for a LOCA/LOOP signal are met and that all three RHR pumps will start at time 0.5 seconds. This would require the D14 EDG to already be running |
| **DISTRACTOR (C)** | **1C followed by 1A followed by 1D; Wrong:**<br>Plausible to the candidate that recognizes that the 1A and 1C RHR Pumps will have power sooner than the 1D pump but erroneously applies the LOCA loading sequence where the 1C pump starts before the 1A RHR Pump. 1C at T=0 and 1A at T=5 sec. |
| **DISTRACTOR (D)** | **1C and 1D simultaneously followed by 1A. Wrong.**<br>Plausible to the candidate that fails take into consideration the loss of the offsite power sources and just applies the LOCA loading sequence where RHR 1C and 1D start at T=0 sec and 1A start at T=5 sec. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 28 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 |
| | |
| System ID: | 2166041 |
| User-Defined ID: | Q #28 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Monitor automatic operations of the RHR/LPCI: INJECTION MODE including: EDG load sequencing. |
| 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** | 203000 A3.09 3.6 |
| **KA Statement** | RHR/LPCI: Injection Mode Ability to monitor automatic operations of the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) including: Emergency generator load sequencing. |
| **Cognitive level** | HIGH |
| **Safety Function** | 2 - Reactor Water Inventory Control<br>4 - Heat Removal Form Rx Core |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | LGSOPS0092A |
| **Question History: (i.e. LGS NRC-05)** | ILT NRC 2017 |
| **Question Type: (New, Bank, Modified)** | BANK (2029824) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0092A.LO5 |

**29** **ID: 2202395** **Points: 1.00**

After a 2-year run, Unit 1 was shut down 8 hours ago for a refueling outage.

Currently:

- Reactor pressure is 0 psig
- Reactor temperature is 185°F
- Reactor level is +35"

A power supply failure has caused a loss of Shutdown Cooling (SDC) and it cannot be restored .

WHICH ONE of the following describes the required Reactor water level to establish natural circulation and the basis for that action?

| | Water Level | Basis |
|---|---|---|
| A. | 62 inches on shutdown range | Establishes a longer "Time to Boil" while alternate shutdown cooling is established |
| B. | 62 inches on shutdown range | Ensure Rx vessel temperature and moderator temperature increase together |
| C. | 76 inches on upset range | Establishes a longer "Time to Boil" while alternate shutdown cooling is established |
| D. | 76 inches on upset range | Ensure Rx vessel temperature and moderator temperature increase together |

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **62 inches on shutdown range, Ensure Rx vessel temperature and moderator temperature increase together; Correct:** Natural circulation requires level to be above the bottom drains of the moisture separators and this couples inside the shroud with the outside shroud area. This level is at >60 inches on Shutdown range or >78" on Upset range. By establishing natural circulation, rising temperatures inside the shroud are coupled to the outside area and transmitted into the vessel causing temperature to rise. This ensures that an accurate temperature is maintained. |
| **DISTRACTOR (A)** | **62 inches on shutdown range, Establishes a longer "Time to Boil" while alternate shutdown cooling is established:** Time to boil is plausible to the candidate who recalls that the more water inventory in the vessel, the longer it will take to heat up to "boiling". This is not the reason for this action. |
| **DISTRACTOR (C)** | **76 inches on upset range, Establishes a longer "Time to Boil" while alternate shutdown cooling is established; Wrong:** 76 inches is plausible to the candidate who recalls that level on Upset range must be greater than Shutdown range but does not recall the exact value. Time to boil is plausible to the candidate who recalls that the more water inventory in the vessel, the longer it will take to heat up to "boiling". This is not the reason for this action. |
| **DISTRACTOR (D)** | **76 inches on upset range, Ensure Rx vessel temperature and moderator temperature increase together; Wrong:** 76 inches is plausible to the candidate who recalls that level on Upset range must be greater than Shutdown range but does not recall the exact value. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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: | 3.00 |
| | |
| System ID: | 2202395 |
| User-Defined ID: | Q #29 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Predict RPV pressure response to loss of SDC |
| Num Field 1: | LM |
| Num Field 2: | RO Low |
| 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** | 205000 K3.03 3.8 |
| **KA Statement** | Shutdown Cooling Knowledge of the effect that a loss or malfunction of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) will have on following: Reactor temperatures (moderator, vessel, flange). |
| **Cognitive level** | Low |
| **Safety Function** | 4 - Heat Removal From Rx Core |
| **10 CFR 55** | 41.7 / 45.4 |
| **Technical Reference with Revision No:** | GP-6.1 Rev 044 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0072.LO2A, C |

**30** **ID: 2166210** **Points: 1.00**

Unit 2 plant conditions:

- Group 1 NSSSS Isolation occurred
- HPCI is running in full flow test (CST to CST) at 5000 gpm in automatic maintaining Reactor pressure
- RCIC is running at 400 GPM in automatic maintaining Reactor water level

A loss of Division 2 DC power occurs.

Which of the following identifies the plant impact, if any?

A. Reactor pressure remains constant

B. Reactor pressure rises

C. RCIC trips on overspeed

D. HPCI outboard steam isolation valve closes

Answer: B

**Answer Explanation**

A loss of DIV 2 power to HPCI will cause HPCI speed to run back to the low setting (600 RPM) due to loss of control power to the speed controller which feeds the Turbine Governor. DIV 2 provides power for control power, isolation circuits, all DIV 2 valves, initiation logic, aux oil pump control and turbine trip logic. HPCI is out of service and not available on loss of DIV 2 DC

| | |
|---|---|
| **ANSWER (B)** | **Reactor pressure rises; Correct:** A loss of DIV 2 power to HPCI will cause HPCI speed to run back to the low setting due to loss of control power to the flow controller which feeds the Turbine Governor. When turbine speed drops below approximately 1000 RPM the shaft driven oil pump will not have sufficient pressure to maintain the governor valve open. a loss of div II dc will cause the aux. oil pump to lose power, so it will not be available to start on low pressure. without the aux oil pump the governor will continue to close to the full closed position. HPCI will no longer control pressure and pressure will rise. |
| **DISTRACTOR (A)** | **Reactor pressure remains constant; Wrong:** Plausible to candidate who does not remember loss of div 2 will close governor but recalls that the isolation is energized to operate and therefore believes that nothing happens to HPCI. With the loss as described above, HPCI shuts down. |
| **DISTRACTOR (C)** | **RCIC trips on overspeed; Wrong:** Plausible to candidate who believes that RCIC operates using Division 2 DC power and recalls that on a loss of DC power, RCIC will overspeed as its governor moves to max position. RCIC uses Div 1 DC. No impact. |
| **DISTRACTOR (D)** | **HPCI outboard steam isolation valve closes; Wrong:** Plausible to candidate who recalls that the HPCI steam admission valve closes on a loss of Div 2 DC and conflates that with a steam isolation valve closing. In actuality, the AC powered steam isolation valves will not close. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 30 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 |
| | |
| System ID: | 2166210 |
| User-Defined ID: | Q #30 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | HPCI and Loss of DC Power |
| 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** | 206000 K1.07 3.7 |
| **KA Statement** | High-Pressure Coolant Injection<br>Knowledge of the physical connections and/or cause-effect relationships between HIGH PRESSURE COOLANT INJECTION SYSTEM and the following: D.C. power: BWR-2,3,4. |
| **Cognitive level** | High |
| **Safety Function** | 2 - Reactor Water Inventory<br>4 - Heat Removal From Reactor Core |
| **10 CFR 55** | 41.2 to 41.9 / 45.7 to 45.8 |
| **Technical Reference with Revision No:** | E41-1040-E-004, sht. 001 Rev 26<br>E41-1040-E-005, sht. 001 Rev 30<br>E41-1040-E-006, sht. 001 Rev 36<br>ARC-MCR-117, A1 Rev 2 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS.14a |

**31** **ID: 2200027** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor SCRAMMED on a loss of feed
- HPCI initiated on Low RPV Level and Tripped on High RPV Level.
- HPCI HIGH LEVEL Trip white light is lit
- HPCI Initiation White Light is Lit

- RPV level is now -5" and slowly lowering

Drywell pressure rises to 2.0 psig

WHICH ONE of the following describes the expected HPCI response?

The HPCI trip solenoid will _____

A. Energize and allow control oil to flow to the governor valve, and HPCI will start.

B. De-energize and allow control oil to flow to the governor valve, and HPCI will start.

C. REMAIN energized, and HPCI will remain tripped.

D. REMAIN de-energized, and HPCI will remain tripped.

Answer: C

**Answer Explanation**

| | |
|---|---|
| **ANSWER (C)** | **REMAIN energized, and HPCI will remain tripped. Correct:** When HPCI trips on high level, Trip solenoid SV1 energizes and dumps control oil from the Steam admission valve and speed governor. This causes the valve to close and HPCI stops rotating. This solenoid will remain energized until level drops below +54" and either the high level reset button is pushed or level drops below -38". |
| **DISTRACTOR (A)** | **energize and allow control oil to flow to the governor valve, and HPCI will start. Wrong:** Plausible misconception that HPCI will default to the most conservative condition and inject on a high drywell pressure and for those who do not recall that the trip solenoid is energized to remove oil from the HPCI governor valve, tripping the turbine. |
| **DISTRACTOR (B)** | **de-energize and allow control oil to flow to the governor valve, and HPCI will start. Wrong:** Plausible misconception that HPCI will default to the most conservative condition and inject on a high drywell pressure and does not recall that only resetting the high level trip or level below -38" will de-energize the solenoid. |
| **DISTRACTOR (D)** | **REMAIN de-energized, and HPCI will remain tripped. Wrong:** Plausible to the candidate who recalls the HPCI will remain tripped until the high level trip is reset but who doesn't understand the operation of the solenoid SV1. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200027 |
| User-Defined ID: | Q #31 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | HPCI design features and or interlocks which provide for control oil to turbine speed controls |
| 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** | 206000 K4.14 3.4 |
| **KA Statement** | High-Pressure Coolant Injection;<br>K4.14 - Knowledge of HIGH PRESSURE COOLANT INJECTION SYSTEM design feature(s) and or interlocks which provide for the following: Control oil to turbine speed controls: BWR-2,3,4. |
| **Cognitive level** | High |
| **Safety Function** | 2 - Reactor Water Inventor Control<br>4 - Heat Removal From Reactor Core |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | E41-1040-E-003, sht. 001 Rev 38<br>E41-1040-E-005, sht. 001 Rev 30<br>E41-1040-E-006, sht. 001 Rev 36<br>E41-1040-E-008, sht. 001 Rev 20 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0055.6, 8 |

**32** **ID: 2166255** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor is shutdown following an ATWS.
- All Control Rods are fully inserted.
- T-270, Terminate and Prevent Injection into the RPV, has been completed in the Main Control Room and Aux. Equipment Room
- Reactor pressure is 400 psig
- Core Spray (CS) injection to the Reactor has been directed from T-101

Given following Core Spray system component names:

HV-52-1F004A, Core Spray Loop "A" Injection Valve (outboard)
HV-52-1F005, Core Spray Loop "A" Injection Valve (inboard)
E21A-S22A(C), Core Spray DIV 1 (3) Manual Initiation PB

WHICH ONE of the following describes the steps necessary to align "1A" Core Spray Loop for injection?

A. Arm and depress E21A-S22A and C, open HV-52-1F004A and then open HV-52-1F005

B. Arm and depress E21A-S22A and C, close HV52-1F004A, open HV-52-1F005, re-open HV-52-1F004A

C. Manually start "1A" and "1C"Core Spray Pumps, open HV-52-1F004A and then open HV-52-1F005

D. Manually start "1A" and "1C" Core Spray Pumps, close HV-52-1F004A, open HV-52-1F005, re-open HV-52-1F004A

Answer: D

**Answer Explanation**

T-270 will disable the power monitor function of the CS pumps and associated logic. Moreover, the CS pumps will not start, nor will the valve logic recognize a LOCA signal, either real or manual.
As a result, if Core Spray is required the pumps must be manually started and all valve interlocks must be manually overridden. To override the injection valve logic the normally open HV-52-1F004A must be closed to enable the valve interlock permissive to open HV-52-1F005. Once the HV-52-1F005 is open, than the HV-52-1F004 Core Spray discharge valve can be reopened to align the CS loop for injection.

| | |
|---|---|
| **ANSWER (D)** | **Manually start "1A" and "1C" Core Spray Pumps, close HV-52-1F004A, open HV-52-1F005, re-open HV-52-1F004A. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **Arm and depress E21A-S22A and C, open HV-52-1F004A and then open HV-52-1F005. Wrong.**<br>This would be correct if T-270 did not prevent CS pump starts via manual or automatic LOCA signals and there was no valve interlocks to open HV-52-1F005 |
| **DISTRACTOR (B)** | **Arm and depress E21A-S22A and C, close HV52-1F004A, open HV-52-1F005, re-open HV-52-1F004A. Wrong.**<br>This would be correct if the candidate that does not recall that T-270 prevents CS pump starts via manual or automatic LOCA signals. |
| **DISTRACTOR (C)** | **Manually start "1A" and "1C"Core Spray Pumps, open HV-52-1F004A and then open HV-52-1F005. Wrong.**<br>Plausible to the candidate that does not recognize that HV-52-1F004A is a normally open valve and that with this valve open and no LOCA signal present, valve interlocks prevent the HV-52-1F005 from opening. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2166255 |
| User-Defined ID: | Q #32 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to manually operate and/or monitor CS Injection valves in the control room |
| 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** | 209001 A4.03 3.7 |
| **KA Statement** | Low-Pressure Core Spray Ability to manually operate and/or monitor in the control room: Injection valves. |
| **Cognitive level** | High |
| **Safety Function** | 2 - Reactor Water Inventory Control<br>4 - Heat Removal From Reactor Core |
| **10 CFR 55** | 41.7 / 45.5 to 45.8 |
| **Technical Reference with Revision No:** | T-270 Rev 16<br>E21-1040-E-5 Rev 18<br>E21-1040-E-6 Rev 19<br>E21-1040-E-9 Rev 26<br>E21-1040-E-11 Rev 20<br>E21-1040-E-12 Rev 20 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (561180, 977784) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0052.10B |

Used KA bank question 561180 which was ARCHIVED in lieu of 977784. Unable to find 977784.

**33** **ID: 2200028** **Points: 1.00**

Unit 2 Plant conditions:

- Reactor Mode Switch was placed in SHUTDOWN 10 minutes ago
- Reactor power is 30% lowering
- RPV Level (LI-42-2R604) stabilized at -75 inches two minutes ago
- SLC Tank level (LI-48-2R601) is 3500 gpm lowering

What best describes the expected SLC MCR indications?

| | XV-48-2F004A(B), SQUIB READY Status | PI-48-2R600A(B) Pump A(B) Discharge Pressure |
|---|---|---|
| A. | OFF | 1100 psig |
| B. | OFF | 1400 psig; |
| C. | ON | 1100 psig; |
| D. | ON | 1400 psig |

Answer: A

| **Answer Explanation** | |
|---|---|
| **ANSWER (A)** | **OFF, 1100 psig. Correct.** The conditions in the stem provide indications that an ATWS is in progress. With Rx power >3.2% and Rx Level < -38" for greater than 118 seconds SLC would have started 2 SLC pumps, fired the 2 associated explosive squib valves and begun injecting into the RPV. The indication of the SQUIB READY Status light OFF indicates that its associated Explosive Squib Valve has fired. The normal discharge pressure for the SLC pumps is 1100 psig. |
| **DISTRACTOR (B)** | **OFF, 1400 psig. Wrong.** Plausible to the candidate that mistakes the SLC discharge relief valve setpoint with the value for the SLC pump discharge pressure at rated RPV pressure during normal operation |
| **DISTRACTOR (C)** | **ON, 1100 psig. Wrong.** Plausible to the candidate that mistakes the SQUIB READY status light being ON as energized to operate as the squib valves must be energized to fire. |
| **DISTRACTOR (D)** | **ON, 1400 psig. Wrong.** Plausible to the candidate that mistakes the SQUIB READY status light being ON as energized to operate as the squib valves must be energized to fire. 1400 psig is plausible if the candidate mistakes the SLC discharge relief valve setpoint with the value for the SLC pump normal operation |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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 |
| | |
| System ID: | 2200028 |
| User-Defined ID: | Q #33 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the operational implications of Explosive Valve Ops as they apply to SLC. |
| 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** | 211000 K5.04 3.1 |
| **KA Statement** | Standby Liquid Control Knowledge of the operational implications of the following concepts as they apply to STANDBY LIQUID CONTROL SYSTEM: Explosive valve operation. |
| **Cognitive level** | HIGH |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.5 / 45.3 |
| **Technical Reference with Revision No:** | |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (558284) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0048.6 |

**34** **ID: 2167095** **Points: 1.00**

RPS Power Supply is in its normal alignment

At 0320 the following annunciators alarm
- 122 D12 G-2, 1DB-1 250 DC MCC Undervoltage
- 122 D12 G-3, 1DB-2 250 DC MCC Undervoltage

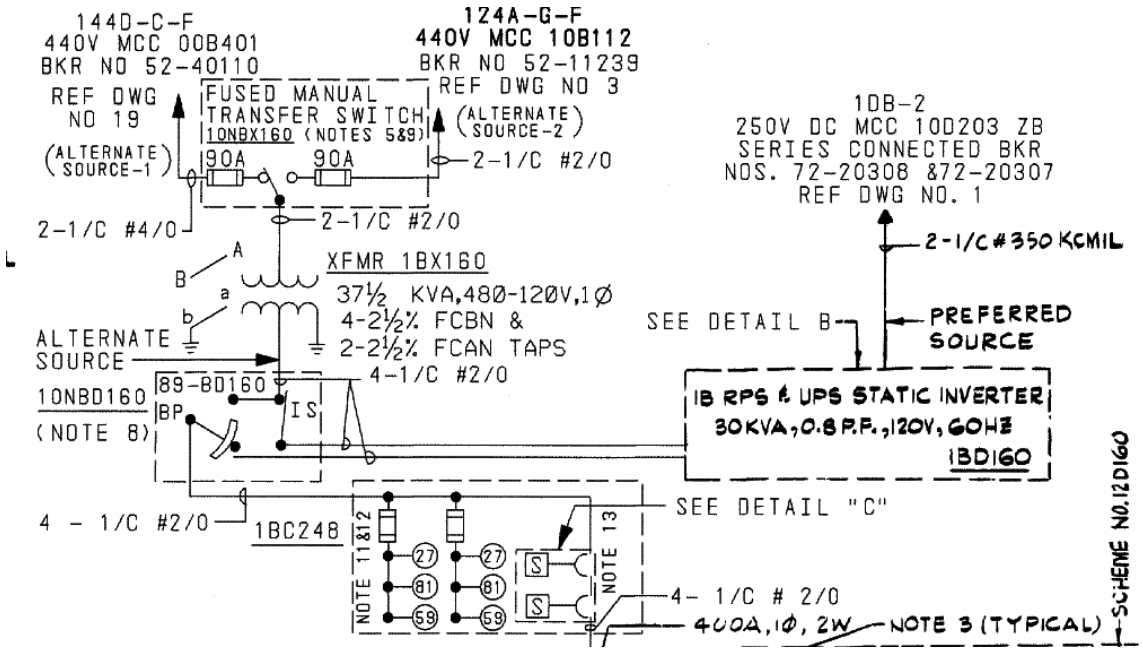
What is the status of Unit 1 "B' RPS Logic and where is 'B' RPS power supplied from?

| | Logic Status | Power Supply |
|---|---|---|
| A. | No Scram | 144D-C-F |
| B. | No Scram | 124A-G-F |
| C. | Half Scram | 144D-C-F |
| D. | Half Scram | 124A-G-F |

Answer: A

**Answer Explanation**

Each RPS subsystem (A/B) is powered via an UPS inverter. Each inverter can supply power from either its inverted DC which is supplied from Division 1 or Division 2 250V DC for A and B Subsystems respectively, or through an internal static switch from either the TSC inverter through 144D-C-F (normal) or from the 124A-G-F (backup) for B RPS.




On a loss of DC supply to an inverter, the internal static switch will power the inverter loads from the alternate source aligned.

The TSC power supply from 144D-C-F is preferred as it comes from an inverter in the TSC supplied by the TSC Battery System. This is the normal backup.

| | |
|---|---|
| **ANSWER (A)** | **No Scram,144D-C-F; Correct:** Since the static switch in the UPS will automatically power RPS from its alternate feed, there is no loss of power to RPS and no half scram. As noted above, 144D-C-F is correct alternate supply |
| **DISTRACTOR (B)** | **No Scram,124A-G-F, Wrong:** Plausible to the candidate that does not recall the normal backup supply and selects the alternate which is only manually aligned for maintenance of the TSC inverter. |
| **DISTRACTOR (C)** | **Half Scram, 144D-C-F; Wrong:**<br>The candidate may pick this because of the misconception that the static switch (automatic) and the UPS backup source transfer switch (manual, break before make) are the same component |
| **DISTRACTOR (D)** | **Half Scram,124A-G-F; Wrong:** The candidate may pick this because of the misconception that the static switch (automatic) and the UPS backup source transfer switch (manual, break before make) are the same component and they do not know that 144D-C-F is the normal backup power supply to the UPS RPS. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167095 |
| User-Defined ID: | Q #34 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the effect that a loss of DC will have on RPS |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 212000 K6.04 2.8 |
| **KA Statement** | Reactor Protection Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR PROTECTION SYSTEM: D.C. electrical distribution. |
| **Cognitive level** | LOW |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | E-32 sheet 1, E-33 sheet 1 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0071 9, 11 |

**35** **ID: 2168416** **Points: 1.00**

Unit 2 is operating at 100% power when the following occurs:

- 'SCRAM SYSTEM LOGIC' white light 'B3' on panel 20C603 extinguishes
- The EO investigating this failure reports that the fuse to the RPS B group 3 Scram solenoid valves has blown
- Prior to fuse replacement, a loss of power to 2A-Y160 A RPS/UPS panel occurs

WHICH ONE of the following correctly identifies the status of the control rods IMMEDIATELY after the loss of 2A-Y160?

A. Two solenoids have deenergized for one-quarter (1/4) of the control rods, one-quarter (1/4) of the control rods have scrammed into the core.

B. Only two of the 'SCRAM SYSTEM LOGIC' white lights have extinguished. No rods have scrammed

C. Two solenoids have deenergized for one half (1/2) of the control rods, one half (1/2) of the control rods have scrammed into the core.

D. Only four of the 'SCRAM SYSTEM LOGIC' white lights have extinguished. No rods have scrammed

Answer: A

**Answer Explanation**

There are 8 'Scram System Logic' white lights on panel 20C603, 4 across the top row and 4 across the bottom row. The top row lights are labeled 'A1', 'A2', 'A3', 'A4';(DS9A,C,E, &G) similarly, the bottom row lights are labeled 'B1', 'B2', 'B3', 'B4' (DS(B,D,F,&H). Each light monitors the availability of 120 VAC RPS power to the 'scram pilot valve solenoids' for a Group of control rods. For example: an illuminated 'B3' light means that RPS power is being supplied to the 'B' solenoids for the Group 3 rods (where 'Group 3' has approximately one-quarter of the 185 total control rods). Suppose that we consider (for this question) that the 'B3' light is extinguished...that means that 'B' solenoids (normally energized by RPS Trip System 'B' power) are de-energized for approximately one-quarter of the 185 control rods. Since the 'A' solenoids for those rods are still energized, the associated scram pilot valves have not re-positioned; therefor, the Scram Inlet and Scram Outlet Valves for each HCU remain closed (i.e., no scram occurs) however when a loss of 2A-Y160 occurs all 'A' side solenoids deenergize (A 1/2 scram). Since 'A'3 solenoids are deenergized along with 'B'3 solenoid 1/4 of the rods will initially scram into the core.

| | |
|---|---|
| **ANSWER (A)** | **Two solenoids have deenergized for one-quarter (1/4) of the control rods, one-quarter (1/4) of the control rods have scrammed into the core; Correct:** For the above reasons |
| **DISTRACTOR (B)** | **Only two of the 'SCRAM SYSTEM LOGIC' white lights have extinguished. No rods have scrammed; Wrong:** Plausible to the candidate who recalls that normally all solenoids must de-energize to cause rod motion. However, as described above, when both solenoids in a group de-energize, the associated rods scram. |
| **DISTRACTOR (C)** | **Two solenoids have deenergized for one half (1/2) of the control rods, one-half (1/2) of the control rods have scrammed into the core; Wrong:** Plausible to the candidate who concludes that since one of the white lights have de-energized prior to the loss of *AY160, only half of rods will scram since there is no A RPS and a loss of B3 . |
| **DISTRACTOR (D)** | **Only four of the 'SCRAM SYSTEM LOGIC' white lights have extinguished. No rods have scrammed; Wrong:** Plausible to the candidate who recalls that on a loss of *AY160, one half of the white lights will de-energize but fails to consider the impact of the blown fuse on group 3 rods. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| Question 35 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 |
| | |
| System ID: | 2168416 |
| User-Defined ID: | Q #35 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Scram Solenoid Logic Power loss |
| 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** | 212000 K5.02 3.3 |
| **KA Statement** | **Reactor Protection System** Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM: Specific logic arrangements. |
| **Cognitive level** | High |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.5 / 45.3 |
| **Technical Reference with Revision No:** | C71-1020-E-010 Rev. 028 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank (1151844) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0071.07A |

**36** **ID: 2200047** **Points: 1.00**

Unit 2 is in OPCON 2 with reactor startup in progress.

All IRM's are on Range 6 and reading as follows:

- "A" 37 / 125ths
- "B" 23 / 125ths
- "C" 31 / 125ths
- "D" 38 / 125ths
- "E" 28 / 125ths
- "F" 39 / 125ths
- "G" 33 / 125ths
- "H" 26 / 125ths

WHICH ONE of the following identifies the Rod Block and RPS status if all IRM Range Switches are positioned to Range 5?

A. Control Rod Withdraw Block ONLY

B. Control Rod Withdraw Block AND "A" side ½ Scram ONLY

C. Control Rod Withdraw Block AND "B" side ½ Scram ONLY

D. Control Rod Withdraw Block AND full Scram

Answer: C

**Answer Explanation**

| | |
|---|---|
| **ANSWER (C)** | **Control Rod Withdraw Block AND "B" side ½ Scram ONLY; Correct:** Ranging from 6 to 5 will multiply all readings by 3.16, which will result in exceeding 120/125ths on channel "D" and "F". Both of these channels input to "B" RPS resulting in a ½ scram. Any channel over 85/125ths results in a Rod Withdraw Block. |
| **DISTRACTOR (A)** | **Control Rod Withdraw Block ONLY; Wrong:** Plausible to the candidate who does not correctly calculate the impact of ranging down and determines only that 85% rod block has been exceeded. |
| **DISTRACTOR (B)** | **Control Rod Withdraw Block AND "A" side ½ Scram ONLY; Wrong:** Plausible to the candidate who incorrectly assigns IRMs to the wrong RPS channel. |
| **DISTRACTOR (D)** | **Control Rod Withdraw Block AND full Scram; Wrong:** Plausible to the candidate who incorrectly determines that F IRM inputs to A RPS while D IRM inputs to B RPS. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 36 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 |
| | |
| System ID: | 2200047 |
| User-Defined ID: | Q #36 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | IRM Range Switch change impact |
| 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** | 215003 A1.05 3.9 |
| **KA Statement** | Ability to predict and/or monitor changes in parameters associated with operating the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM controls including: SCRAM and rod block trip setpoints. |
| **Cognitive level** | High |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.5 / 45.5 |
| **Technical Reference with Revision No:** | ARC-MCR-108, F3 Rev 2<br>ARC-MCR-107, H3 Rev 1 |
| **Question History: (i.e. LGS NRC-05)** | No NRC |
| **Question Type: (New, Bank, Modified)** | BANK 591148 |
| **Revision History:** | |
| **Training Objective** | LGSOPS0074.19 |

| General Data | | |
|---|---|---|
| Technical Reference with Revision Number: | | Revision #: |
| Justification for Non SRO CFR Link: | | |
| Question History: (i.e. LGS NRC-05, OYS CERT-04) | NRC-05, LGS ILT07-1 CERT | |
| Question Source: (i.e. New, Bank, Modified) | | |
| Low KA Justification (if required): | | |
| Revision History: Revision History: (i.e. Modified distractor “b” to make plausible based on OTPS review) | | |
| ILT | | |
| Supplied Ref (If appropriate): (i.e. ABN-##) | | |
| Excluded Reference: (i.e. Ensure ON-## not provided) | Tech Specs 2.2.1 and 3.3.6 LLOT0250.08,09 | |
| LORT | | |
| PRA: (i.e. Yes or No or #) | | |
| LORT Question Section: (i.e, A-Systems or B-Procedures) | | |
| | | |

**37** **ID: 2167112** **Points: 1.00**

Unit 2 plant conditions are as follows:

- Reactor startup in progress
- ST-6-107-884-2, 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 | 3 |
| B | 3 |
| C | Channel is bypassed |
| D | 2 |
| E | 3 |
| F | 4 |
| G | 3 |
| H | 5 |

While being withdrawn, the indication for the "2A" 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: D

**Answer Explanation**

Per ARC-MCR-207, 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 (D)** | **Not Lit, Not active; Correct,** With all associated IRMs above range 2, the alarm is not lit and no rod block is active as described above |
| **DISTRACTOR (A)** | **Lit, Active; Wrong,** Plausible to the candidate who remembers that SRM Retract Permit becomes active when SRM level is <100 CPS but forgets that the IRM must be associated with the SRM |
| **DISTRACTOR (B)** | **Lit, Not Active; Wrong,** Plausible to the candidate who remembers that SRM Retract Permit becomes active when SRM level is <100 CPS but forgets that the IRM must be associated with the SRM and who does not recall the threshold for the Rod Block |
| **DISTRACTOR (C)** | **Not Lit, Active;** Wrong, Plausible to the candidate who correctly recalls that the SRM retract when not permit circuit is not active but who incorrectly assumes that the rod block is active due to the low count rate. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167112 |
| User-Defined ID: | Q #37 PREVIOUS |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to monitor automatic operations of the SRMs including: Annunciator and alarm signals. |
| 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 A3.02 3.4 |
| **KA Statement** | Source Range Monitor Ability to monitor automatic operations of the SOURCE RANGE MONITOR (SRM) SYSTEM including: Annunciator and alarm signals. |
| **Cognitive level** | High |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | GEK-73626A, Source Range Monitor Operation GEK-13962I, Detector Insert and Retract Mechanism Operation |
| **Question History: (i.e. LGS NRC-05)** | LGS NRC 2018 NRC |
| **Question Type: (New, Bank, Modified)** | BANK (2078352) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0074.06 |

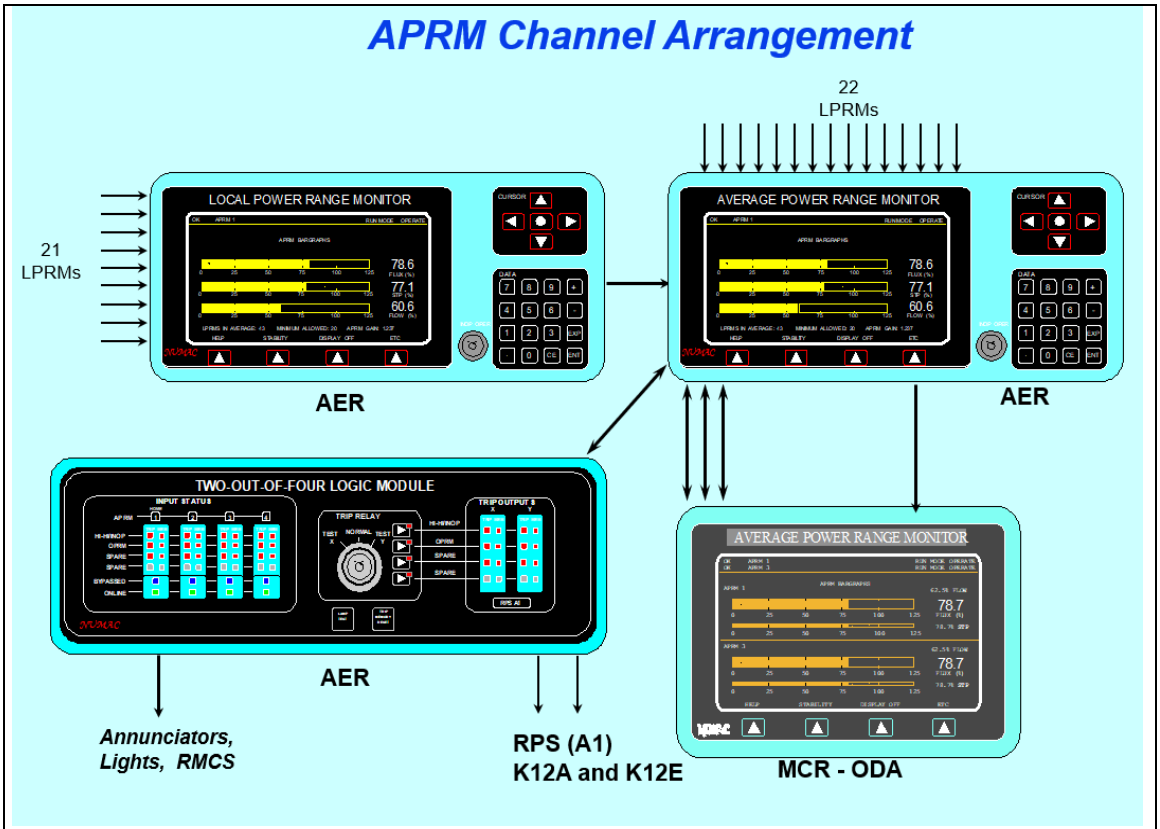
**38** **ID: 2200120** **Points: 1.00**

An **operable** APRM channel has at a **minimum** _(1)_ LPRM inputs per level and _(2)_ total LPRM inputs.

| | (1) | (2) |
|---|---|---|
| A. | 2 | 20 |
| B. | 2 | 21 |
| C. | 3 | 20 |
| D. | 3 | 21 |

Answer: C

**Answer Explanation**




| | |
|---|---|
| **ANSWER (C)** | **3, 20 Correct:**<br>Tech Spec table 3.3.1-1 (e) states: An APRM channel is inoperable if there are less than 3 LPRM inputs per level or less than 20 LPRM inputs to an APRM channel ... |
| **DISTRACTOR (A)** | **2, 20, Wrong:**<br>Plausible to the candidate that misremembers the 3 LPRM requirement and confuses it with 2 or greater requirement for operability. 20 per level is correct. |
| **DISTRACTOR (B)** | **2, 21 Wrong:**<br>Plausible to the candidate that misremembers the 3 LPRM requirement and confuses it with 2 or greater requirement for operability. 21 is plausible if the candidate remembers the total number of LPRMs input to the LPRM chassis for each APRM Channel. |
| **DISTRACTOR (D)** | **3, 21 Wrong:**<br>3 is correct. 21 is plausible if the candidate remembers the total number of LPRMs input to the LPRM inputs to the LPRM chassis for each APRM Channel. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2200120 |
| User-Defined ID: | Q #38 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the physical connections/cause-effect relationships between APRMs and LPRMs |
| 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** | 215005 K1.04 3.6 |
| **KA Statement** | Average Power Range Monitor/Local Power Range Monitor<br>Knowledge of the physical connections and/or cause-effect relationships between AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM and the following: LPRM channels. |
| **Cognitive level** | LOW |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.2 to 41.9 / 45.7 to 45.8 |
| **Technical Reference with Revision No:** | LPRM - UFSAR 7.6.1.4.4.1.1.b<br>APRM - UFSAR 7.6.1.4.5.1.1<br>RBM - UFSAR 7.7.1.6.2.1.1 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0074A.7 |

**39** **ID: 2167116** **Points: 1.00**

WHICH ONE of the following identifies the minimum operating speed limit for the RCIC turbine and the basis for the limit?

| | Minimum Speed | Basis |
|---|---|---|
| A. | 2200 RPM | Prevent exhaust line oscillations |
| B. | 2200 RPM | Provide adequate lube & control oil pressure |
| C. | 2500 RPM | Prevent exhaust line oscillations |
| D. | 2500 RPM | Provide adequate lube & control oil pressure |

Answer: B

**Answer Explanation**

RCIC Min speed is 2200 rpm to ensure proper lube to bearings via shaft attached lube oil pump since RCIC has no installed motorized lube oil pump

HPCI min speed is based on preventing exhaust line oscillations as the exhaust discharges under water and bubbles out. HPCI has a motor driven lube oil pump during startup and shutdown.

| | |
|---|---|
| **ANSWER (B)** | **2200 RPM, Provide adequate lube & control oil pressure. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **2200 RPM, Prevent exhaust line oscillations. Wrong.**<br>Plausible to the candidate that confuses RCIC min speed basis with that for HPCI. |
| **DISTRACTOR (C)** | **2500 RPM, Prevent exhaust line oscillations. Wrong.**<br>Plausible to the candidate that does not recall the RCIC Min Speed and recalls the procedurally directed value for min speed from RCIC test procedures and who confuses RCIC min speed basis with HPCI |
| **DISTRACTOR (D)** | **2500 RPM, Provide adequate lube & control oil pressure. Wrong.**<br>Plausible to the candidate that does not recall the RCIC Min Speed. and recalls the procedurally directed value for min speed from RCIC test procedures. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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 |
| | |
| System ID: | 2167116 |
| User-Defined ID: | Q #39 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | RCIC-Ability to explain and apply system limits and precautions |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 217000 G2.1.323.8 |
| **KA Statement** | Reactor Core Isolation Cooling<br>Ability to explain and apply system limits and precautions. |
| **Cognitive level** | LOW |
| **Safety Function** | 2 - Reactor Water Inventory Control<br>4 - Heat Removal From Reactor Core |
| **10 CFR 55** | 41.10 / 43.2 / 45.12 |
| **Technical Reference with Revision No:** | S49.1.D Rev44 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (555099) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0049.13 |

**40** **ID: 2167155** **Points: 1.00**

Unit 2 conditions:

- RPV Level: -135” down slow
- RPV Pressure: 600 psig
- LOCA signal occurred 15 minutes ago
- HPCI , RCIC and RHR Pumps are not available.
- Core Spray pump discharge pressures
    - 2A CS pump: 145 psig
    - 2B CS pump: 127 psig
    - 2C CS pump: 0 psig
    - 2D CS pump: 127 psig

Assume no operator action.

What is the status of ADS Divisional logic?

A. Only Division 1 logic has initiated

B. Only Division 3 logic has initiated

C. Both Division 1 and Division 3 logics have initiated

D. Neither Division 1 nor Division 3 logic has initiated

Answer: D

**Answer Explanation**

ADS will automatically initiate upon receiving an initiation signal from either Division 1 or Division 3 logic system.
Division 1 and Division 3 logic systems are divided into logic channels. "A" and "E" for Division 1, and "C" and "G" for Division 3.
Channel "A", Division 1, inputs for automatic initiation:

- High drywell pressure (1.68 psig) or 420 second high drywell pressure bypass timer timed out, and
- Low reactor water level (-129"), and
- Low confirmatory water level (+12.5"), and
- Time delay of 105 seconds, and
- RHR Pump "A" or "C" running (125 psig discharge pressure) or Core Spray Pump "A" running (145 psig discharge pressure)

Channel "E", Division 1, inputs for automatic initiation:

- High drywell pressure (1.68 psig) or 420 second high drywell pressure bypass timer timed out, and
- Low reactor water level (-129"), and
- RHR Pump "A" or "C" running (125 psig discharge pressure) or Core Spray Pump "C" running (145 psig discharge pressure)

When both Division 1 channels "A" and "E" initiation relays are energized, the "A" solenoid for each ADS valve is energized
Channels "C" and "G" of division 3 are similar to Channels "A" and "E" of division 1, with the following exceptions:

- Channel "C" pump running inputs are from RHR pump "B" or "D" or Core Spray Pump "B"
- Channel "G" pump running inputs are from RHR pump "B" or "D" or Core Spray pump "D"

Once both Division 3 channels "C" and "G" initiation relays are energized, the "B" solenoid for each ADS valve is energized.

The conditions given meet all of the condition for both Divisions to initiate with the exception of the required pumps. RHR is not available and there neither the A and C or B and D pump have sufficient discharge pressure (145 psig).

| | |
|---|---|
| **ANSWER (D)** | **Neither Division 1 nor Division 3 logic has initiated, Correct**<br>As described above. Without proper discharge pressure from either a RHR pump or a Core Spray Loop (both pumps) ADS will not initiate to preserve any HP injection which may be available. |
| **DISTRACTOR (A)** | **Only Division 1 logic has initiated, Wrong:**<br>Plausible to the candidate that recognizes the correct pump discharge pressure for the 2A CS pump but doesn't recall that both pump channels in the division must be satisfied to actuate the ADS logic |
| **DISTRACTOR (B)** | **Only Division 3 logic has initiated, Wrong:**<br>Plausible to the candidate the misremembers the actuation pressure for CS pumps as 125 psig vs 145 psig. 125 psig is for the RHR Pumps |
| **DISTRACTOR (C)** | **Both Division 1 and Division 3 logics have initiated, Wrong:**<br>Plausible to the candidate that misremembers the actuation pressure for Core Spray and that both pumps in a division must actuate for the ADS to initiate |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 40 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 |
| | |
| System ID: | 2167155 |
| User-Defined ID: | Q #40 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the effect that a loss or malfunction of CS Pressure has on ADS |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | This question meets the intent of the KA for knowledge of a malfunction in the LPCS system which impacts the ability of ADS to function. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 2 |
| **Group** | 1 |
| **KA # and Rating** | 218000 K6.02 4.1 |
| **KA Statement** | Automatic Depressurization Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM: Low pressure core spray system pressure: Plant-Specific. |
| **Cognitive level** | HIGH |
| **Safety Function** | 3 - Reactor Pressure Control |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | B21-1060-E |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0050.LO5 |

**41** **ID: 2201562** **Points: 1.00**

Due to a loss of Rx Enclosure Ventilation and D/P, operators are directed to perform S76.8.B Appx. 1, "Initiation of U1 RE Secondary Containment "B" Isolation Signal" hard card.

Given:

HV-59-101, Instrument Gas Suction
HV-59-102, Instrument Gas Suction
HV-59-129B, Instrument Gas Supply

Which of the following PCIV valve(s) would the operators expect to close based on that action?

A. HV-59-129B only

B. HV-59-129B and HV-59-101 only

C. HV-59-129B and HV-59-102 only

D. HV-59-129B, HV-59-101 and HV-59-102

Answer: C

**Answer Explanation**

On a Manual Secondary Containment Initiation, Instrument Gas will also isolate. Either the 101 (Inboard A) suction or the 102 (Outboard B) suction will isolate along with either the 129A suction valve or 129B respectively depending upon which isolation channel is initiated (A or B)

| | |
|---|---|
| **ANSWER (C)** | **HV-59-129B and HV-59-102 only; Correct.** As described above, the outboard valves will close on the 1B isolation command |
| **DISTRACTOR (A)** | **HV-59-129B only, Wrong:** Plausible to the candidate who does not recall all the valves which isolate on a "B" isolation command |
| **DISTRACTOR (B)** | **HV-59-129B and HV-59-101 only; Wrong:** Plausible misconception to the candidate who cannot recall which valve 101 or 102 is associated with the outboard isolation (B) |
| **DISTRACTOR (D)** | **HV-59-129B, HV-59-101 and HV-59-102; Wrong:** Plausible to the candidate that does not recall which valves are associated with the inboard and outboard isolations and assumes that all valves close on the B signal |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 41 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 |
| | |
| System ID: | 2201562 |
| User-Defined ID: | Q #41 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to predict/monitor changes in parameters associated with operating the PCIS: Valve Closures |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 223002 A1.02 3.7 |
| **KA Statement** | **Primary Containment Isolation/Nuclear Steam Supply Shutoff**: Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF SYSTEM controls including: Valve closures. |
| **Cognitive level** | Low |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.5 / 45.5 |
| **Technical Reference with Revision No:** | B21-1090E GE Elementary Drawing<br>GP-8.1, Automatic Actuations by Isolation Signals |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (555615) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0072.LO1, LO2, LO4 |

**42** **ID: 2168419** **Points: 1.00**

Unit 1 has scrammed from 75% power due to an inadvertent Group I Isolation

- RO is manually controlling RPV pressure with ADS SRVs in the pressure band 900 to 1000 psig
- Drywell pressure is 0.60 psig
- Suppression Pool pressure is 0.30 psig

A 1K SRV **Tailpipe Vacuum Breaker** fails open

One minute later, the RO cycles the 1K SRV to control pressure.

WHICH ONE of the following describes the predicted conditions and corrective action?

| | Expected Conditions | Corrective Action |
|---|---|---|
| A. | 1.20 psig in Drywell, 1.72 psig in the Suppression Pool | Vent the Drywell per OT-101, Hi Drywell Pressure |
| B. | 1.20 psig in Drywell, 1.72 psig in the Suppression Pool | Maximize Drywell Cooling per T-102, Pri. Cont. Control when Drywell temp exceeds 145°F |
| C. | 1.72 psig in Drywell, 0.30 psig in the Suppression Pool | Vent the Drywell per OT-101, Hi Drywell Pressure |
| D. | 1.72 psig in Drywell, 0.30 psig in the Suppression Pool | Maximize Drywell Cooling per T-102, Pri. Cont. Control when Drywell temp exceeds 145°F |

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **1.72 psig in Drywell, 0.30 psig in the Suppression Pool, Maximize Drywell Cooling when Drywell temp exceeds 145°F. Correct:** The SRV Vacuum Breaker is located in the DW just above the DW Floor. Should the vacuum breaker fail to close following its associated SRV actuation, any subsequent reopening of that same SRV will result in steam entering the DW with a subsequent rise in DW pressure. SP pressure will not begin to rise until a 5 psig differential exits between the DW and SP. T-102 is entered at 1.68 psig and 145ºF in the DW and directs bypassing and maximizing DW cooling (DW/T-5) and spraying the SP (PC/P-5). |
| **DISTRACTOR (A)** | **1.20 psig in Drywell, 1.72 psig in the Suppression Pool; Vent the Drywell per OT-101: Wrong:** Plausible to the candidate who believes the Vacuum breaker is in the SP. It is not. Vent the Drywell is plausible to the candidate that recalls that venting is permitted to lower DW pressure per OT-101 if no primary leak is present. With a failed Vacuum breaker, a primary leak is present and not allowed. |
| **DISTRACTOR (B)** | **1.20 psig in Drywell, 1.72 psig in the Suppression Pool, Maximize Drywell Cooling when Drywell temp exceeds 145°F. Wrong:** Plausible to the candidate who believes the Vacuum breaker is in the SP. It is not. |
| **DISTRACTOR (C)** | **1.72 psig in Drywell, 0.30 psig in the Suppression Pool, Vent the Drywell. Wrong:** Vent the Drywell is plausible to the candidate that recalls that venting is permitted to lower DW pressure per OT-101 if no primary leak is present. With a failed Vacuum breaker, a primary leak is present and not allowed. With Drywell pressure >1.68 psig, this vent path is isolated. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2168419 |
| User-Defined ID: | Q #42 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Predict the impacts of stuck open vacuum beakers on SRVs. |
| 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** | 239002.A2.01 3.0 |
| **KA Statement** | Safety Relief Valves Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open vacuum breakers. |
| **Cognitive level** | HIGH |
| **Safety Function** | 3 - Reactor Pressure Control |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | OT-101 REV.039<br>T-102 REV.028 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | |

**43** **ID: 2167499** **Points: 1.00**

Unit 2 is operating at 4% Reactor power during a startup.

RPV pressure is 960 psig

- 2A Rx Feed Pump (RFP) is operating in Startup Level Control on the LV-C-006-238A
- The reactor pressure transmitter inputting to the Feedwater Level Control system fails to 1100 psig

What is the response of the 2A RFP speed and reactor level 5 minutes later?

| | RFP Speed | Rx Level |
|---|---|---|
| A. | Rises | Rises |
| B. | Rises | No Change |
| C. | No Change | Rises |
| D. | No Change | No Change |

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **Rises, No Change; Correct**: FWLC operates in either level control mode or D/P mode. When operating in Level mode, the RFPs will respond to level changes by changing speed. More speed = more flow. In D/P mode, the RFP will maintain discharge pressure a constant D/P of approx. 330 psig > reactor pressure. In this question, the Rx pressure input fails high. This would cause the RFP to accelerate to raise discharge pressure. RFP speed is limited by the High speed stop (HSS) but its output pressure would rise dramatically. Level control in this mode is achieved by modulating the LV-C-006-238A level control valve. Changes in discharge pressure from the pump may cause a small level perturbation which will stabilize in 5 minutes at the initial level. |
| **DISTRACTOR (A)** | **Rises, Rises; Wrong:** Plausible misconception that a rise in RFP speed would lead to a rise in Reactor level due to additional flow. As noted above, the *38A valve would limit flow to the vessel and prevent level change |
| **DISTRACTOR (C)** | **No Change, Rises; Wrong:** Plausible to the candidate who incorrectly determines that since actual pressure didn't change, the pump speed would not change due to a soft Majority select function similar to level, but believes that the *38A is would open on a rising pressure signal similar to 3 element control to try to limit level dropping |
| **DISTRACTOR (D)** | **No Change, No Change; Wrong:** Plausible misconception that since actual pressure didn't change, the pump speed would not change and therefore the level would not change. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167499 |
| User-Defined ID: | Q #43 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | DFWLCS D/P Mode |
| 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** | 259002 K4.11<br>3.3 |
| **KA Statement** | Reactor Water Level Control; Knowledge of REACTOR WATER LEVEL CONTROL SYSTEM design feature(s) and or interlocks which provide for the following: DP control: Plant-Specific |
| **Cognitive level** | High |
| **Safety Function** | 2 - Rx Water Inventory |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | S06.1.D U/2<br>Rev. 009 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LLOT0550.11A |

**44** **ID: 2167757** **Points: 1.00**

Unit 1 was scrammed 10 minutes ago due to turbine vibration

- Feedwater is controlling level at 32 inches up slow in post scram level control
- T-100, "Scram/Scram Recovery" is being executed

The output of the LIC-006-138, "Startup Level Controller", fails to zero

The following alarm is received:

- 107-D5, FWLCS Trouble

Which of the following is the result of the failure and what procedure actions should be performed?

A. Reactor level remains as is, respond per S06.1.H, Responding to Alarms and Events at the FWLCS Operator Station", throttle flow with the HV-006-138A block valve

B. Reactor level lowers, inject to the vessel through the HV-006-120, "RFP Bypass Control Valve" per GP-3, "Plant Shutdown"

C. Reactor level continues to rise, emergency stop the 1A RFP per S06.1.D, "Post Scram Level Control"

D. Reactor level lowers, feed through the HV-006-108A, RFP A Discharge valve per S06.1.D, "Post Scram Level Control"

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **Reactor level lowers, feed through the HV-006-108A, RFP A Discharge valve per S06.1.D, "Post Scram Level Control"; Correct:** Given a controller output failure to zero, the Level control valve will close completely and no feedwater will inject. Manual operation of the controller will not work so the only method of putting water into the reactor is through the A RFP Discharge Valve 108A. S06.1.D has direction to place the RFP in service through the associated 108(*) valve. |
| **DISTRACTOR (A)** | **Reactor level remains as is, respond per S06.1.H, Responding to Alarms and Events at the FWLCS Operator Station", throttle flow with the HV-006-138A block valve; Wrong:** Plausible to the candidate who recalls that on a loss of air, the LVC-006-138 valve will fail as is for some period of time and assumes that this is the case for a loss of controller signal as well. In this instance, the valve fails closed. |
| **DISTRACTOR (B)** | **Reactor level lowers, inject to the vessel through the HV-006-120, "RFP Bypass Control Valve" per GP-3, "Plant Shutdown"; Wrong:** Plausible to the candidate who recognizes the valve is closed and believes that using the LVC-120 valve and controller to automatically control level would be appropriate. However, Rx pressure is too high for the LIC-120 controller which only has a rated pressure of 450 psig |
| **DISTRACTOR (C)** | **Reactor level continues to rise, emergency stop the 1A RFP per S06.1.D, "Post Scram Level Control"; Wrong:** Plausible misperception if a candidate assumed that the LVC-006-138 failed open on a loss of air similar to the FW heater dump valves, which fail open. Then, the level rise caused by this transient would require the operator to emergency stop the RFP per S06.1.D. In this case, the valve will fail closed. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167757 |
| User-Defined ID: | Q #44 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | DFWLCS Loss of Control Signal |
| 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** | 259002 A2.06<br>3.3 |
| **KA Statement** | Reactor Water Level Control; Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller output signal. |
| **Cognitive level** | High |
| **Safety Function** | 2 - Rx Water Inventory |
| **10 CFR 55** | 41.5 |
| **Technical Reference with Revision No:** | S06.1.H Rev. 015<br>OT-100<br>Rev. 038 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LLOT550.06 |

**45** **ID: 2201637** **Points: 1.00**

Unit 2 Reactor Enclosure (RE) HVAC system has isolated on a High Radiation signal

- Both SGTS trains auto initiated
- The 0B SGTS Fan was placed in Standby to secure it

A malfunction has caused the 0A SGTS fan to trip.

1) What will cause the 0B SGTS fan auto start and
2) What is the tech spec RE d/p limit that will be exceeded

| | 0B SGTS Fan Start | Low Tech Spec D/P Limit |
|---|---|---|
| A. | Low Rx Enclosure D/P condition | 0.25 inches H2O D/P |
| B. | Low Rx Enclosure D/P condition | 0.20 inches H2O D/P |
| C. | 0A SGTS low flow condition | 0.25 inches H2O D/P |
| D. | 0A SGTS low flow condition | 0.20 inches H2O D/P |

Answer: C

| **Answer Explanation** | |
|---|---|
| **ANSWER (C)** | **0A SGTS low flow condition, 0.25" H2O D/P; Correct:** On a trip of the running SGTS fan, the Standby fan would start when the operating fan experiences low flow through the fan for 15 seconds. During that period of time, D/P in the Rx Enclosure will rapidly decay dropping below both the Tech spec limit of 0.25 " as well as the low d/p alarm limit of 0.20" and the low isolation limit of 0.10". |
| **DISTRACTOR (A)** | **Low Rx Enclosure D/P condition, 0.25" H2O; Wrong:** Plausible misconception that the fan would start on Low D/P as that is one of the conditions that initiates a RE isolation and subsequent fan start. In this instance, the isolation is present already and the 0B fan is in standby |
| **DISTRACTOR (B)** | **Low Rx Enclosure D/P condition, 0.20" H2O; Wrong:** Plausible misconception that the fan would start on Low D/P as that is one of the conditions that initiates a RE isolation and subsequent fan start. In this instance, the isolation is present already and the 0B fan is in standby The second part is plausible that the tech spec low limit is the same as the low D/P alarm value. The actual Tech spec limit is 0.25" as described above. |
| **DISTRACTOR (D)** | **0A SGTS low flow condition, 0.20" H2O D/P: Wrong:** Plausible that the tech spec low limit is the same as the low D/P alarm value of 0.20". The fact that the T.S. limit is above the alarm setpoint is misleading. The actual Tech spec limit is 0.25" as described above. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2201637 |
| User-Defined ID: | Q #45 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-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** | 261000 K3.01 3.3 |
| **KA Statement** | Standby Gas Treatment Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on the following: Secondary containment and environment differential pressure. |
| **Cognitive level** | Low |
| **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 |

**46** **ID: 2167237** **Points: 1.00**

Unit 2 is operating at 20% power a during power ascension with the main generator synchronized to the grid.
House Loads have been transferred to the Aux Transformer per S91.6.A, TRANSFERRING HOUSE LOADS TO UNIT AUXILIARY TRANSFORMER

A Main Turbine trip and Generator lockout occurs.

WHICH ONE of the following describes the status of the Startup Source and the 13.2 KV ASD Supply Breakers following the Generator Lockout?

| | 10-22 and 20-21 Breakers | 13.2 KV ASD Breakers |
|---|---|---|
| A. | Closed | Closed |
| B. | Closed | Open |
| C. | Open | Closed |
| D. | Open | Open |

Answer: B

**Answer Explanation**

Actuating any one of the unit protection lockout relays will initiate the following actions:
(1) Trip of the Main Generator output breakers - Isolates fault to or from the main generator
(2) Trip of the Alterrex exciter field breaker - Limits internal damage to the Alterrex exciter
(3) Trip of the Main Turbine - Prevents main turbine overspeed due to loss of load
(4) Trip of the Stator Water Cooling pumps - Limits water input to the main generator stator if a stator bar has ruptured
(5) Auxiliary Bus fast transfer – 11, 12 or 21, 22 Busses transfer from the Main Generator to the Start-Up busses - Maintains power to selected vital loads
(6) Transfer of the main generator voltage regulator to MANUAL - Prevents voltage regulator damage
(7) Trip of the Reactor Recirculation pumps, if powered from the main generator - Minimizes reactor power during the transient
(8) Energization of the main generator output breaker failure circuit - To ensure main generator has been isolated from the 220 KV switchyard
(9) Trip of the main unit transformer cooling units - No need for cooling of main unit transformer, and/or to protect against a fault in the main unit transformer
(10)Trip of the unit auxiliary transformer cooling unit - No need for cooling of unit auxiliary transformer, and/or to protect against a fault in the unit auxiliary transformer

| | |
|---|---|
| **ANSWER (B)** | **Closed, Open. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **Closed, Closed. Wrong.**<br>Is incorrect as the 13.2 KV ASD Breakers trip on a Aux Bus Fast transfer. Plausible to the candidate who confuses the Fast Transfer trip with the RPT EOC trip which would not actuate at 20% power. |
| **DISTRACTOR (C)** | **Open, Closed. Wrong.**<br>Plausible misconception if a candidate recalls the operation of Unit 1 fast transfer breakers which are reversed on unit 2. On unit 1 the 10-11 would close but the 10-21 would not on U2, Likewise, on U1 the 20-12 will close but not the 20-22. On a turbine trip, the candidate may recall that the EOC function of the RPT breaker is triggered above 29% power and conflate that with the ASD 13.2KV breakers. The 13.2KV ASD breaker will trip on the MG output breaker trip as noted above. . |
| **DISTRACTOR (D)** | **Open, Open. Wrong**<br>Is incorrect since the startup breakers would be closed. Plausible to the candidate who does not recall the fast transfer action on a Generator Trip on Unit 2 |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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: | 0.00 |
| | |
| System ID: | 2167237 |
| User-Defined ID: | Q #46 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to predict and/or monitor changes in Breaker lineups in AC DIST. |
| 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** | 262001 A1.05 3.2 |
| **KA Statement** | AC Electrical Distribution Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: Breaker lineups. |
| **Cognitive level** | HIGH |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.5 / 45.5 |
| **Technical Reference with Revision No:** | S91.6.A<br>E-0001 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (1742911) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0035.5C |

**47** **ID: 2167240** **Points: 1.00**

Unit 1 and 2 plant conditions are as follows:

- 100% power
- Normal electrical lineup

A 201 Safeguard Bus bus lockout occurs.

Thirty (30) seconds later, WHICH ONE of the following identifies the breaker supplying power to D12 BUS and the breaker supplying power to D22 BUS?

| | D12 Bus Supply Breaker | D22 Bus Supply Breaker |
|---|---|---|
| A. | 101-D12 | D22 DG Output |
| B. | 101-D12 | 101-D22 |
| C. | D12 DG Output | D22 DG Output |
| D. | D12 DG Output | 101-D22 |

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **101-D12, 101-D22. Correct.**<br>The 101 Safeguard Bus normally supplies D11, D13, D22, and D24 Buses<br>The 201 Safeguard Bus normally supplies D12, D14, D21, and D23 Buses<br><br>During a 201 Safeguard Bus Lockout, the feed breaker (201 Transformer breaker) to the 201 Transformer opens and transformer's voltage drops to <70%. At this point the 201 feed breakers to their respective buses (D12 BUS for the question) trip open. Upon tripping of the 201-D12 feed breaker the 101-D12 feed breaker will close if the following conditions are met:<br>• 101-D11 breaker is connected,<br>• 201-D11 breaker control switch is RED flagged,<br>• D12 BUS voltage<40%,<br>• 1 sec T/D,<br>• 101 transformer feed voltage >70%,<br>• All lockout relays reset,<br>Along with the feeder breaker swap (1 sec) (D12-201 → D12-101) the D12 EDG will start after 0.5 seconds and remain running with its output breaker open in isochronous mode.<br><br>The D22 BUS is originally fed by the 101 Safeguard Bus through the 101-D22 breaker and is therefore not affected by the 201 bus lockout. |
| **DISTRACTOR (A)** | **101-D12 , D22 DG Output. Wrong:**<br>Plausible to the candidate who recalls that the D12 BUS is normally fed from the 201 bus and therefore assumes that D22 is as well, and that the 201 bus lockout effects the feed to the D22 BUS, thus allowing for a dead bus start an loading of the D22 DG. |
| **DISTRACTOR (C)** | **D12 DG Output, D22 DG Output. Wrong.**<br>Plausible to the candidate who recalls that the D12 BUS is normally fed from the 201 bus and therefore assumes that D22 is as well when it is actually fed from 101, and that EDGs will preferentially load on a dead bus. However, the diesels take 10 seconds to come up to speed and voltage |
| **DISTRACTOR (D)** | **D12 DG Output, 101-D22, Wrong.**<br>The candidate who wrongly recalls that the D12 BUS is normally fed from the 101 bus, (as its complement on Unit 2 is) and the 201 bus lockout effects the 101 bus feed to D12 BUS, thus allowing for a dead bus start and loading of the D12 DG. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167240 |
| User-Defined ID: | Q #47 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of AC Electrical Dist design/interlocks which provide for Bus Lockouts |
| 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** | 262001 K4.01 3.0 |
| **KA Statement** | AC Electrical Distribution Knowledge of A.C. ELECTRICAL DISTRIBUTION design feature(s) and or interlocks which provide for the following: Bus lockouts. |
| **Cognitive level** | HIGH |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | E-0001, E-0160 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0092A.LO4a, LO4b |

**48** **ID: 2201695** **Points: 1.00**

Unit 1 conditions:

- 8% power, Rx startup in progress
- Main Turbine is tripped
- '1A' Reactor Recirc Pump Speed 1000 RPM
- '1B' Reactor Recirc Pump Speed 1000 RPM

The following event then occurred:

- Loss of 1BY160, RPS UPS Power Supply

WHICH ONE of the following describes the status of the '1A and 1B' Reactor Recirc Pumps?

A. Both running at 1000 RPM

B. Both running at 28% Speed

C. 1A RRP running at 1000 rpm and 1B RRP tripped

D. Both tripped

Answer: D

**Answer Explanation**

From E-1BY160:

**1.0 CONFIRMING INDICATIONS**

1.1 The following is alarmed at ARC-MCR-122, D12:

- 1B RPS & UPS DIST PNL TROUBLE (Window F-4)

1.2 Reactor Half Scram

1.3 **IF** Main Turbine is tripped,
**THEN** both Recirculation (Recirc) Pumps trip

| | |
|---|---|
| **ANSWER (D)** | **Both tripped; Correct:**<br>As noted from the procedure, on a loss of the RPS/UPS power supply, either *A or *BY160, a running recirc pump will trip (RPT) if the Main Turbine is tripped. This is due to a loss of power supplying power to the 1st stage trip bypass circuit. On a subsequent Turbine trip or loss of *Y160, the trip circuit trips the RPT breakers. |
| **DISTRACTOR (A)** | **Both running at 1000 RPM; Wrong:**<br>Plausible to the candidate that does not recognize that a loss of the UPS bus with the turbine tripped would cause a RPT breaker trip. |
| **DISTRACTOR (B)** | **Both running at 28% speed; Wrong.**<br>Plausible misconception to the candidate that recalls the effect of a loss of the runback circuit UPS and confuses that with the loss of the RPS power supply. |
| **DISTRACTOR (C)** | **1A running at 1000 RPM, 1B Tripped; Wrong:**<br>Plausible to the candidate that recalls that the loss of the UPS would trip a recirc pump if the MT is tripped but believes it only affects that division.(1B) |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2201695 |
| User-Defined ID: | Q #48 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the effect that a loss/malfunction of the UPS will have on RRP Speed |
| 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** | 262002 K3.02 2.9 |
| **KA Statement** | Uninterruptable Power Supply (AC/DC) Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) will have on the following: Recirculation pump speed: Plant-Specific. |
| **Cognitive level** | High |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.7 / 45.4 |
| **Technical Reference with Revision No:** | E-1BY160 Rev.029 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS043.LO2g |

**49** **ID: 2203918** **Points: 1.00**

Unit 1 plant conditions are as follows:

- ARC-MCR-120 G1, 1 UNIT DIV 1 SFGD BATTERY CHARGERS TROUBLE, alarm has annunciated
- ARC Response results are as follows

AMMETER SELECTOR SWITCH in POSITION 1


AMMETER SELECTOR SWITCH in POSITION 2


Which of the following identifies (1) the battery charger that has the electrical problem, and (2) the long term effect on **ALL** Div 1 125 VDC loads if this condition is not corrected?

| | Battery Charger with an electrical problem | Long term effects on Div 1 125VDC Loads |
|---|---|---|
| A. | 1BCA1 (Position 1) | None of the loads will continue to function |
| B. | 1BCA1 (Position 1) | Approximately half of the loads will continue to function |
| C. | 1BCA2 (Position 2) | None of the loads will continue to function |
| D. | 1BCA2 (Position 2) | Approximately half of the loads will continue to function |

Answer: B

**Answer Explanation**

The division 1 safeguard DC system consists of 2 125 VDC Batteries and 2 125V DC Battery Chargers. The 1BCA1 Charger supports the 1A1 Battery (and is represented on A/AD101 when Ammeter Selector Switch is in position 1). The 1BCA2 Charger supports the 1A2 Battery (and is represented on A/AD101 when Ammeter Selector Switch is in position 2).

The 1BCA1 and 1A1 battery power 125V DC panels 1AD102 and 1AD162

The 1BCA2 and 1A2 battery power 125V DC panel 1AD501

Together they supply power to Div 1 250VDC Loads

| | |
|---|---|
| **ANSWER (B)** | **1BCA1 (Position 1), Approximately half of the loads will continue to function; Correct:** The meter in position 1 indicates that the battery is discharging (meter deflecting to the right). The meter in position 2 shows a charging current. Therefore, 1BCA1 is discharging.<br><br>Per the ARC(120-G1):<br>"On 1A-C661 place AS/AD101 "AMMETER SELECTOR SWITCH" in position "1" AND "2" to determine if a battery bank is discharging."<br><br>Long term (greater than 4 hours), the 1BCA1 battery will be depleted and when that occurs, the 125VDC loads that it supplies and the 250VDC loads will be lost. |
| **DISTRACTOR (A)** | **1BCA1 (Position 1), None of the loads will continue to function; Wrong:** Plausible to the examinee who incorrectly believes that the 1BCA1 battery supplies all 125VDC loads and would therefore be lost. |
| **DISTRACTOR (C)** | **1BCA2 (Position 2), None of the loads will continue to function; Wrong:** Plausible to the examinee who mis-interprets the ammeter indication and believes that the 1BCA2 battery is discharging and who does not recall that 125VDC loads are distributed between the two batteries. |
| **DISTRACTOR (D)** | **1BCA2 (Position 2), Approximately half of the loads will continue to function; Wrong:** Plausible to the candidate who mis-interprets the ammeter indication and believes that the 1BCA2 battery is discharging rather than the 1BCA1 |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| Question 49 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 |
| System ID: | 2203918 |
| User-Defined ID: | Q #49 MODIFIED |
| Cross Reference Number: | OPEN |
| Topic: | Loss of Battery Charger |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | Embedded Battery Ammeters showing discharging in position 1 and ammeter showing charging in position 2 |
| **K/A Justification** | None |
| **SRO-Only Justification** | N/A |
| **Additional Information** | None |

| General Data | | | |
|---|---|---|---|
| **Level** | RO | | |
| **Tier** | 2 | | |
| **Group** | 1 | | |
| **KA # and Rating** | 263000 A3.01 | | |
| **KA Statement** | DC Electrical Distribution **Ability to monitor automatic operations of the D.C. ELECTRICAL DISTRIBUTION including:** Meters, dials, recorders, alarms, and indicating lights | | |
| **Cognitive level** | High | | |
| **Safety Function** | 6 - Electrical | | |
| **10 CFR 55** | 41.7 | | |
| **Technical Reference with Revision No:** | E-0033 | **Rev #:** | 047 |
| **Question History: (i.e. LGS NRC-05)** | New | | |
| **Question Type: (New, Bank, Modified)** | Modified (**2078649)** | | |
| **Revision History:** | | | |
| **Training Objective** | LGSOPS0095.07 | | |

**50** **ID: 2167320** **Points: 1.00**

WHICH ONE of the following describes when starting air is secured to an Emergency Diesel Generator on a successful start?

A. Starting air pressure drops to 200 psig

B. Diesel Ready-to-Load (95%) relay energizes

C. Low Speed Relay energizes at 200 RPM

D. Ten (10) seconds after start sequence begins

Answer: C

**Answer Explanation**

Starting Sequence

a) Start signal energizes start relay and cranking time control relay
b) Start relay energizes the air vent and air start solenoids
c) Air start valves admit air to air distributors and booster servo motor forcing governor to full fuel position
d) Air vent solenoids close
e) Engine fires and speed increases to greater than 200 rpm when the Low Speed Relay energizes to:
    1) Disarm start and cranking time control relays
    2) De-energizes the standby lube oil and jacket water keep warm systems, pre-lube pump, and D/G space heater
    3) Initiates generator field flash
    4) Enables voltage regulator and governor remote control circuits unless diesel generator automatically started
    5) Energize combustion air temperature control valve
    6) Enables auto start of D/G enclosure vent exhaust fan
    7) Enables auto start of ESW pump (after time delay)
f) At 800 rpm the high speed relay energizes performing the following functions:
    1) Alarm delay relay is energized
    2) Alarm delay relay is TDC (10 seconds) to enable protective trips and de-energizes DC auxiliary fuel oil pump
g) Unsuccessful start causes start attempt to be aborted if 200 rpm is not reached within 7 seconds

| | |
|---|---|
| **ANSWER (C)** | **Low Speed Relay energizes at 200 RPM; Correct.**<br>At 200 RPM the LSR energizes and disarms the starting logic, securing starting air to the air start system. . |
| **DISTRACTOR (A)** | **Starting air pressure drops to 200 psig; Wrong:**<br>Plausible to the candidate that recalls that starting air low pressure LOW alarm occurs at 200 psig and the candidate may assume that air is secured. |
| **DISTRACTOR (B)** | **Diesel Read-to-Load (95%) relay energizes; Wrong:** Plausible to the candidate that recalls that the "Ready to Load" relay determines that the EDG is up to speed (95%) and therefore is used to secure air from the starting system. In actuality, this relay is used to signal the output breaker that voltage and speed are adequate for breaker closure. |
| **DISTRACTOR (D)** | **Ten (10) seconds after start sequence begins; Wrong:** Plausible to the candidate that recalls the 10 second Tech Spec initiation time for the EDG following a LOCA or LOOP. Or who recalls the Start failure alarm contact which will stop the cranking process after 7 seconds if the Low Speed Relay doesn't energize and the Start failure relay is set. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167320 |
| User-Defined ID: | Q #50 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of physical connections/cause-effect relationships between EDGs and the Starting Sys |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 264000 K1.06 3.2 |
| **KA Statement** | Emergency Generators (Diesel/Jet) EDG Knowledge of the physical connections and/or cause-effect relationships between EMERGENCY GENERATORS (DIESEL/JET) and the following: Starting system. |
| **Cognitive level** | Low |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.2 to 41.9 / 45.7 to 45.8 |
| **Technical Reference with Revision No:** | ARC-MCR-121 C2 Rev.000<br>ST-6-092-313-1 Rev.109 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0092B.LO3, LO4, LO7, LO10 |

**51** **ID: 2167375** **Points: 1.00**

Unit 2 Conditions

- ST-6-092-312-2, "D22 Diesel Generator Slow Start Operability Test Run", is in progress,
- D22 DG Load is 2750 KW
- '0B' RHRSW Pump is tagged out for maintenance

At 0134 a complete LOSS OF OFFSITE POWER occurs.

- D22 DG Load is 950 KW.

WHICH ONE of the following describes:
(1) What is the D22 EDG Frequency Control Mode after the LOOP.
(2) What is the order for starting the '2B' RHR and '0D' RHRSW pumps for suppression pool cooling.

| | (1) | (2) |
|---|---|---|
| A. | Droop | Start the '2B' RHR pump first then the '0D' RHRSW pump |
| B. | Droop | Start the '0D' RHRSW pump first then the '2B' RHR pump. |
| C. | Isochronous | Start the '2B' RHR pump first then the '0D' RHRSW pump |
| D. | Isochronous | Start the '0D' RHRSW pump first then the '2B' RHR pump. |

Answer: A

**Answer Explanation**

The DG was paralleled to the D22 Bus in droop mode to allow frequency control. When the LOOP occurs, the connection to offsite through the normally close 101-D22 breaker will be lost when the 101-D22 Breaker opens on 101 Bus transformer undervoltage. The D22 Bus remains powered from the DG. Since there is no LOCA or Dead Bus Start condition for the DG, it will remain in droop mode supplying D22 Bus.

The RHR pump is the largest load on each of the 4KV safeguard busses. S51.8.A and SE-10 both have procedural guidance to ensure a RHR pump is started with less than 1000 KW being carried by its respective DG to prevent DG overloading. In this case with the DG carrying 950 KW, starting an RHRSW pump first will raise DG over its 1000 KW limit. Thus, the RHR pump must be started first.

S51.8.A/SE-10 Caution:
IF the EDG is carrying the respective Bus,
THEN the EDG load must be below 1000 kW prior to starting an RHR Pump, to prevent loss of the other EDG loads.
Consider removing the following loads as required to obtain less than 1000 kW on the respective Bus:

- Core Spray 480 kW
- RHRSW Pump 557 kW
- ESW Pump 405 kW
- MCR Chiller 329 kW

| | |
|---|---|
| **ANSWER (A)** | **Droop, Start the '2B' RHR pump first then the '0D' RHRSW pump. Correct.**<br>As described above. |
| **DISTRACTOR (B)** | **Droop, Start the '0D' RHRSW pump first then the '2B' RHR pump. Wrong.**<br>Plausible to the candidate that does not recall the procedural guidance in SE-10 for limiting safeguard bus load to less than 1000KW for starting and RHR Pump when supplied by its EDG, but instead only considers its max continuous load rating of 2850KW. |
| **DISTRACTOR (C)** | **Isochronous, Start the '2B' RHR pump first then the '0D' RHRSW pump. Wrong.**<br>Plausible to the candidate that believes that once the LOOP occurs, and the DG is carrying the safeguard bus by itself, the DG will switch from droop to isochronous to maintain a constant bus frequency as it does during a LOCA/Dead Bus Start condition. |
| **DISTRACTOR (D)** | **Isochronous, Start the '0D' RHRSW pump first then the '2B' RHR pump. Wrong.**<br>Plausible to the candidate that believes that once the LOOP occurs, and the DG is carrying the safeguard bus by itself, the DG will switch from droop to isochronous to maintain a constant bus frequency as it does during a LOCA/Dead Bus Start condition. Plausible to the candidate that does not recall the procedural guidance in SE-10 for limiting safeguard bus load to less than 1000KW for starting and RHR Pump when supplied by its EDG, but instead only considers its max continuous load rating of 2850KW. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167375 |
| User-Defined ID: | Q #51 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Predict impact of Loss of Off Site power with DG full load testing |
| 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** | 264000 A2.07 3.5 |
| **KA Statement** | Emergency Generators (Diesel/Jet) EDG Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of off-site power during full-load testing. |
| **Cognitive level** | HIGH |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | E10/20, S51.8.A |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0092A.LO5A, LGSOPS0092B.LO2, LGSOPS1103.3 |

**52** **ID: 2167321** **Points: 1.00**

WHICH ONE of the following identifies the location of the breaker that supplies electrical power directly to 2BK101, 2B Instrument Air Compressor?

A. 224A

B. 224A-G-F

C. D244

D. D244-R-H

Answer: D

**Answer Explanation**

Refer to 2S15.1.A (COL-2), 2B Instrument Air Compressor Normal Operating Lineup. Page 7 of 7, Step 62 shows Div 4, 480 volt MCC D244-R-H supplying the 2BK101 compressor. Note - Although powered from a Divisional MCC, the compressor is shunt-tripped on a LOCA condition, meaning that the compressor will be load-shed and will not be available until operators "reset" the shunt trip device, then allowing a restart of the compressor (refer to SE-10-1, Breaker Reset Following a LOCA for more detail).

| | |
|---|---|
| **ANSWER (D)** | **D244-R-H. Correct**<br>Correct for the reason described above. |
| **DISTRACTOR (A)** | **224A. Wrong.**<br>224A is a non-safeguard 480 volt Load Center (LCC). This choice is plausible to the Examinee who concludes that the 2BK101 air compressor has a motor large enough as to be powered from an LCC and recalls that the Instrument Air Compressors are, themselves, non-safeguard qualified components (a fact). Incorrect because the compressors are divisionally safeguard powered, as described above. |
| **DISTRACTOR (B)** | **224A-G-F. Wrong.**<br>This is an MCC that is fed from the 224A LCC already described in choice 'A'. Plausible to the Examinee who does recognize that the air compressor motor is small enough to be powered from an MCC, but who nonetheless believes that the MCC is a non-safeguard one for the same reason as already described for choice 'A'. |
| **DISTRACTOR (C)** | **D244. Wrong.**<br>As already described, this is the LCC that powers MCC D244-R-H, but it is not the "location" of the circuit breaker. Plausible to the examinee who correctly recalls that the 2BK101 compressor is a Div 4 load, but who incorrectly recalls the size of its motor (i.e., believing it to be large enough so as to be powered directly from the LCC). |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 52 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 |
| | |
| System ID: | 2167321 |
| User-Defined ID: | Q #52 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of electrical power supplies to the Instrument air compressors. |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| Text Field: | LO-ILT |

Comments:

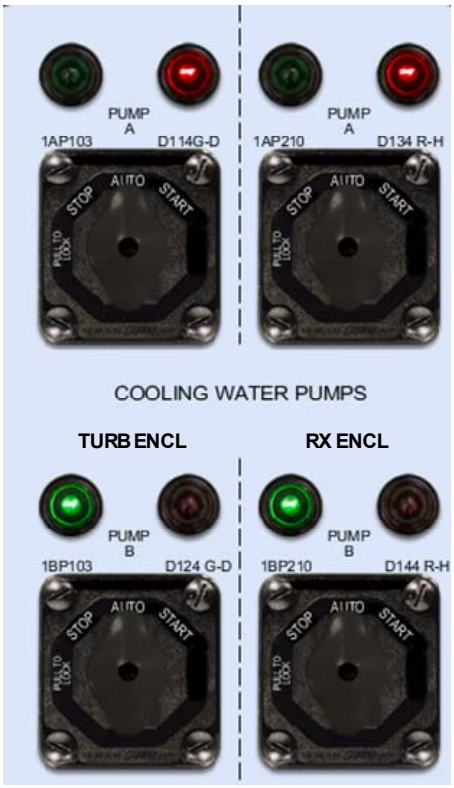
| | |
|---|---|
| **References Provided** | NONE |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 2 |
| **Group** | 1 |
| **KA # and Rating** | 300000 K2.01<br>2.8/2.8 |
| **KA Statement** | Instrument Air<br>Knowledge of electrical power supplies to the following: Instrument air compressor. |
| **Cognitive level** | Low |
| **Safety Function** | 8 - Plant Service System |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | 2S15.1.A (COL-4), Rev.6 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK(1149936) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0015.11, 12C |

**53** **ID: 2167515** **Points: 1.00**

Unit 1 conditions as follows

- Reactor Power is 100%
- TECW and RECW pump configuration is depicted below



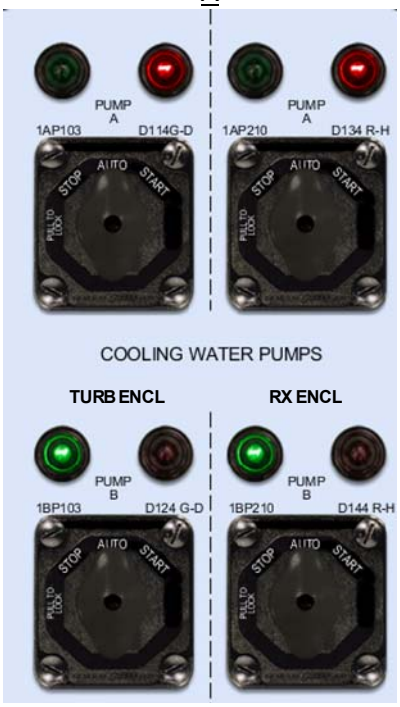

- RPV level drops to -150”

WHICH ONE of the following shows the status of the TECW and RECW pumps one minute after the level drop? (Assume NO Operator Action)

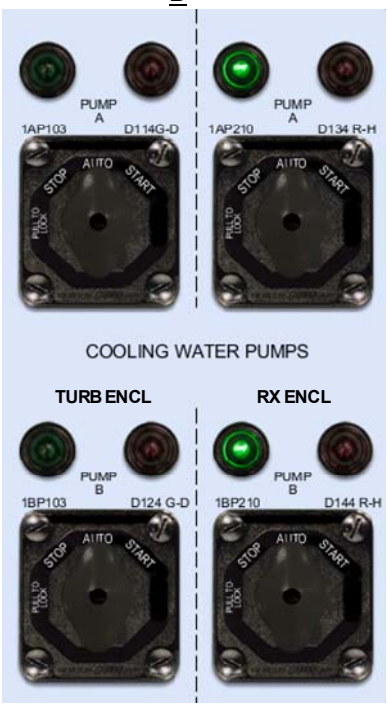
# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

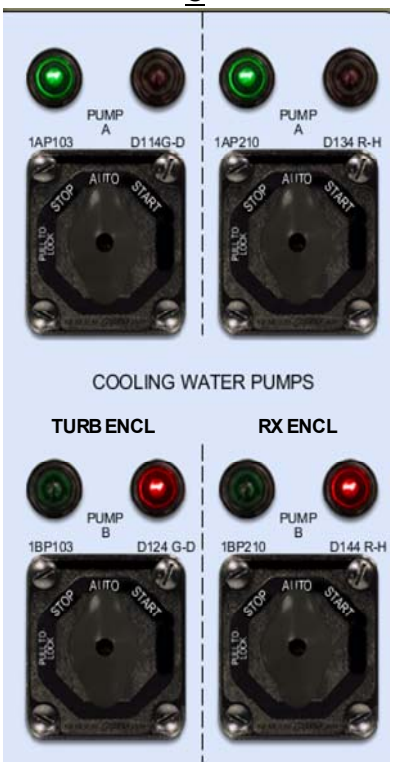
A



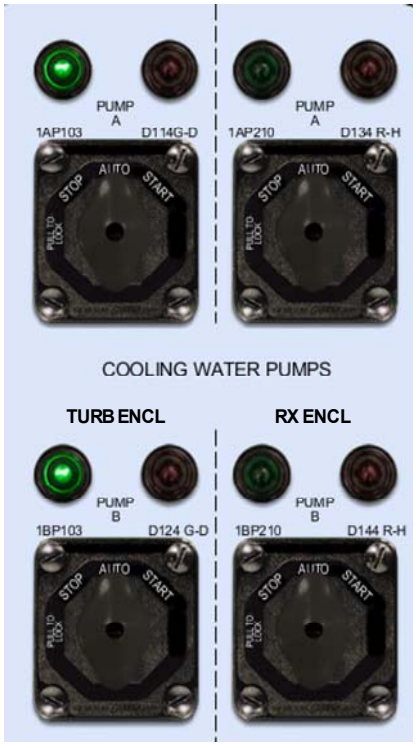

B




C




D



A. A

B. B

C. C

D. D

Answer: B

| **Answer Explanation** |
|---|
| Unit 1 will get a LOCA signal at -129" RPV Level. This will cause the D114, D124, D134, and D144 Load centers to load shed and then reclose after 3 seconds.<br>The D114-G-D MCC and D124-G-D MCC feeder breakers have an undervoltage trip which will drop out when their respective Load Centers are load shed.<br>The feeds for D114-G-D MCC and D124-G-D MCC are in the MCR and are reset following a LOCA signal by MCR operators as an immediate operator action. The stem of the question states assume no operator action, and with no operator actions the TECW pumps will remain de-energized with no indicating lights on due to the de-energized MCCs.<br><br>The RECW pumps will be de-energized for 3 second as their load centers load shed and then re-energize automatically. The associated pump MCCs do not have undervoltage relays on their feed breakers so they stay closed in. There is an interposing relay on the RECW pump logic that prevents it from restarting automatically when it trips on a LOCA signal. As a result, neither pump will restart. |

| | |
|---|---|
| **ANSWER (B)** | **B. Correct**<br>As described above. |
| **DISTRACTOR (A)** | **A. Wrong**<br>Plausible to the candidate that does not recognize that the TECW pumps are fed from the D114-G-D and D124-G-D MCCs. Plausible to the candidate that has the misconception that RECW pumps can restart automatically following a LOCA signal. |
| **DISTRACTOR (C)** | **C. Wrong**<br>Plausible to the candidate that does not recognize that the TECW pumps are feed from the D114-G-D and D124-G-D MCCs, or that the RECW pumps will not restart on a LOCA, but that the running pumps will start on low pressure. |
| **DISTRACTOR (D)** | **D. Wrong**<br>Plausible to the candidate that confuses the logic between the TECW and RECW pumps. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 53 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 |
| | |
| System ID: | 2167515 |
| User-Defined ID: | Q #53 NEW |
| Cross Reference Number: | OPEN - EMBEDDED PICTURE |
| | |
| Topic: | Ability to manually operate and/or monitor in the control room: CCW indications and control. |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | Embedded Picture - RECW, TECW control panel switches and status lights |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 2 |
| **Group** | 1 |
| **KA # and Rating** | 400000 A4.01 3.1 |
| **KA Statement** | Component Cooling Water Ability to manually operate and/or monitor in the control room: CCW indications and control. |
| **Cognitive level** | HIGH |
| **Safety Function** | 8 - Plant Service Systems |
| **10 CFR 55** | 41.7 / 45.5 to 45.8 |
| **Technical Reference with Revision No:** | E-565 Rev 10 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0013.LO7A |

**54** **ID: 2168460** **Points: 1.00**

Performance of surveillance test ST-6-107-760-2, "Control Rod Exercise", is in progress:

- Control rod 18-19 showed the following indication on the 4-Rod Display following a single notch insert :
  48, BLANK, - -, BLANK, 46, BLANK, - -, BLANK, 46
- Later during the test MCR Annunciator 108 REACTOR E-4, "RDCS Inoperative", alarmed and RDCS cannot be reset.
- The last performance of ST-6-107-760-2, "Control Rod Exercise", was started at 1300 on 4/30/21.

WHICH ONE of the following describes:
(1) the stroke speed indication on the 4-Rod Display for control rod 18-19?
(2) the latest this surveillance test can be completed and remain in surveillance?

| | (1) | (2) |
|---|---|---|
| A. | Fast Speed | 1300 7/31/21 |
| B. | Fast Speed | 1300 8/23/21 |
| C. | Normal Speed | 1300 7/31/21 |
| D. | Normal Speed | 1300 8/23/21 |

Answer: B

**Answer Explanation**

Per ST-6-107-760-2
Fast control rod stroke speed is indicated by any of the following:

- The rod appears to be traveling faster than 3 inches per second (Normal is from notch 48 to 46 in about 2 seconds, or from position 46 to 48 in about 1.5 seconds).
- A rod inserts beyond the next odd position on a single notch insert. Normal insert on 4-Rod Display is position "48", a blank " ", then the odd reed switch "- -", then " ", then "46" and " " (as the rod moves up past 46 so it can settle back down to 46) and then back to "46". A fast rod would indicate as follows: "48", " ", "- -", " ", "46", " ", "- -", " ", "46".
- A rod that withdraws to the next position before the settle function begins. A rod should settle, not drive, into the next notch.

From the cover page of ST-6-107-760-2
The test frequency is 92 days. 92 days from the last completion date of 1300 4/30/21 is 1300 7/31/21. However a grace period of 25% of the test frequency is allowed (TS 4.0.2, WC-AA-111) to prevent the test from going out of surveillance. Therefore:
92 days X 1.25 = 115 Days --> 1300 8/23/21

| | |
|---|---|
| **ANSWER (B)** | **Fast Speed, 1300 8/23/21. Correct.**<br>As described above |
| **DISTRACTOR (A)** | **Fast Speed, 1300 7/31/21. Wrong.**<br>Plausible to the candidate that believes 92 day frequency on the ST cover page must be met to remain in surveillance. |
| **DISTRACTOR (C)** | **Normal Speed, 1300 7/31/21. Wrong.**<br>Plausible to the candidate that does not recognized an incorrect behavior for a control rod for a single notch insert signal and who believes 92 day frequency on the ST cover page must be met to remain in surveillance. |
| **DISTRACTOR (D)** | **Normal Speed, 1300 8/23/21. Wrong.**<br>Plausible to the candidate that does not recognized an incorrect behavior for a control rod for a single notch insert signal |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 54 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 |
| | |
| System ID: | 2168460 |
| User-Defined ID: | Q #54 NEW |
| Cross Reference Number: | OPEN |
| | |
| Topic: | Knowledge of surveillance procedures. |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | ST-6-107-760-2 Pages 1-6 |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 2 |
| **Group** | 2 |
| **KA # and Rating** | 201002 G2.2.12 |
| **KA Statement** | Reactor Manual Control Knowledge of surveillance procedures. |
| **Cognitive level** | HIGH |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.10 / 45.13 |
| **Technical Reference with Revision No:** | WC-AA-111, ST-6-107-760-2 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0046 |

**55** **ID: 2167597** **Points: 1.00**

LGS Unit 1 is at 100% CTP when a reactor scram occurs.

WHICH ONE of the following is correct when the control rods scram?

Scram water/pressure is provided _____.

A. by reactor pressure ONLY

B. by accumulator pressure ONLY

C. by reactor pressure first and then by accumulator pressure

D. by accumulator pressure first and then by reactor pressure.

Answer: D

**Answer Explanation**

When a rod scrams with reactor at pressure, accumulator pressure is initially GT reactor pressure and initially inserts the rod. Eventually accumulator pressure decreases below reactor pressure and then reactor pressure inserts the rod.

| | |
|---|---|
| **ANSWER (D)** | **by accumulator pressure first and then by reactor pressure. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **by reactor pressure ONLY. Wrong.**<br>Plausible to the candidate with a misperception that the purpose of the HCU accumulator is to act as a back-up insertion method to an RPV depressurization event. |
| **DISTRACTOR (B)** | **by accumulator pressure ONLY. Wrong.**<br>Plausible to the candidate that recognizes reactor pressure at 100% CTP (1043 psig) to be less than that of accumulator pressure, which is maintained 1050-1150 psig and who does not recall that an internal ball check valve in the CRDM will reposition to port reactor pressure to the underside of the drive piston as Accumulator pressure lowers below Reactor pressure. |
| **DISTRACTOR (C)** | **by reactor pressure first and then by accumulator pressure. Wrong.**<br>Plausible to the candidate that considers reactor pressure at 100% CTP (1043 psig) to be greater than that of accumulator pressure, which is maintained 1050-1150 psig. And then expects the internal ball check valve in the CRDM will reposition to port Accumulator pressure to the underside of the drive piston as reactor pressure lowers due to CR insertion. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167597 |
| User-Defined ID: | Q #55 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of CRDM design feature(s) which provide for the use of either accumulator/Reactor Pressure |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 2 |
| **KA # and Rating** | 201003 K4.04 3.6 |
| **KA Statement** | Control Rod and Drive Mechanism<br>Knowledge of CONTROL ROD AND DRIVE MECHANISM design feature(s) and/or interlocks which provide for the following: The use of either accumulator or reactor water to SCRAM the control rod. |
| **Cognitive level** | LOW |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | |
| **Question History: (i.e. LGS NRC-05)** | Columbia 4/2011 #58 |
| **Question Type: (New, Bank, Modified)** | BANK(Columbia 4/2011 #58) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0046A.8D |

**56** **ID: 2167603** **Points: 1.00**

Unit One is operating at 31% power when the Steam Flow input from the DFWLCS to the Rod Worth Minimizer (RWM) has failed to 16%

WHICH ONE of the following identifies the effect this will have, if any, on the RWM?

The RWM will be operating _____.

A. below the Low Power Set Point, alarms are active and rod blocks due to control rod mispositionings are enforced

B. above the Low Power Alarm Point, alarms are not active and rod blocks due to control rod mispositionings are not enforced

C. between the Low Power Set Point and Low Power Alarm Point, alarms are active but rod blocks due to control rod mispositionings are not enforced

D. between the Low Power Set Point and Low Power Alarm Point, alarms are not active and rod blocks due to control rod mispositionings are not enforced

Answer: C

**Answer Explanation**

**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)

1. The Rod Worth Minimizer (RWM) monitors each control rod selection and requested movement.
2. It compares the selection and movement called for to a prescribed sequence of control rod movements.
3. If the request is not in accordance with the prescribed sequence, control rod blocks will be applied.
    a. The control rod block is initiated when the RWM removes the rod motion permissive signal from the Rod Drive Control System (RDCS)

**Between LPSP and Low Power Alarm Point (LPAP)**: (15.9 to 30%)

1. The RWM still functions to provide indications (errors) for out of sequence control rods, but will not impose rod sequence control rod blocks. (RWM failures can cause rod blocks)
2. This area is known as the transition zone

**Above LPAP**: >30% Reactor Power, as sensed by the Total Steam Flow signal from the DFWLCS

1. Will no longer display out of sequence control rods (errors) unless the Operator recalls it.

A single steam flow indicator failing will result in a total steam flow signal remaining at 31%. The DFWLCS will remove the faulty indication from the total steam flow calculation and recalculate it as :

%Total Steam Flow $= \underline{\dot{m}_{stm1}\% + \dot{m}_{stm2}\% + \dot{m}_{stm3}\%}$ X 4. In this case the %Total Steam Flow value fails to 16%.

3

| | |
|---|---|
| **ANSWER (C)** | **between the Low Power Set Point and Low Power Alarm Point, alarms are active but rod blocks due to control rod mispositionings are not enforced; Correct:**<br>As described above with steam flow at 16%, the RWM senses power in the transition region and as described above will provide alarms for mispositioning but not rod blocks. |
| **DISTRACTOR (A)** | **below the Low Power Set Point, alarms are active and rod blocks due to control rod mispositionings are enforced; Wrong:**<br>Misconception that 16% steam flow is below the LPSP. The LPSP deactivates at 15.9% rising. |
| **DISTRACTOR (B)** | **above the Low Power Alarm Point, alarms are not active and rod blocks due to control rod mispositionings are not enforced; Wrong:**<br>Plausible since the Unit 1 is operating at 31% power which is above the LPAP. |
| **DISTRACTOR (D)** | **between the Low Power Set Point and Low Power Alarm Point, alarms are not active and rod blocks due to control rod mispositionings are not enforced; Wrong:** Plausible to the candidate that recognizes that the LPAP is active but does not recall the function of the LPAP to prepare for LPSP active on a shutdown. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 56 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 |
| | |
| System ID: | 2167603 |
| User-Defined ID: | Q #56 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the effect that a loss/ malfunction of steam flow input will have on the RWM |
| Num Field 1: | LM |
| Num Field 2: | RO-Low |
| 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** | 2 |
| **KA # and Rating** | 201006 K6.05 2.7 |
| **KA Statement** | Rod Worth Minimizer Knowledge of the effect that a loss or malfunction of the following will have on the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC): Steam flow input: P-Spec (Not-BWR6). |
| **Cognitive level** | Low |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | GEK-94966C - RWM Operating Manual |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0073B.LO4 |

**57** **ID: 2167676** **Points: 1.00**

Unit 1 conditions:

- Reactor Power = 70%
- OPRMs are Operable

1A Reactor Recirc Pump Trips

- Rx Power drops to 50%
- 1B RRP Speed = 990 RPM
- Total Core Flow (FR-043-1R613) indication is 47 mlbm/hr
- Core plate D/P (FR-043-1R613) = 2.25 psid
- P-1 results indicate MFLCPR = 1.001

(1) What is actual core flow?
(2) What actions are REQUIRED, if any?

| | (1) | (2) |
|---|---|---|
| A. | 47 mlbm/hr | No action required |
| B. | 47 mlbm/hr | Insert control rods |
| C. | 50 mlbm/hr | No action required |
| D. | 50 mlbm/hr | Insert control rods |

Answer: D

**Answer Explanation**

With the 1A RRP tripped, the core flow subtraction is in effect. Therefore, the indicated total core flow is the operating loop jet pump flow minus the non-operating jet pump flow. The bases of OT-112 states that with RRP speed less than 1000 RPM, core plate D/P be used for determining N/F Map position rather than indicated total core flow. Using core plate D/P and Reactor Power information to plot on the provided N/F Map, it is determined that the P/F point is outside of the restricted region at 50 mlbm and 50% power.

However, MFLCPR at 1.001 is an entry into GP-14 for a thermal limit violation which requires inserting control rods to exit.

| | |
|---|---|
| **ANSWER (D)** | **50 mlbm/hr, Insert control rods; Correct:**<br>As described above |
| **DISTRACTOR (A)** | **47 mlbm/hr, No action required; Wrong:**<br>Plausible to the candidate that uses the Core Flow Indication for flow rather than core plate D/P. Also No action is plausible if the candidate evaluates the P/F map and determines that operating point is in the safe zone. However, MFLCPR >1.0 requires rod insertion |
| **DISTRACTOR (B)** | **47 mlbm/hr, Insert control rods; Wrong:**<br>Plausible to the candidate that uses the Core Flow Indication for flow rather than core plate D/P. |
| **DISTRACTOR (C)** | **50 mlbm/hr, No action required; Wrong:**<br>Plausible if the candidate evaluates the P/F map and determines that operating point is in the safe zone. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167676 |
| User-Defined ID: | Q #57 NEW |
| Cross Reference Number: | OPEN |
| | |
| Topic: | Ability to predict impacts of a RRP Trip on Recirc Flow Control System, and take action |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | OT-112 Attachment 4 |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 2 |
| **Group** | 2 |
| **KA # and Rating** | 202002 A2.01 3.4 |
| **KA Statement** | Recirculation Flow Control Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Recirculation pump trip. |
| **Cognitive level** | HIGH |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 41.5 / 45.6 |
| **Technical Reference with Revision No:** | OT-112 Rev. 062<br>GP-14 Rev. 008 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS-043A.LO13 |

**58** **ID: 2167683** **Points: 1.00**

Unit 1 plant conditions are as follows:

- Reactor power is 95%
- Traversing In-Core Probe (TIP) scans are in progress using only '1A' TIP machine.

A Main Turbine trip occurs, resulting in the following:

- RCIC and HPCI automatically start on a valid low RPV level signal.

WHICH ONE of the following describes the expected position of the TIP Shear and Ball Valves for the '1A' TIP Drive two (2) minutes later?
(Assume NO operator action)

| | Shear Valve | Ball Valve |
|---|---|---|
| A. | Open | Open |
| B. | Open | Closed |
| C. | Closed | Open |
| D. | Closed | Closed |

Answer: B

**Answer Explanation**

HPCI and RCIC auto start on a -38 inch RPV level signal, which is also an isolation signal for the TIPs. When a containment isolation signal is received and the TIP system is in use, the TIP drive automatically shifts to manual reverse and withdraws the detector to the shield, and the ball valve closes. Only if the drive malfunctions, and the detector cannot be withdrawn, is the shear valve closure manually initiated. The shear valve will cut the TIP cable and seal the penetration.

| | |
|---|---|
| **ANSWER (B)** | **Open, Closed. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **Open, Open. Wrong.**<br>Plausible to the candidate that does not recall the RCIC and HPCI low RPV level start at -38" is the same RPV level that actuates a TIP isolation. |
| **DISTRACTOR (D)** | **Closed, Closed. Wrong.**<br>Plausible misconception that the shear valve is an automatically actuated isolation valve. The shear valve is completely manual and has no automatic action. |
| **DISTRACTOR (C)** | **Closed, Open. Wrong.**<br>Plausible to the candidate that does not recall the that the operation of the shear valve is completely manual and has no automatic action and concludes the shear valve and not the ball valve is the normal means of penetration closure in the event of an isolation initiation. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 58 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 |
| | |
| System ID: | 2167683 |
| User-Defined ID: | Q #58 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Predict/monitor changes in params associated with operating the TIP controls incl valve status |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 2 |
| **KA # and Rating** | 215001 A1.03 2.6 |
| **KA Statement** | Traversing In-Core Probe Ability to predict and/or monitor changes in parameters associated with operating the TRAVERSING IN-CORE PROBE controls including: Valve status: Mark-I&II (Not-BWR1) |
| **Cognitive level** | LOW |
| **Safety Function** | 7 - Instrumentation |
| **10 CFR 55** | 41.7 / 45.4 |
| **Technical Reference with Revision No:** | S74.0.B<br>GP 8.1 U/1 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK(561310) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0074C.LO6 |

**59** **ID: 2167697** **Points: 1.00**

Unit 2 plant cooldown is in progress, with the following:

- Shutdown Cooling (SDC) is in service.
- RPV level is 95 inches
- Trip unit LIS-42-2N680B, "RPV Low Level 3 Trip", has been taken to 'TEST' and is reading 35 inches

Then:

- Actual RPV level drops to zero (0) inches.

Five minutes later, WHICH ONE of the following identifies the status of the SDC Suction Inboard Isolation (HV-51-2F009) and Outboard Isolation (HV-51-2F008)?

| | HV-51-2F009 INBOARD | HV-51-2F008 OUTBOARD |
|---|---|---|
| A. | Closed | Closed |
| B. | Closed | Open |
| C. | Open | Closed |
| D. | Open | Open |

Answer: C

**Answer Explanation**

Per GP-8.1, the low reactor level isolation signal A (+12.5 inches RPV level) requires both channels to actuate for the SDC valves to close. A and B (inbd) or C and D (outbd).

GP-8.1, Rev. 14
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*** * UNIT 2 ONLY * *** **A**

**A: REACTOR LEVEL 3 - LOW** RESET - R1

Group IIA - RHR S/D Cooling (Other Signal: V)

| EQUIPMENT | NAME | POSITION | CHANNEL | BYPASS |
|---|---|---|---|---|
| HV-51-2F009 | "RHR S/D Clg Suction" (INBD) | Close | A & B | None |
| HV-51-2F008 | "RHR S/D Clg Suction" (OUTBD) | Close | C & D | None |
| HV-51-2F050A(B) | "RHR S/D Clg Rtn Ck" (INBD) | Close | A & B | None |
| HV-51-251A(B) | RHR S/D Clg Rtn Ck Equal" (TEST) | Close | A & B | None |
| HV-51-2F015A(B) | RHR S/D Clg Rtn" (OUTBD) | Close | C & D | None |

2. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION

a. Reactor Vessel Water Level Low - Level 3 ≥ 12.5 inches*

b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High ≤ 75 psig

| | |
|---|---|
| **ANSWER (C)** | **Open, Closed. Correct.**<br>The candidate determines that RPV level is below the RPV level Isolation signal setpoint (+12.5 inches) and correctly determines that with “B” Channel instrument being vented and its trip unit set to a non trip value, the isolation will occur on only the outboard HV-51-1F008 isolation valve. |
| **DISTRACTOR (A)** | **Closed, Closed. Wrong**<br>Plausible to the candidate that both confuses the inboard and outboard valve associations (gets them backwards) and confuses the logic for the SDC isolation based on RPV level (need 2 channels per isolation system) with the SDC isolation based on RPV Pressure (need 1 channel per isolation system) |
| **DISTRACTOR (B)** | **Closed, Open. Wrong.**<br>Plausible to the candidate that confuses the inboard and outboard valve associations (gets them backwards). |
| **DISTRACTOR (D)** | **Open, Open. Wrong**.<br>Plausible if the candidate that incorrectly recalls the RPV level Isolation signal setpoint (+12.5) and believes an isolation signal has not yet been met. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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 |
| | |
| System ID: | 2167697 |
| User-Defined ID: | Q #59 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of the effect that a loss/ malfunction of the NUCLEAR BOILER INSTs will have on NSSSS |
| 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** | 216000 K3.02 4.0 |
| **KA Statement** | Nuclear Boiler Instrumentation<br>Knowledge of the effect that a loss or malfunction of the NUCLEAR BOILER INSTRUMENTATION will have on following:<br>PCIS/NSSSS. |
| **Cognitive level** | High |
| **Safety Function** | 7 – Instrumentation |
| **10 CFR 55** | 41.7 / 45.4 |
| **Technical Reference with Revision No:** | GP-8.1 U/2<br>M-0042 sh 4<br>U2 Tech Spec 3.3.2 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0072.7D |

**60** **ID: 2168696** **Points: 1.00**

The following drywell unit cooler fans are in "RUN" and operating on Unit 2:

- 2A1V212
- 2B1V212
- 2C1V212
- 2D1V212
- 2E1V212
- 2F1V212
- 2G1V212
- 2H1V212

All other drywell unit cooler fan switches are in "AUTO".

The D214-R-G MCC feeder breaker trips OPEN.

WHICH ONE of the following identifies the number of running Unit 2 Drywell Unit Cooler fans two (2) minutes later?

A. Four (4)

B. Six (6)

C. Eight (8)

D. Twelve (12)

Answer: C

**Answer Explanation**

There are 8 Unit Coolers each having 2 Fans (for a total of 16 fans). Each of the 4 safeguard divisions of electrical power supplies 4 unit cooler fans. The D21 bus (via D214-R-G) powers one fan for each of the following coolers: A, C, E, and G (for a total of 4 fans). There are normally 8 fans running, one for each of the 8 unit coolers, with their switches in RUN. The other 8 fans are aligned with their switches in AUTO

On Unit 2, a low flow condition on a unit cooler, results in the second unit cooler fan starting after a 55 second time delay if that second fan is in AUTO.

A 2 minute delay is given in the stem of the question. This is sufficient time for the 4 fans in AUTO associated with the 4 fans that lost power to start on the low flow condition. **Therefore, a total of 8 fans will be running. Four of the running fans will be in RUN and four will be in AUTO.**

Power supplies:

| D21 BUS Division 1 | D22 BUS Division 2 | D23 BUS Division 3 | | D24 BUS Division 4 | |
|---|---|---|---|---|---|
| D214-R-G | D224-R-G | D234-R-E | D234-R-H | D244-R-H | D244-R-E |
| 2A1V212 | 2B1V212 | 2A2V212 | 2C2V212 | 2D2V212 | 2B2V212 |
| 2C1V212 | 2D1V212 | 2E2V212 | 2G2V212 | 2F2V212 | 2H2V212 |
| 2E1V212 | 2F1V212 | | | | |
| 2G1V212 | 2H1V212 | | | | |

| | |
|---|---|
| **ANSWER (C)** | **8. Correct.**<br>As described above. |
| **DISTRACTOR (A)** | **4. Wrong**<br>A candidate may pick this answer assume that the low flow time delay has not yet been met. Thus only 4 fans will be running. |
| **DISTRACTOR (B)** | **6. Wrong.**<br>A candidate may pick this answer if they believe that there were originally 2 fans running on each of the 4 divisions, and that the low flow time delay has not yet been met. |
| **DISTRACTOR (D)** | **12. Wrong.**<br>A candidate may choose this if they know the divisional power supplies for the running fans (Divisions 1 and 2) but they think that on the low flow condition all the fans in AUTO will start automatically. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 60 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 |
| | |
| System ID: | 2168696 |
| User-Defined ID: | Q #60 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Knowledge of electrical power supplies to the following: Drywell cooling fans |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 2 |
| **KA # and Rating** | 223001 K2.09 2.7 |
| **KA Statement** | Primary Containment System and Auxiliaries Knowledge of electrical power supplies to the following: Drywell cooling fans: Plant-Specific |
| **Cognitive level** | LOW |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | E-0476 sheet 1 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | BANK (229677) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0060A.5F LGSOPS0077.LO4, 6 |

**61** **ID: 2200046** **Points: 1.00**

During a routine plant startup with the main generator synchronized to the grid, you observe that the difference between Reactor pressure and Pressure Averaging Manifold (PAM) pressure on DEHC is becoming larger as power ascends.

WHICH ONE of the following is correct regarding these observations?

This condition is…

A. NOT expected because DEHC controls reactor pressure to maintain it within 31 psig of PAM pressure.

B. NOT expected because DEHC controls PAM pressure to maintain it within 31 psig of reactor pressure.

C. Expected because DEHC controls reactor pressure to maintain it within a 31 psig regulation band and the lower PAM pressure results from main steam line headloss.

D. Expected because DEHC controls PAM pressure to maintain it within a 31 psig regulation band, and reactor pressure rises with the regulation band and main steam line headloss.

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **Expected because DEHC controls PAM pressure to maintain it within a 31 psig regulation band, and reactor pressure rises with the regulation band and main steam line headloss; Correct:** The 31 psig regulation band is associated with the change in Pressure Averaging Manifold (PAM) pressure as steam line flow increases. PAM pressure rises from 955 to 986 psig at a 3.25% steam flow per 1 psi rise. In other words, a 1 psi pressure error increase causes the control valves to open enough to pass 3.25% more steam flow. Reactor pressure rises from 955 to 1045 psig. Reactor pressure rises non-linearly to a higher value due to increased differential pressure caused by MSL headloss as steam line flow increases. |
| **DISTRACTOR (A)** | **NOT expected because DEHC controls reactor pressure to maintain it within 31 psig of PAM pressure; Wrong:** Plausible if the applicant does not understand or confuses the PAM pressure versus reactor pressure relationship. EHC senses PAM pressure to maintain it in a 31 psig regulation band up to full power. The 31 psig regulation band is not associated with reactor pressure |
| **DISTRACTOR (B)** | **NOT expected because DEHC controls PAM pressure to maintain it within 31 psig of reactor pressure; Wrong:** Plausible if the applicant does not understand or confuses the PAM pressure versus reactor pressure relationship. The 31 psig regulation band is associated with the change in PAM pressure as steam line flow increases. PAM pressure is not maintained within 31 psig of reactor pressure as is evidenced by the values of PAM pressure (986 psig) and reactor pressure (1045 psig) at 100% steam flow |
| **DISTRACTOR (C)** | **Expected because DEHC controls reactor pressure to maintain it within a 31 psig regulation band and the lower PAM pressure results from main steam line headloss; Wrong:** Plausible if the applicant incorrectly believes that DEHC controls Rx pressure and does not understand or confuses the PAM pressure versus reactor pressure relationship. DEHC senses PAM pressure and maintains it in a 31 psig regulation band, not reactor pressure. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 61 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 |
| | |
| System ID: | 2200046 |
| User-Defined ID: | Q #61 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | DEHC - PAMS Pressure Vs. RPV Pressure |
| Num Field 1: | LM |
| Num Field 2: | RO-MEMORY |
| 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** | 241000 K5.04 3.3 |
| **KA Statement** | Reactor/Turbine Pressure Regulating<br>Knowledge of the operational implications of the following concepts as they apply to REACTOR/TURBINE PRESSURE REGULATING SYSTEM: Turbine inlet pressure vs. reactor pressure. |
| **Cognitive level** | Low |
| **Safety Function** | 3 - Reactor Pressure Control |
| **10 CFR 55** | 41.5 / 45.3 |
| **Technical Reference with Revision No:** | LGSOPS0031B |
| **Question History: (i.e. LGS NRC-05)** | 2012 NRC Q#61 |
| **Question Type: (New, Bank, Modified)** | BANK 1098609 |
| **Revision History:** | |
| **Training Objective** | LGSOPS0031.1A, 1B |

**62** **ID: 2167759** **Points: 1.00**

Unit 2 conditions:

- Reactor power = 38%
- A 2A and 2B RRP are running at 60% speed
- GENERATOR LOAD (amps) = 11,000 amps (35%)
- Load Set is at 105%.

The following occurs:

- '2A' Stator Cooling Water Pump trips (breaker fault).
- '2B' Stator Cooling Water Pump will not start.

12 seconds after the '2A' Stator Cooling Water pump trips, WHAT is the expected plant response (if any)?

A. 2A RRP running at 60% speed, Load Set is 105%

B. 2A RRP running at 60% speed, Load Set is running back

C. 2A RRP running at 42% speed, Load set is 105%

D. 2A RRP running at 42% speed, Load set is running back

Answer: B

**Answer Explanation**

The SCW runback is designed to reduce generator load to the "no cooling setpoint" of 21.4% or 7469 amps in 3 1/2 minutes. In order to ensure the runback is working properly the circuitry has two checkpoints. One checkpoint at 75% load (26,173 amps) and 2 minutes and another at 21.4% load (7469 amps) in 3 1/2 minutes. If generator load is not reduced below the checkpoint values at the given time then the turbine will be tripped to unload the generator.

RRP runbacks only occur is FW flow is >6.7 mlbm/hr after a 9 sec (A) and 18 sec.(B) time delay.

| | |
|---|---|
| **ANSWER (B)** | **2A RRP running at 60% speed, Load Set is running back; Correct:** With power below 6.7 mlbm/hr feedwater flow, the RRPs will not runback and will remain at 60%. At 100% Rx power Feed flow is 15.3mlbm/hr. 6.7/15.3 = 43.7% power so Rx power of 38% means a feed flow of ~5.8 mlbm/hr. Therefore RRPs will not runback. Load set will runback as long as Generator Amps are >7469 A. |
| **DISTRACTOR (A)** | **2A RRP running at 60% speed, Load Set is 105%; Wrong:** Plausible to the candidate who recalls that FW flow must be >6.7 mlbm/hr for a runback to occur and who concludes that load set will not runback if FW flow is less than 6.7 mlbm/hr. , . |
| **DISTRACTOR (C)** | **2A RRP running at 42% speed, Load set is 105%; Wrong:** Plausible to the candidate who recalls that, 9 seconds after a Loss of stator cooling, the A RRP will runback but does not recognize that at 38% power FW flow is < 6.7 mlbm/hr and who believes that load set will not runback until both RRPs runback which would occur at 18 seconds if power were higher. |
| **DISTRACTOR (D)** | **2A RRP running at 42% speed, Load set is running back; Wrong:** Plausible to the candidate who recalls that, 9 seconds after a Loss of stator cooling, the A RRP will runback but does not recognize that at 38% power FW flow is < 6.7 mlbm/hr. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167759 |
| User-Defined ID: | Q #62 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Effect a loss/malfunction of SWC has on Main Generator |
| 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** | 2 |
| **KA # and Rating** | 245000 K6.05 2.9 |
| **KA Statement** | Main Turbine Generator/Auxiliary Knowledge of the effect that a loss or malfunction of the following will have on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS: Stator water cooling. |
| **Cognitive level** | HIGH |
| **Safety Function** | 4 - Heat Removal From Reactor Core |
| **10 CFR 55** | 41.7 / 45.7 |
| **Technical Reference with Revision No:** | ON-114 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0033.3A |

**63** **ID: 2167856** **Points: 1.00**

Unit 1 Conditions:

- Reactor Power = 100% steady state operations
- Unit 1 Hotwell level is 46 inches and steady.


WHICH ONE of the following describes:
(1) The reason for the CURRENT Condensate Fine Makeup and Reject Valve positions?
(2) how the controller signal demand would change on a trip of the "1A" Condensate Pump?

| | (1) | (2) |
|---|---|---|
| A. | Fine Reject valve is gagged open. | Full Reject |
| B. | Fine Reject valve is gagged open. | Full Makeup |
| C. | Fine Makeup valve is gagged open. | Full Reject |
| D. | Fine Makeup valve is gagged open. | Full Makeup |

Answer: A

**Answer Explanation**

The fine control valve is electronically gagged to maintain a constant reject flow rate of 200 gpm.
Both reject valves will close completely:

- Loss of *0-Y106 (loss of valve control power.)
- Loss of instrument air to the valve actuator
- High CST Level
- Low Condensate header pressure.

This constant reject is designed to provide the following loads with the cleanest, lowest oxygen content condensate available.
1) CRD pump suction
2) Condensate pump seal water
3) SJAE and SPE loop seals
4) Mechanical vacuum pump seal water
5) Condenser vacuum breaker seal water

The picture shows the fine reject valve partially open via the top set of dual red/green lights. This show indication of the electronic gagging of the fine reject valve. The bottom set of indicating light show the fine make-up valve also in the mid-position. The Fine controller output signal is sending an open signal to the fine make up valve to restore the 200 gpm lost through the reject line.

When the Condensate pump trips a 42% ASD runback will occur. This will cause an immediate reduction in reactor power due to core voiding. The reactor feed system will react faster than the EHC system due to the rise in RPV level as a result of the core voiding. Feed flow will be reduced. A steam flow feed flow mismatch occurs with steam flow being larger. Hotwell level will rise as more steam is condensed than the feed system needs to maintain RPV level. In response to the rising hotwell level, the condensate fine reject valve controller signal will go to full reject and the fine reject valve will open fully to maintain hotwell level at its 46 inch setpoint.

| | |
|---|---|
| **ANSWER (A)** | **Fine Reject valve is gagged open, Full Reject. Correct.**<br>As described above. |
| **DISTRACTOR (B)** | **Fine Reject valve is gagged open, Full Makeup. Wrong.**<br>The candidate does not recognize the impact that the transient will have on the condensate system, and uses the current condition of the controller output to derive an answer. |
| **DISTRACTOR (C)** | **Fine Makeup valve is gagged open, Full Reject. Wrong.**<br>Plausible to that does not recall which valve is gagged open and looks at the current controller signal position., but recognizes what happen to the condensate system in response to the transient. |
| **DISTRACTOR (D)** | **Fine Makeup valve is gagged open, Full Makeup. Wrong.**<br>Plausible to that does not recall which valve is gagged open and looks at the current controller signal position and uses the current condition of the controller output to derive an answer for the transient response |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167856 |
| User-Defined ID: | Q #63 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Ability to manually operate and/or monitor in the control room: Hotwell level controls. |
| Num Field 1: | LM |
| Num Field 2: | RO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | Embedded picture - Hotwell Level Controller. |
| **K/A Justification** | N/A |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 2 |
| **Group** | 2 |
| **KA # and Rating** | 256000 A4.03 3.2 |
| **KA Statement** | Condensate<br>Ability to manually operate and/or monitor in the control room: Hotwell level controls. |
| **Cognitive level** | HIGH |
| **Safety Function** | 2 - Reactor Water Inventory Control |
| **10 CFR 55** | 41.7 / 45.5 to 45.8 |
| **Technical Reference with Revision No:** | ARC-MCR-104 D-2 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS0005.3B |

**64** **ID: 2167857** **Points: 1.00**

Unit 1 is operating at 100% power.

A small single pin fuel failure occurs causing a doubling of release rates.

WHICH ONE of the following describes:

(1) The radiation monitoring system response?
(2) Procedure which must be implemented?

A. (1) A rise in Drywell Post LOCA radiation and Air Ejector Offgas Discharge Hi Radiation Alarm
(2) T-103 SECONDARY CONTAINMENT CONTROL

B. (1) A rise in Drywell Post LOCA radiation and Air Ejector Offgas Discharge Hi Radiation Alarm
(2) ON-102 AIR EJECTOR DISCHARGE OR MAIN STEAM LINE HIGH RADIATION

C. (1) Air Ejector Offgas Discharge Hi Radiation Alarm ONLY
(2) T-103 SECONDARY CONTAINMENT CONTROL

D. (1) Air Ejector Offgas Discharge Hi Radiation Alarm ONLY
(2) ON-102 AIR EJECTOR DISCHARGE OR MAIN STEAM LINE HIGH RADIATION

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **(1) Air Ejector Offgas Discharge Hi Radiation Alarm Only, (2) ON-102 AIR EJECTOR DISCHARGE OR MAIN STEAM LINE HIGH RADIATION; CORRECT:** A small fuel failure that causes release rates to rise will cause Air Ejector Offgas Discharge radiation to rise. With a doubling of air ejector rad, the Air Ejector Offgas monitor will alarm. The normal setpoint is 1.5X the background rad levels. A.E. Alarm 109-G2 is an entry into ON-102 |
| **DISTRACTOR (A)** | **(1) A rise in Drywell Post LOCA radiation and Air Ejector Offgas Discharge Hi Radiation Alarm, (2) T-103 SECONDARY CONTAINMENT CONTROL; Wrong:** Plausible misconception that a minor fuel failure would cause a rise in DW rad and plausible because MSL high rad is a T-103 entry. Drywell post LOCA radiation will not significantly rise due to small fuel failure. The small amount of gas released in the fuel would rapidly exit through the steam and be measured in the steam lines or offgas system. Post LOCA rad monitors are not sensitive to small gas releases at power. T-103 would not be entered unless Rad levels exceeded the MNO values for the MSLs of 1.5X NFPB. |
| **DISTRACTOR (B)** | **(1) A rise in Drywell Post LOCA radiation and Air Ejector Offgas Discharge Hi Radiation Alarm, (2) ON-102 AIR EJECTOR DISCHARGE OR MAIN STEAM LINE HIGH RADIATION; Wrong:** Plausible misconception that a fuel failure would cause a rise in DW rad. Drywell post LOCA radiation will not significantly rise due to small fuel failure. The small amount of gas released in the fuel would rapidly exit through the steam and be measured in the steam lines or offgas system. Post LOCA rad monitors are not sensitive to small gas releases at power. |
| **DISTRACTOR (C)** | **(1) Air Ejector Offgas Discharge Hi Radiation Alarm Only, (2) T-103 SECONDARY CONTAINMENT CONTROL; Wrong:** Plausible because MSL High Rad is a T-103 entry but not Air Ejector Rad. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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 |
| | |
| System ID: | 2167857 |
| User-Defined ID: | Q #64 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Predict plant response to Off Gas Rad Monitor Alarm |
| 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** | 2 | | |
| **KA # and Rating** | 271000 K1.02<br>3.1 | | |
| **KA Statement** | Offgas; Knowledge of the physical connections and/or cause-effect relationships between OFFGAS SYSTEM and the following: Process radiation monitoring system | | |
| **Cognitive level** | High | | |
| **Safety Function** | 9 - Radioactivity Release | | |
| **10 CFR 55** | 41.2 | | |
| **Technical Reference with Revision No:** | ON-102 | **Rev #:** | 3<br>1 |
| **Question History: (i.e. LGS NRC-05)** | | | |
| **Question Type: (New, Bank, Modified)** | Bank(2057821) | | |
| **Revision History:** | | | |
| **Training Objective** | | | |

**65** **ID: 2167855** **Points: 1.00**

Plant conditions are as follows:

- '0A' Control Enclosure Chiller is running
- '0B' Control Enclosure Chiller is in AUTO, and not running

Unit 1 RPV level drops to -150 inches

WHICH ONE of the following identifies the response of the Control Enclosure Chillers?

| | '0A' CHILLER | '0B' CHILLER |
|---|---|---|
| A. | Trips and restarts in 51 seconds | Remains off |
| B. | Trips and restarts in 51 seconds | Starts in 167 seconds |
| C. | Trips and restarts in 167 seconds | Remains off |
| D. | Trips and restarts in 167 seconds | Starts in 167 seconds |

Answer: D

**Answer Explanation**

**ATTACHMENT 2**
**LOCA LOAD SEQUENCING**

Response of 4KV system to a LOCA (All times in seconds)

| | |
|---|---|
| t = 0 | LOCA signal - Diesel starts |
| t = 0 | Load shed (Running RHR Pumps will not trip) |
| t = 0 | C & D RHR pumps start |
| t = 3 | L.C. Transformer Breaker closes |
| t = 5 | A & B RHR pumps start |
| t = 10 | A & C Core Spray pumps start |
| t = 15 | B & D Core Spray pumps start |
| t = 53 | ESW pumps start |
| t = 167 | Both Control Room chillers start (Unit 1LOCA signal Only) |
| t= 180 | RERS fan that is in AUTO starts |

Control Functions and Interlocks
Control Enclosure Chillers Operated from MCR panel 0C681 using handswitch HS90-026A(B)
Under normal conditions, one chiller is running, and the other is in standby

- A chiller will automatically start in the following conditions:

Example: If Control Room Supply fan 0BV116 is started, then the 'B' Chilled water pump starts immediately, and the 'B' CE Chiller starts after 51 seconds (when the program timer times out).

- If an associated Control Enclosure HVAC fan starts

Taking the chiller handswitch on 00C681 to stop will prevent the chiller from AUTO starting (Auto Lockout amber light illuminates on chiller indicator on 00C681) Total time delay is about 167 seconds.

After a LOCA signal, both chillers will receive a start signal, regardless of whether they were running before the LOCA signal. The LOCA start signal will be generated immediately after re-energization of the D13/D14 buses. The LOCA start signal energizes another relay with a 116 second time delay. When the 116 second time delay expires, the chiller program timer starts, and 51 seconds later, the chiller starts.

| | |
|---|---|
| **ANSWER (D)** | **Trips and restarts in 167 seconds, Trips and restarts in 167 seconds; Correct:** As discussed above, on a LOCA, both chillers start automatically 167 seconds following the LOCA signal unless prevented from starting. |
| **DISTRACTOR (A)** | **Trips and restarts in 51 seconds, Remains off; Wrong:** Plausible to the candidate who recalls the normal chiller sequence of starting 51 seconds following a pump start and assumes that the standby chiller will remain off. However, as noted above, the LOCA sequencing starts both chillers in 167 seconds |
| **DISTRACTOR (B)** | **Trips and restarts in 51 seconds, Starts in 167 seconds; Wrong:** Plausible to the candidate who recalls the normal start time of the chiller and forgets that a LOCA sequence adds the additional time and who recalls the standby chiller starts on a LOCA and assumes the standby chiller takes longer to minimize bus loading |
| **DISTRACTOR (C)** | **Trips and restarts in 167 seconds, Remains off; Wrong:** Plausible to the candidate who recalls the LOCA start sequence for the previously running chiller but does not recall that both chillers will run on a LOCA, not just the operating chiller. |

| **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 |
| | |
| System ID: | 2167855 |
| User-Defined ID: | Q #65 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Describe the response of the MCR Chiller on a LOCA signal |
| 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** | 2 |
| **KA # and Rating** | 290003 A3.01<br>3.3 |
| **KA Statement** | Control Room Ventilation: Ability to monitor automatic operations of the CONTROL ROOM HVAC including: Initiation/reconfiguration |
| **Cognitive level** | High |
| **Safety Function** | 9 - Radioactivity Release |
| **10 CFR 55** | 41.7 |
| **Technical Reference with Revision No:** | SE-10 Rev.065<br>E-463, E-164 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank (556213) |
| **Revision History:** | |
| **Training Objective** | LGSOPS0078.LO2 |

**66** **ID: 2167821** **Points: 1.00**

What is the frequency of panel walk downs in accordance with OP-AA-103-102, "Watch-Standing Practices"?

The Unit Operator (RO) is to perform a panel walk down of rad monitors and PPC alarms and indications a minimum of once _____1_____ and a paired walkdown with the Unit Supervisor (CRS) a minimum of once ____2_____.

| | 1 | 2 |
|---|---|---|
| A. | per hour | every 4 hours |
| B. | per hour | once per shift |
| C. | per two hours | every 4 hours |
| D. | per two hours | once per shift |

Answer: B

**Answer Explanation**

4.4. MCR Panel and PPC Monitoring

4.4.1. The Unit Reactor Operator shall:

1. **PERFORM** an hourly walk-down of the unit (including front and back panels, nuclear instrumentation drawers, radiation monitoring, computer displays, PPC alarms, PPC indications, etc.). The Assist Reactor Operator is expected to assist and share this responsibility.

   A. The hourly control room panel walk downs shall be **DOCUMENTED** in such a manner that evidence exists that it occurred.

   B. Critical parameters shall also be **RECORDED**.

4.4.2. The Unit Supervisor shall;

1. **PERFORM** a MCR panel / PPC walk-down as described above at least every four hours.

2. At least once per shift, the Unit Supervisor shall **PERFORM** a panel walk-down of the control panels / PPC with the Unit or Assist Reactor Operator.

| | |
|---|---|
| **ANSWER (B)** | **per hour, once per shift; Correct:** As noted in the text above, the RO must walkdown the entirety of the MCR including the back panels every hour and perform a paired walkdown with the CRS at least once per shift. |
| **DISTRACTOR (A)** | **per hour, every 4 hours; Wrong:** Plausible to the candidate who recalls the hourly requirement for the RO but confuses the requirement for the CRS to perform a walkdown every 4 hours by themselves with the requirement to perform the paired walkdown once per shift. |
| **DISTRACTOR (C)** | **per two hours, every 4 hours; Wrong:** Plausible to the candidate who fails to recall the requirement for hourly walkdowns and confuses the requirement for the CRS to perform a walkdown every 4 hours by themselves with the requirement to perform the paired walkdown once per shift.. |
| **DISTRACTOR (D)** | **per two hours, once per shift; Wrong:** Plausible to the candidate who fails to recall the requirement for hourly walkdowns. But does correctly recall the paired walkdown requirement. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167821 |
| User-Defined ID: | Q #66 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Conduct of OPS Panel Walkdowns |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.1.1<br>3.8 |
| **KA Statement** | Knowledge of conduct of operations requirements |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | OP-AA-103-102 Rev 020 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | |

**67** **ID: 2167818** **Points: 1.00**

The Unit Supervisor has directed you to perform S44.1.B, "UNISOLATE/STARTUP IDLE RWCU RECIRCULATION PUMP"

WHICH ONE of the following describes the MINIMUM electrical safety precautions required to install jumpers for the low flow trip bypass per step 4.4 in 10-C602 panel (125VDC)?

(Assume no PPE exemptions)

All metal removed, safety glasses worn and what additional PPE, if any, is required?

A. No additional PPE required

B. Electrical safety coat and rubber gloves

C. Long sleeve cotton shirt and rubber gloves

D. Electrical safety coat, rubber gloves and face shield

Answer: C

**Answer Explanation**

**ATTACHMENT 1**
**Electrical Safety PPE General Guidelines for Shock Protection**
**Page 1 of 1**

| Electrical Protective Clothing Source: NFPA 70E | Required Personal Protective Equipment (PPE) | |
|---|---|---|
| **Electrical Work Activity To Be Performed** | **Voltage Rated Gloves (See Note 1 for insulating sleeves)** | **Required Eye, Face & Head Protect** |
| Bench Work 50 – 240 Volts AC/DC Less than or = 20 amps | Class 00 for all work on exposed energized equipment. | Safety glasses or goggles. Hard hat and hearing protection, as req Safety and/or leather shoes, as required |
| Normal Work 50 – 240 Volts over 20 amps | Class 00 for all work on exposed energized equipment. | Safety glasses or goggles. Hard hat and hearing protection, as req Safety and/or leather shoes, as required |

Step 4.2.5:

4.2.5. Clothing

1. When working on exposed energized equipment, 50 volts or greater:
   A. Do **not** wear any clothing made solely or in combination of rayon, polyester, or acetate unless the clothing is labeled Flame Resistant.
   B. **WEAR** only clothing materials meeting or exceeding the requirements specified in Attachment 1 and Attachment 4, as applicable.

| | |
|---|---|
| **ANSWER (C)** | **Long sleeve cotton shirt and rubber gloves; Correct:** The table above is from SA-AA-129 Attachment 1 PPE guidelines. Since the job in question is to jumper 125VDC contacts, the table directs the use of safety glasses, hard had as required (N/A in the MCR) class 00 gloves based on voltage. |
| **DISTRACTOR (A)** | **No additional PPE required; Wrong:** Plausible to the candidate who does not recall the requirements for long sleeve shirts and gloves. |
| **DISTRACTOR (B)** | **Electrical safety coat and rubber gloves ; Wrong:** Plausible to the candidate who mistakenly believes that an electrical safety coat is required for this job. It is only required for higher voltage work with the potential for an ARC flash. |
| **DISTRACTOR (D)** | **Electrical safety coat, rubber gloves and face shield; Wrong:** Plausible to the candidate who mistakenly believes that a face shield is required for this job. Face Shields are required on higher voltage work |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 67 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 |
| System ID: | 2167818 |
| User-Defined ID: | Q #67 BANK |
| Cross Reference Number: | CLOSED |
| Topic: | Electrical Safety requirements |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.1.26 3.4 |
| **KA Statement** | Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen). |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | SA-AA-129 Rev.010 |
| **Question History: (i.e. LGS NRC-05)** | LGS 2016 #67 |
| **Question Type: (New, Bank, Modified)** | Bank (1153971) |
| **Revision History:** | |
| **Training Objective** | |

**68** **ID: 2201838** **Points: 1.00**

Who is responsible for approving a Temporary Change (TC) to a Surveillance test procedure for an instrument mislabeling?

A. Station qualified reviewer (SQR) only

B. Licensed Senior Reactor Operator only

C. Site functional area manager (SFAM) and Licensed Senior Reactor Operator

D. Station qualified reviewer and Licensed Senior Reactor Operator

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **Station qualified reviewer and Licensed Senior Reactor Operator; Correct:** Per AD-AA-101, rev. 29 step 4.2.2.1, Obtain approval signature from a station qualified reviewer and an approval signature from a qualified senior reactor operator. |
| **DISTRACTOR (A)** | **Station qualified reviewer (SQR) only; Wrong:** Plausible to the candidate who is not familiar with the procedure and assumes that only an SQR review is necessary. |
| **DISTRACTOR (C)** | **SFAM and Licensed Senior Reactor Operator; Wrong:** Plausible to the candidate who recalls that a Licensed SRO is required to approve a Temp. change and who recalls that the SFAM is responsible to evaluate the impact of site specific procedure changes against the fleet standard procedural requirements and assumes this includes approving Temp changes. It does not. |
| **DISTRACTOR (B)** | **Licensed Senior Reactor Operator only; Wrong:** Plausible to the candidate who not familiar with the procedure and assumes that only an SRO approval is required. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2201838 |
| User-Defined ID: | Q #68 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Temp Procedure Change approval |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.2.06<br>3.0 |
| **KA Statement** | Knowledge of the process for making changes to procedures |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | AD-AA-101 Rev.029 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | |

**69** **ID: 2167823** **Points: 1.00**

In accordance with OP-AA-109-101, "Personnel and Equipment Tagout Process"

A Tagout is prepared to perform emergent online maintenance of the 1A Condensate filter/demineralizer system. Only one valve protection is possible to the Condensate system.

How must the Tagout be designated?

A. Exceptional

B. Worker Safety

C. Special Condition

D. Condition Dependent

Answer: A

**Answer Explanation**

3.17. **Exceptional Tagout:** A clearance that requires workers to understand, mitigate and accept the risks (compliant to 29 CFR 1910.269(d)(6)(v) through 29 CFR 1910.269(d)(6)(vii)) associated with:

- A tagout that does **not** provide complete conventional isolation and removal of hazardous energy for the work to be performed

OR

**ATTACHMENT 2**

**Examples of Exceptional Tagouts**

**Page 1 of 1**

NOTE: This is not an all-inclusive list. It is incumbent upon the tagout preparer and approver to determine if the tagout is exceptional.

1. All required isolation points **cannot** be isolated.
2. Use of an MOV as a boundary isolation point when the hand wheel is inaccessible to hang a Tag.
3. Use of a control switch as the sole electrical isolation point for personnel or equipment protection.
4. Use of inaccessible valve hand wheels that **cannot** be physically verified closed or Tag **cannot** be attached.
5. Lack of dual valve isolation WITH a vent or drain path when isolating >500 psig or >200°F, or involving noxious chemicals

| | |
|---|---|
| **ANSWER (A)** | **Exceptional; Correct:** From OP-AA-109-101 above, an exceptional tagout does not offer complete conventional zone of protection. The example number 5 above is for lack of dual valve isolation with >500 psig system. Condensate, downstream of the Cond. pumps has a pressure of >500 psig at 100% power and higher at low power. |
| **DISTRACTOR (B)** | **Worker Safety; Wrong:** Plausible to the candidate who is less familiar with the process and recalls that Worker Safety Tagging allows workers to apply Tags and Locks close to their work location and therefore monitor it closer. Not appropriate in this case as single valve protection makes this more urgently important for control. |
| **DISTRACTOR (C)** | **Special Condition; Wrong:** Plausible to the candidate who recalls that SCT allows the worker to manipulate components essential to their work. Not appropriate in this case. |
| **DISTRACTOR (D)** | **Condition Dependent; Wrong:** Plausible to the candidate who believes that this tagging would provide some protection for their work. It would not in this case as conditions are hazardous to the unprotected worker. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167823 |
| User-Defined ID: | Q #69 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Tagging Procedures Exceptional Clearance |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.2.13<br>4.1 |
| **KA Statement** | Knowledge of tagging and clearance procedures |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | OP-AA-109-101<br>Rev.016 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | |

**70** **ID: 2170263** **Points: 1.00**

LGS Unit 2 is shutdown for refueling with RPV cooldown in progress.

WHICH ONE of the following events describes the **earliest** point when Technical Specification OPCON 5 is entered?

A. Mode Switch in Shutdown AND RPV vessel head removed

B. Mode Switch in Shutdown AND one RPV vessel head bolt is less than fully tensioned

C. Mode Switch in Refuel AND RPV coolant temperature ≤200 degrees

D. Mode Switch in Refuel AND all RPV vessel head bolts are less than fully tensioned

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **Mode Switch in Shutdown AND one RPV vessel head bolt is less than fully tensioned; Correct:** Technical Specifications definitions Table 1.2 defines OPCON 5 as Mode switch position in SHUTDOWN or REFUEL with vessel head bolts less than fully tensioned. |
| **DISTRACTOR (A)** | **Mode Switch in Shutdown AND RPV vessel head removed; Wrong:** Plausible to the candidate who recalls that this condition would be Mode 5 however it is not the earliest point when that condition is met. |
| **DISTRACTOR (C)** | **Mode Switch in Refuel AND RPV coolant temperature ≤200 degrees; Wrong:** Plausible to the candidate who recalls that temperature must be cooled down to less than 200°F to refuel the vessel and preferable much less. OPCON 5 is dependent on at least one head bolt being less than fully tensioned. |
| **DISTRACTOR (D)** | **Mode Switch in Refuel AND all RPV vessel head bolts are less than fully tensioned; Wrong:** Plausible to the candidate who recalls that this condition would be Mode 5 however it is not the earliest point when that condition is met. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 70 Info** | |
|---|---|
| Question Type: | Multiple Choice |
| Status: | Active |
| Always select on test? | No |
| Authorized for practice? | No |
| Points: | 1.00 |
| Time to Complete: | 6 |
| Difficulty: | 4.00 |
| | |
| System ID: | 2170263 |
| User-Defined ID: | Q #70 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Mode of Operation |
| 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** | |
| **KA # and Rating** | 2.2.35 3.6 |
| **KA Statement** | Ability to determine Technical Specification Mode of Operation |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | LGS Tech Specs Def. 1.0 Rev. 149 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank(980302) |
| **Revision History:** | |
| **Training Objective** | |

K/A Equipment Control / G2.2.35
2.2.35 Ability to determine Technical Specification Mode of Operation
| (CFR: 41.5/ 43.2 / 45.2)
IMPORTANCE RO 3.6 SRO 4.5

**71** **ID: 2167815** **Points: 1.00**

During a declared emergency, an Equipment Operator (EO) must enter an area of the Unit 1 Reactor Enclosure to locate and isolate a leak.

- The general area radiation level is 3 Rem/hour.

The EO, age 38, has the following radiation history:

- 1760 mRem cumulative exposure for the current year (TEDE)
- 19 Rem lifetime exposure to this date (TEDE)
- No dose extensions have been obtained
- NRC Form 4 completed and on file

The EO has been given 30 minutes to complete the task.

WHICH ONE of the following radiation exposure limits, if any, would be exceeded if the EO performs this task?

A. No exposure limits would be exceeded

B. Administrative Dose Control Level

C. Administrative Dose Control Level AND NRC Exposure Limit

D. Administrative Dose Control Level, AND NRC Exposure Limit, AND Emergency Exposure Limit

Answer: B

**Answer Explanation**

3 Rem = 3000 mRem
3000 mRem X .5 = 1500 mRem
1500 mRem + 1760 mRem = 3260 mRem
3260 mRem exceeds 2000 mRem TEDE Admin Dose Control Level.

| | |
|---|---|
| **ANSWER (B)** | **Administrative Dose Control Level; Correct:** As noted in the calculation, the total dose to the individual for the year would be 3260 mrem. This is in excess of the Admin limit of 2000 mrem but less than the NRC limit. |
| **DISTRACTOR (A)** | **No exposure limits would be exceeded; Wrong:** Plausible to the candidate who calculates the dose received on this particular job as 1500 mrem but did not include the workers previous annual exposure to determine the workers total exposure for the year. |
| **DISTRACTOR (C)** | **Administrative Dose Control Level AND NRC Exposure Limit; Wrong:** Plausible to the candidate who miscalculated the total dose or added the workers lifetime exposure into the calculation. |
| **DISTRACTOR (D)** | **Administrative Dose Control Level, AND NRC Exposure Limit, AND Emergency Exposure Limit; Wrong:** Plausible to the candidate who miscalculated the total dose and included the workers lifetime exposure while assuming that a dose in excess of 10 Rem was an emergency exposure. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 71 Info** | |
|---|---|
| Question Type: | Multiple Choice |
| Status: | Active |
| Always select on test? | No |
| Authorized for practice? | No |
| Points: | 1.00 |
| Time to Complete: | 5 |
| Difficulty: | 0.00 |
| | |
| System ID: | 2167815 |
| User-Defined ID: | Q #71 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Dose Admin Limit |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.3.4<br>3.2 |
| **KA Statement** | Knowledge of radiation exposure limits under normal or emergency conditions |
| **Cognitive level** | High |
| **Safety Function** | |
| **10 CFR 55** | 41.12 |
| **Technical Reference with Revision No:** | RP-AA-203<br>Rev.006 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank (738395) |
| **Revision History:** | |
| **Training Objective** | |

**72** **ID: 2167795** **Points: 1.00**

Unit 2 plant conditions are as follows:

- Reactor power is 100%
- TIPS are in operation per S74.0.A, “Operation of Traversing In-Core Probe System,” to support APRM calibrations
- The Reactor Enclosure Equipment Operator reports that workers are on the TIP Room roof.

WHICH ONE of the following shall be immediately performed?

A. Direct Security to enter area and evacuate workers

B. Immediately withdraw TIPS into shields, Inform Shift Supervision

C. Direct Equipment Operator to enter posted area and evacuate workers

D. Stop operation of TIP mechanisms, Inform Shift Supervision

Answer: D

**Answer Explanation**

With the conditions stated, either the required postings and Announcements per S74.0.A, Steps 4.2 and 4.3, have not been completed, or personnel have violated a posted radiation boundary. S74.0.A, Step 4.3 PA announcement, is as follows:

- "Unit 1(2) TIPS will be (are) in operation. Please stay clear of the TIP room, the TIP room roof, and affected areas."

Action to stop operation of the TIP mechanisms prevents moving the irradiated TIP detectors from their shields and from In-Core through the area that would result in a higher dose to the workers on the TIP Room roof. Area postings and periodic PA announcements are consistent with RP-LG-301-2001, Attachment 9, "TIP Run Coverage and Posting," and RP-AB-460, "TIP Area Access Radiological Controls

| | |
|---|---|
| **ANSWER (D)** | **Stop operation of TIP mechanisms, Inform Shift Supervision; Correct:** As noted above, when personnel are discovered in a compromised location, Stopping TIP movements is the best action to prevent exposing them to the TIP probe radiation as it exits the core prior to reaching the shield. |
| **DISTRACTOR (A)** | **Direct Security to enter area and evacuate workers; Wrong:** Plausible if the candidate who does not recognize that this action would violate a posted Radiation Boundary and lead to potential uncontrolled dose of the Security personnel . |
| **DISTRACTOR (B)** | **Immediately withdraw TIPS into shields, Inform Shift Supervision; Wrong:** Plausible if the applicant believes that moving the irradiated TIP detector from In-Core through the TIP Room to the chamber shields would not raise dose rate in the vicinity of the workers on the TIP Room roof. This is incorrect. |
| **DISTRACTOR (C)** | **Direct Equipment Operator to enter posted area and evacuate workers; Wrong:** Plausible if the applicant does not recognize that this action would violate a posted Radiation Boundary and lead to potential uncontrolled dose to additional operators |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 72 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 |
| | |
| System ID: | 2167795 |
| User-Defined ID: | Q #72 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | TIPS Rad Issues |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | This is a Tier 3 question as described in 1021 Rev. While the situation used for the setup describes work near the TIP room, the question tests generic plant requirements for Radiation hazards. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | RO |
| **Tier** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.3.14 3.4 |
| **KA Statement** | Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.12 |
| **Technical Reference with Revision No:** | S74.0.A Rev. 061<br>RP-AA-460 Rev. 038<br>RP-LG-301-2001 Rev.028 |
| **Question History: (i.e. LGS NRC-05)** | LGS NRC 2012 #72 |
| **Question Type: (New, Bank, Modified)** | Bank |
| **Revision History:** | |
| **Training Objective** | |

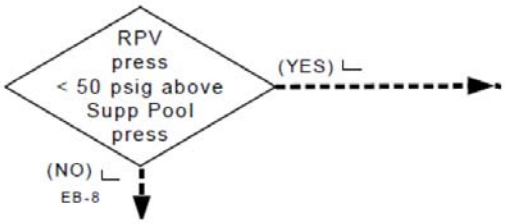
**73** **ID: 2167714** **Points: 1.00**

Which one of the following conditions describes when the Reactor is in a DEPRESSURIZED state per T-112 requirements?

| | RPV Pressure | Suppression Pool Pressure |
|---|---|---|
| A. | 110 psig | 15 psig |
| B. | 95 psig | 20 psig |
| C. | 74 psig | 32 psig |
| D. | 65 psig | 10 psig |

Answer: C

**Answer Explanation**




DISCUSSION

Step EB-8 is a decision diamond that has operators evaluate the current status of RPV-to-suppression pool differential pressure. This information must be known to determine whether the use of alternate RPV depressurization systems will be required to depressurize and maintain the RPV in a "depressurized" state.

"Depressurized" as used in T-112 is an RPV to suppression chamber differential pressure less than the Decay Heat Removal Pressure (DHRP) (50 psig). The DHRP is used as the basis for the depressurized state since:

- DHRP, by definition, is equal to or greater than the lowest pressure at which an SRV will fully open and remain fully open when its control switch is placed in the "OPEN" position,

AND

- below this differential, the rate of energy addition to the primary containment will be within the capacity of the primary containment vent path.

| | |
|---|---|
| **ANSWER (C)** | **74 psig, 32 psig; Correct:** As noted above in the basis, Rx is depressurized when PSID between the Reactor and the Suppression Pool is < 50 psid. |
| **DISTRACTOR (A)** | **110 psig, 15 psig; Wrong:** Plausible to the candidate who recalls that when using RCIC for injection in T-111, if Emergency depressurization is directed, pressure is lowered to 150-300 psig. Therefore, 110 psig could be assumed to be depressurized. This however does not meet the intent of the T-112 trip step to get reactor energy as low as possible. The direction in T-111 is an interim step to allow for continued injection as long as possible. |
| **DISTRACTOR (B)** | **95 psig, 20 psig; Wrong:** Plausible to the candidate who assumes that <100 psig in the vessel is depressurized based on simulator experience where pressure less than 100 psig is when operators are told to prepare for SRV closure and level perturbations. |
| **DISTRACTOR (D)** | **65 psig, 10 psig Wrong:** Plausible to the candidate who recalls the STOP sign in T-112 that allows the Trip execution to continue when Reactor pressure is less than 75 psig. However, there is still 55 psid and the SRVs will still remain open. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167714 |
| User-Defined ID: | Q #73 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | EOP Depressurized |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G2.4.17<br>3.9 |
| **KA Statement** | Knowledge of EOP terms and definitions. |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | |
| **Question History: (i.e. LGS NRC-05)** | T-117 Rev 023<br>TSG 3.10 Rev.002 |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | New |
| **Training Objective** | |

**74** **ID: 2167675** **Points: 1.00**

Unit 1 is at 100% power
Unit 2 is shut down for refueling in OPCON 5

Which ONE of the choices below completes the following statements concerning fire brigade staffing?

1. IAW , OP-LG-101-111, Shift Staffing Requirements, a MINIMUM of _____ Fire Brigade Members must be onsite to respond to a fire.

2. The outside operator, while performing normal duties, _____ be assigned as a member of the Fire Brigade

A. 1. 5
2. May

B. 1. 5
2. May Not

C. 1. 6
2. May

D. 1. 6
2. May Not

Answer: B

**Answer Explanation**

| | |
|---|---|
| **ANSWER (B)** | **1. 5, 2. May Not; Correct:** The number of Fire Brigade members is 5 per TS. 6.2.2 and per OP-LG-101-111, Shift Staffing Requirements. Per the OP-LG-101-111 procedure Att. 4 step 1, Fire Brigade member Shall not be assigned to routine activities outside the site protected area boundary. |
| **DISTRACTOR (A)** | **1. 5, 2. May; Wrong:** Plausible to the candidate who recalls 5 is the correct staffing number but assumes that the Outside operator may be on the fire brigade since they could be a fire safe shutdown operator. |
| **DISTRACTOR (C)** | **1. 6, 2. May; Wrong:** Plausible to the candidate who confuses the FSSD number which is 6 with the FB number of 5 and who assumes that the Outside operator may be on the fire brigade since they could be a fire safe shutdown operator. |
| **DISTRACTOR (D)** | **1. 6, 2. May Not; Wrong:** Plausible to the candidate who confuses the required number of FSSD members (6) with minimum fire Brigade staffing(5) |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167675 |
| User-Defined ID: | Q #74 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | Fire Protection Requirements |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G2.4.26 3.1 |
| **KA Statement** | Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage |
| **Cognitive level** | Low |
| **Safety Function** | 8 - Plant Services |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | OP-LG-101-111 Rev.008 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS1574.04A |

**75** **ID: 2167602** **Points: 1.00**

An ALERT Emergency Action Level has been declared.

The Technical Support Center and Emergency Operations Facility are NOT activated.

Per EP-MA-114-100, "Mid Atlantic State/Local Notifications", which one of the following communications methods is used to make State and Local Initial notifications if EONS system is NOT available?

A. NARS - Nuclear Accident Reporting System

B. ENS - Emergency Notification System

C. ERDS - Emergency Response Data System

D. EPDS - Emergency Preparedness Data System

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **NARS - Nuclear Accident Reporting System; Correct:** The normal system for making state and local notifications has recently been transferred to EONS which is a computerized system to directly transmit emergency declarations without a human interaction. The question stem states that EONS is not available. Therefore NARS is the backup method for state and local notifications. This is a manual system requiring the communicator to transmit the form and read it to the responding agencies. |
| **DISTRACTOR (B)** | **ENS; Wrong:** Plausible to the candidate who fails to recall the definition of ENS. Emergency Notification System (ENS), is a telecommunications network and worksheet used to transmit information to the Nuclear Regulatory Commission (NRC). |
| **DISTRACTOR (C)** | **ERDS - Emergency Response Data System; Wrong**: Plausible to the candidate who fails to recall the function of ERDS. This is a computer system to provide real time info to the NRC on plant status fed from LGS PPC. From EP-AA-110: *Emergency Response Data System (ERDS) is a direct near real-time electronic data link between the onsite computer system and the NRC Headquarters Operations Center that provides for the automated transmission of a limited data set of selected parameters* |
| **DISTRACTOR (D)** | **EPDS; Wrong;** Plausible to the candidate who fails to recall the function of EPDS. This is a computer system to provide real time info to the TSC and EOF on plant status fed from LGS PPC. From EP-AA-110:<br>*Emergency Preparedness Data System (EPDS) is an Mid-Atlantic emergency facility data system used to aid in assessing plant response and status during emergencies. EPDS is a computer based real-time data acquisition and display system, which acquires, stores and re-packages data from the Plant Monitoring System (PMS) and Radiological Monitoring System (RMS) for display in the Technical Support Center (TSC) at Limerick and Peach Bottom Stations and the common Emergency Operations Facility (EOF) at the Coatesville, Pennsylvania, Service Center* |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167602 |
| User-Defined ID: | Q #75 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | EP Communications Systems |
| Num Field 1: | LM |
| Num Field 2: | RO-LOW |
| 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** | 3 |
| **Group** | |
| **KA # and Rating** | G2.4.43<br>3.2 |
| **KA Statement** | Knowledge of emergency communication systems and techniques |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 41.10 |
| **Technical Reference with Revision No:** | EP-MA-114-100<br>Rev.027 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | EP |

**76** **ID: 2164016** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is operating at 90% power.

Multiple cell failures on the '2A' ASD results in the following Recirc indications:

- '2A' Recirc Loop Flow is 28 Mlbm/hr
- '2B' Recirc Loop Flow is 42 Mlbm/hr
- Core Flow is 70 Mlbm/hr

WHICH ONE of the following identifies (1) the HIGHEST '2B' Recirc flow value that will satisfy Tech Specs and (2) the Basis for the Tech Spec Recirc flow mismatch limitations? (Assume 'A' flows remain constant)

| | HIGHEST '2B' Recirc flow value that will satisfy Tech Specs | Basis for Tech Spec Recirc flow mismatch limitations |
|---|---|---|
| A. | 32.5 Mlbm/hr | Prevents undue stress on the vessel nozzles and bottom head region |
| B. | 32.5 Mlbm/hr | Ensure an adequate core flow coastdown from either recirc loop following a LOCA |
| C. | 37.5 Mlbm/hr | Prevents undue stress on the vessel nozzles and bottom head region |
| D. | 37.5 Mlbm/hr | Ensure an adequate core flow coastdown from either recirc loop following a LOCA |

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **37.5 Mlbm/hr, Ensure an adequate core flow coastdown from either recirc loop following a LOCA; Correct:** Refer to Tech Spec 3.4.1.3 action a, which states "Recirculation loop flow mismatch shall be maintained: **a.** Within 5% of each other with core flow greater than or equal to 70% of rated core flow, or **b**. within 10% of each other with core flow less than 70% of rated core flow. From the daily ST, ST-6-107-590-2, Note 1 on page 85, (Rev. 134) states "If core flow < 70%, THEN VERIFY DIFFERENCE ≤ 10 Mlbm/hr OR IF ≥ 70%, THEN VERIFY DIFFERENCE ≤ 5Mlbm/hr. Therefore, when 'B' Recirc flow is reduced to 37.5 Mlbm/hr, total core flow will be less than 70% and the 10 Mlbm/hr flow mismatch requirement will be met.<br><br>Tech Spec Bases for 3/4.4.1 states:<br>Recirculation pump speed mismatch limits are in compliance with the ECCS LOCA analysis design criteria for two recirculation loop operation. The limits will ensure an adequate core flow coastdown from either recirculation loop following a LOCA. In the case where the mismatch limits cannot be maintained during two loop operation, continued operation is permitted in a single recirculation loop mode. |
| **DISTRACTOR (A)** | **32.5 Mlbm/hr, Prevents undue stress on the vessel nozzles and bottom head region; Wrong:** Plausible to the candidate who incorrectly determines the requirement as 5% mismatch because they don't consider that when Loop B flow is reduced, the core flow will be less than 70% and therefore 10% mismatch applies and who recalls the basis for recirc loop temperature difference prior to a start of an idle recirc pump rather than flow mismatch |
| **DISTRACTOR (B)** | **32.5 Mlbm/hr, Ensure an adequate core flow cooldown from either recirc loop following a LOCA; Wrong:** Plausible to the candidate who incorrectly determines the requirement as 5% mismatch because they don't consider that when Loop B flow is reduced, the core flow will be less than 70% and therefore 10% mismatch applies |
| **DISTRACTOR (C)** | **37.5 Mlbm/hr, Prevents undue stress on the vessel nozzles and bottom head region; Wrong:** Plausible to the candidate who recalls the basis for recirc loop temperature difference prior to a start of an idle recirc pump rather than flow mismatch |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164016 |
| User-Defined ID: | Q #76 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | (SRO) Recall Tech Spec 3.4.1.3 SR requirements for Recirc Flow mismatch |
| Num Field 1: | LM |
| Num Field 2: | SRO - HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295001 G 2.2.25<br>4.2 |
| **KA Statement** | **Partial or Complete Loss of Forced Core Flow Circulation:** Knowledge of the bases in technical specifications for limiting conditions for operation and safety limits (SRO Only) |
| **Cognitive level** | High |
| **Safety Function** | 1 - Reactivity |
| **10 CFR 55** | 43.2 |
| **Technical Reference with Revision No:** | OT-112 Rev. 062<br>T.S. 3.4.1.3 Rev 186 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank |
| **Revision History:** | |
| **Training Objective** | LGSOPS1800.05B.01 |

**77** **ID: 2164203** **Points: 1.00**

************SRO ONLY************

Unit 2 is at 100% power.

An Instrument Air header in the Turbine Building ruptures, resulting in a complete loss of Instrument Air. A GP-4 Rapid Plant Shutdown has been performed and the following conditions now exist:

- All control rods are fully inserted
- MSIVs are closed
- RPV level is being maintained +12.5 inches to +54 inches with RCIC
- RPV pressure is being maintained 800-1000 psig with HPCI
- Drywell pressure is 0.58 psig and slowly rising
- Recirc pumps have been tripped

With the plant stabilized the CRS has transitioned to T-100, “Scram /Scram Recovery.”

WHICH ONE of the following actions describes the appropriate Operator response based on the above conditions?

A. Secure CRD flow to the RPV per S46.7.A, “Control Rod Drive Hydraulic System Operation Following Reactor Scram"

B. Vent the Drywell per OT-101, “High Drywell Pressure"

C. Maximize RPV bottom head drain flow through the Filter Demins per S44.1.J, “RWCU Hot Shutdown Operation"

D. Place RECW in service to cool the Drywell per S13.6.D, “RECW Operation With Loss Of Drywell Chilled Water"

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **Secure CRD flow to the RPV per S46.7.A, "Control Rod Drive Hydraulic System Operation Following Reactor Scram"; Correct:** Step RC/P-10 of T-100, directs alternative actions to prevent thermal stratification of coolant in the RPV on the basis of "NO" responses to RC/P-8 and RC/P-9 (no Recirc pumps running and the RWCU System not in service). On a Complete Loss of Instrument Air, RWCU will trip on low flow when the Filter Demin flow control valves fail closed. With both Recirc pumps tripped and RWCU unavailable, the required action, in accordance with Step RC/P-10, is to secure CRD pump flow to the RPV using S46.7.A. The CRD pumps are a source of cold water that could cause thermal stratification of coolant in the RPV. Since the CRD pumps are not needed for control rod insertion or RPV level control, CRD pump flow is secured. This action is also important from the standpoint that CRD charging water will continue to flow into the RPV through the "Inlet Scram Valves," even after the Scram is reset, because there is no air to close the valves. |
| **DISTRACTOR (B)** | **Vent the Drywell per OT-101, "High Drywell Pressure"; Wrong:** Plausible: Loss of Instrument Air results in a loss of the Drywell Chilled Water System (causes Drywell temperature and pressure to rise). Plausible if the applicant does not recall or is unfamiliar with the procedural guidance provided in the "ON-119 Attachment," which states that Containment cannot be vented with a Loss of Instrument Air. OT-101, "High Drywell Pressure," directs the use of HV-57-*17, "Drywell Purge To Equipment Compt Exh Outbd PCIV," to vent containment. This is an air-operated valve, the normal position of which is closed. On a Loss of Instrument Air, HV-57-*17 will remain in the closed "Fail Safe" position. |
| **DISTRACTOR (C)** | **Maximize RPV bottom head drain flow through the Filter Demins per S44.1.J, "RWCU Hot Shutdown Operation"; Wrong:** Plausible if the applicant does not recall that on a Complete Loss of Instrument Air, RWCU will trip on low flow when the Filter Demin flow control valves fail closed. Step RC/P-12 of T-100, directs maximization of RPV bottom head drain flow (per S44.1.J) assuming a "YES" response to RC/P-9 (RWCU System in service). |
| **DISTRACTOR (D)** | **Place RECW in service to cool the Drywell per S13.6.D, "RECW Operation With Loss Of Drywell Chilled Water"; Wrong:** Plausible, Loss of Instrument Air results in a loss of the Drywell Chilled Water System (causes Drywell temperature and pressure to rise). Plausible if the applicant does not understand that "RECW to Drywell Cooling Primary Containment Isolation Valves" HV87-*24a, *24B, *25A, and *25B are no longer automatic PCIVs that can be opened in OPCONs 1, 2, or 3 without violating primary containment integrity (TS 3.6.1.1). The RECW System provides backup cooling to the Drywell portion of the Drywell Chilled Water System (DCWS) during a LOOP or failure of the DCWS. Placing RECW in service to cool the Drywell per S13.6.D would be a viable option in OPCONs 4 and 5 only (stem conditions indicate that the Unit is in OPCON 3). |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 77 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 |
| | |
| System ID: | 2164203 |
| User-Defined ID: | Q #77 BANK PREVIOUS 17-1 |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO ONLY - ON-119 operation response to loss of IA |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295019 AA2.02 (3.6/3.7) |
| **KA Statement** | **Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:** Status of safety-related instrument air system loads (see AK2.1 – AK2.19) |
| **Cognitive level** | High |
| **Safety Function** | 8 Plant Service System |
| **10 CFR 55** | 43(b)(5) |
| **Technical Reference with Revision No:** | T-100 Rev. 019 |
| **Question History: (i.e. LGS NRC-05)** | NRC 2018 LGS NRC |
| **Question Type: (New, Bank, Modified)** | Bank 2061686 |
| **Revision History:** | |
| **Training Objective** | LGSOPS0015.07 |

**78** **ID: 2201840** **Points: 1.00**

**********SRO ONLY**********

The plant is in day 8 of a refueling outage

- Reactor coolant temperature is 105°F and stable
- Cavity water level is 494 inches
- Core shuffle is in progress

A spent fuel assembly has been dropped in the Spent Fuel Pool

Refuel Floor rad monitors read as follows:

- RIS29-M1-1K600 183 mR/hr up slow
- RIS30-M1-1K600 241 mR/hr up slow
- RIS31-M1-1K600 1,053 mR/hr up slow
- RIS32-M1-1K600 527 mR/hr up slow
- RIS33-M1-1K600 334 mR/hr up slow

The bridge operator reports that level in the pool has dropped approximately 1 inch and is lowering slowly

Given: ON-120, "Fuel Handling Problems"

Which one of the following describes the actions required and emergency plan action level threshold that should be declared?

| | ON-120 Action | EAL |
|---|---|---|
| A. | Initiate SGTS | RA2 |
| B. | Initiate SGTS | RU2 |
| C. | Evacuate the Fuel Floor | RA2 |
| D. | Evacuate the Fuel Floor | RU2 |

Answer: C

| **Answer Explanation** |
|---|
| |

| ALERT | UNUSUAL EVENT |
|---|---|
| **RA2** Significant lowering of water level above, or damage to, irradiated fuel. 1 2 3 4 5 D<br>**Emergency Action Level (EAL):**<br>1. Uncovery of irradiated fuel in the REFUELING PATHWAY.<br>OR<br>2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R2 Radiation Monitor reading **>1000 mR/hr.**<br>OR<br>3. Lowering of spent fuel pool level to **10.20 ft.** as indicated on LI-053-200A(B). | **RU2** Unplanned loss of water level above irradiated fuel. 1 2 3 4 5 D<br>**Emergency Action Level (EAL):**<br>1. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by:<br>• Refueling Cavity water level **< 484 inches.**<br>OR<br>• Spent Fuel Pool level **< 22 ft.** above seated irradiated fuel.<br>OR<br>• Indication or report of a drop in water level in the REFUELING PATHWAY.<br>**AND**<br>2. UNPLANNED Area Radiation Monitor reading rise on **ANY** radiation monitor in Table R2. |

| Table R2<br>Refuel Floor ARM's |
|---|
| • RIS29-M1-1(2)K600, Drywell Head Laydown<br>• RIS30-M1-1(2)K600, Dryer / Separator Area<br>• RIS31-M1-1(2)K600, Spent Fuel Pool<br>• RIS32-M1-1(2)K600, New Fuel storage Vault<br>• RIS33-M1-1(2)K600, Pool Plug Laydown |

| | |
|---|---|
| **ANSWER (C)** | **Evacuate the Fuel Floor, RA2; Correct:** To answer the question, the candidate should recognize that a dropped fuel bundle is an entry into ON-120. In ON-120, attachment 3 for a dropped bundle step 1.4 is to evacuate the fuel floor. RA2 is correct EAL as noted above with RIS31-M1-1K600 Rad monitor is reading 1,053 mR/hr, the threshold is met. |
| **DISTRACTOR (A)** | **Initiate SGTS, RA2; Wrong:** Plausible to the candidate who recalls that attachment 3 does direct the initiation of SGTS but only if Secondary containment is established. It is not per the stem conditions |
| **DISTRACTOR (B)** | **Initiate SGTS, RU2; Wrong:** Plausible to the candidate who recalls that attachment 3 does direct the initiation of SGTS but only if Secondary containment is established. It is not per the stem |

| | |
|---|---|
| | conditions. Also plausible that RU2 is correct because both thresholds are met for RU2 but it is not the highest EAL declaration which should be reported per EP-AA-1008 add. 3 section 1.2, page 1-5. RA2 is also met and is a higher classification |
| **DISTRACTOR (D)** | **Evacuate the Fuel Floor, RU2; Wrong:** Plausible that RU2 is correct because both thresholds are met for RU2 but it is not the highest EAL declaration which should be reported per EP-AA-1008 add. 3 section 1.2, page 1-5. RA2 is also met and is a higher classification |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2201840 |
| User-Defined ID: | Q #78 NEW |
| Cross Reference Number: | OPEN |
| | |
| Topic: | (SRO Only) Refueling Accident EOP entry |
| Num Field 1: | LM |
| Num Field 2: | SRO- HIGH |
| Text Field: | LO-ILT |

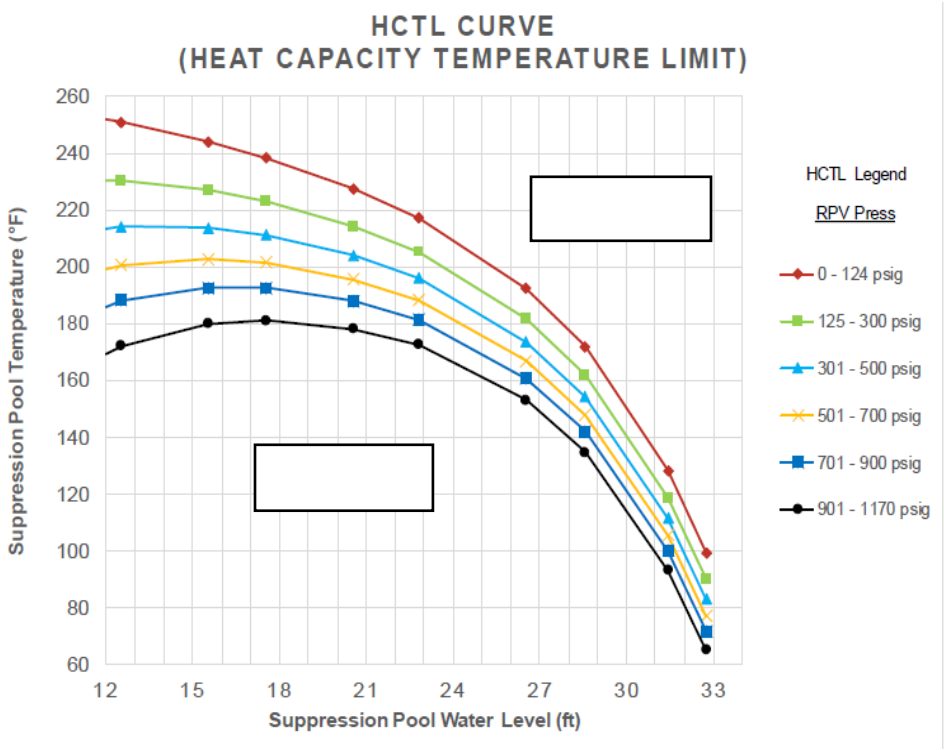
Comments:

| | |
|---|---|
| **References Provided** | EP-AA-1008 Add. 3, EAL Matrix page 2-15 Cold Matrix |
| **K/A Justification** | |
| **SRO-Only Justification** | Knowledge of Emergency Action Levels and selecting the correct EAL for the refueling emergency. |
| **Additional Information** | |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295023 AA2.05<br>4.6 |
| **KA Statement** | **Refueling Accidents: Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS :** Entry conditions of emergency plan |
| **Cognitive level** | High |
| **Safety Function** | 8 - Fuel Handling |
| **10 CFR 55** | 43.07 |
| **Technical Reference with Revision No:** | ON-120 Rev 031<br>EP-AA-1008 Add. 3 Rev 006 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | EAL training |

**79** **ID: 2164212** **Points: 1.00**

**********SRO ONLY**********




Plant conditions:

- An ATWS is in progress
- RPV level is being controlled with HPCI
- SLC injection line is broken
- Reactor power is 10%
- Reactor pressure is being controlled between 990 psig and 1096 psig with SRVs
- Suppression Pool level is 23'
- Suppression Pool temperature is 177° rising slowly

WHICH ONE of the following identifies the required action?

A. Lower Suppression Pool level to 21 ft. per T-102, Primary Containment Control

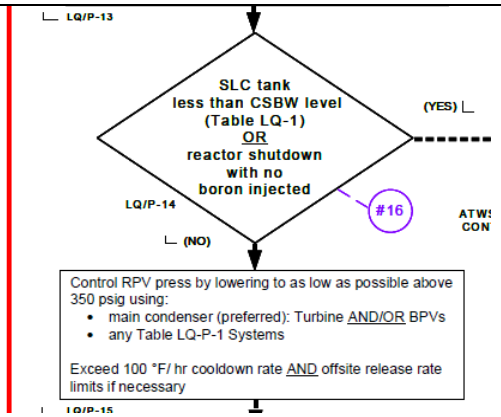
B. Control RPV pressure between 701 and 900 psig per T-117, ATWS RPV Control, exceeding cooldown rate if necessary

C. Control RPV pressure as low as possible but above 350 psig per T-117, ATWS RPV Control, exceeding cooldown rate and offsite release rate limits if necessary

D. Rapidly depressurize RPV until RPV press <50 psig above Suppression pool pressure per T-117, ATWS RPV Control

Answer: C

**Answer Explanation**




| | |
|---|---|
| **ANSWER (C)** | **Control RPV pressure as low as possible but above 350 psig per T-117, ATWS RPV Control, exceeding cooldown rate and offsite release rate limits if necessary; Correct:** The SP temperature of 177°F at a level of 23 feet is above the curve for 901-1170 psig. This means that HCTL could not be maintained on the safe side of the curve. Given that, T-102 step SP/T-7 directs an emergency blowdown per the controlling procedure which would be T-117. T-117 step LQ/P-1 directs LQ/P-13 if a ED is required.<br><br>Proceeding through the ED section, the operator must determine if SLC CSBW has been injected (LQ/P-14). The stem of the question states that SLC injection line broken. Therefore LQ/P-14 is answered NO and LQ/P-15 directs "Control RPV press by lowering to as low as possible above 350 psig." |
| **DISTRACTOR (A)** | **Lower Suppression Pool level to 21 ft. per T-102, Primary Containment Control; Wrong:** Plausible to the candidate who interprets the graph to indicate that a change in water level would restore the operating point to the safe side of the curve. However, since the curve has already been exceeded, this action is forestalled by the required action to depressurize. Also 21 feet would be below the normal operating level of the SP.(22-24 ft) |
| **DISTRACTOR (B)** | **Control RPV pressure between 701 and 900 psig per T-117, ATWS RPV Control, exceeding cooldown rate if necessary; Wrong:** Plausible to the candidate who recalls that RPV pressure may be lowered to maintain the safe side of HCTL. However, once the curve is exceeded, the blowdown must occur as directed by T-102, SP/T-6. |
| **DISTRACTOR (D)** | **Rapidly depressurize RPV until RPV press <50 psig above Suppression pool pressure per T-117, ATWS RPV Control; Wrong:** Plausible to the candidate who determines that because the operating point is above the HCTL curve, a blowdown is required per T-102 which directs the user to T-117. However, since CSBW was not injected and the reactor is not shutdown, pressure should not be lowered to below 350 psig |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164212 |
| User-Defined ID: | Q #79 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 EA2.03<br>4.0 |
| **KA Statement** | **Suppression Pool High Water Temperature: Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE:** Reactor pressure |
| **Cognitive level** | High |
| **Safety Function** | 5 - Primary Containment |
| **10 CFR 55** | 43.5 |
| **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:** | |
| **Training Objective** | LGSOPS1560.04 |

**80** **ID: 2164273** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is operating at 15% power with an ATWS in progress

- RPV water level is currently -175 inches on Fuel Zone
- ADS SRVs are being cycled to maintain Rx pressure between 990 to 1096 psig
- Suppression Pool temperature is 121° F up slow
- Total MSL flow is 1.55 Mlbm/hr

What is the required action and the bases for that action?

| | Required Action | Bases |
|---|---|---|
| A. | Control injection as low as possible above 1.2 Mlbm/hr and maintain MSL flow above MCSF | Lowest steam flow to maintain PCT less than 1500°F |
| B. | Control injection as low as possible above 1.2 Mlbm/hr and maintain MSL flow above MCSF | Prevent core thermal hydraulic instabilities |
| C. | Maintain RPV level between -186 inches and the level to which it was lowered | Lowest steam flow to maintain PCT less than 1500°F |
| D. | Maintain RPV level between -186 inches and the level to which it was lowered | Prevent core thermal hydraulic instabilities |

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **Control injection as low as possible above 1.2 Mlbm/hr and maintain MSL flow above MCSF, Lowest steam flow to maintain PCT less than 1500°F; Correct:** Based on T-117 step 8, when all conditions in table LQ/L-4 are met:<br>• Power >11.5%<br>• RPV level below -161"<br>• Any SRV open or DW press > 1.68#<br>Then control RPV injection as low as possible above 1.2 Mlbm/hr and maintain injection above MCSF<br><br>MCSF is defined in table LQ-P-2 as MSL flow >1.2 Mlbm/hr or Rx power >11.5% or BPV or SRV open based on pressure.<br><br>The bases for T-117 list the definition for MCSF as the lowest steam flow which is sufficient to preclude any clad temp from exceeding 1500°F |
| **DISTRACTOR (B)** | **Control injection as low as possible above 1.2 Mlbm/hr and maintain MSL flow above MCSF, Prevent core thermal hydraulic instabilities; Wrong:** Plausible to the candidate who incorrectly recalls the bases for the first lowering below -50" which is for THI prevention. this is not the bases for the lowering of injection to MCSF |
| **DISTRACTOR (C)** | **Maintain RPV level between -186 inches and the level to which it was lowered, Lowest steam flow to maintain PCT less than 1500°F; Wrong:** Plausible to the candidate who recalls the action to level control when it is determined that MSL flow is below the MCSF value. At the current power level and open SRV condition, this level band would cause too much heat to be added to the Suppression Pool |
| **DISTRACTOR (D)** | **Maintain RPV level between -186 inches and the level to which it was lowered, Prevent core thermal hydraulic instabilities; Wrong:** Plausible to the candidate who recalls the action to level control when it is determined that MSL flow is below the MCSF value. Also who incorrectly recalls the bases for the first lowering below -50" which is for THI prevention. this is not the bases for the lowering of injection to MCSF |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164273 |
| User-Defined ID: | Q #80 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | (SRO Only) ATWS Bases |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 295037 2.4.18<br>3.3 / 4.0 |
| **KA Statement** | **SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: Knowledge of the specific bases for EOPs**. |
| **Cognitive level** | High |
| **Safety Function** | 1 - Reactivity control |
| **10 CFR 55** | 43.5 |
| **Technical Reference with Revision No:** | T-117 Bases Rev 022<br>T-117 Rev 023 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS |

**81** **ID: 2164459** **Points: 1.00**

**********SRO ONLY**********

LGS Unit 2 is operating at 100% power

The following alarms are received in rapid succession:

- RCIC pump room fire alarm
- A report of fire and heavy smoke in the RCIC room is called in to the MCR

SE-8, "FIRE" is entered and executed

Two minutes later Div 1 Steam leak detection alarm is received.

In addition to entering SE-8, FIRE, what actions are required for the above scenario?

A. Exit SE-8 and enter T-103, SE-8 is re-entered at the same step in-progress when T-103 is exited

B. Exit SE-8 and enter T-103, SE-8 entry is re-evaluated when T-103 is exited

C. Enter T-103 and continue performing SE-8 actions. SE-8 is the controlling procedure

D. Enter T-103 and continue performing SE-8 actions. T-103 is the controlling procedure

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **Enter T-103 and continue performing SE-8 actions. T-103 is the controlling procedure; Correct:** Based upon the conditions given, Fire alarm and report of fire in RCIC, SE-8 is entered and the fire brigade be dispatched:<br>When the Div 1 Steam Leak Detection alarm is received, T-103 is entered.<br><br>EOPs are the top of the procedure Hierarchy and must be the governing procedure |
| **DISTRACTOR (A)** | **Exit SE-8 and enter T-103, SE-8 is re-entered at the same step in-progress when T-103 is exited; Wrong:** Plausible to the candidate who knows that EOPs are the governing procedure and assumes that similar to SAMPs, all other procedures must be exited when TRIPS are entered. This is incorrect as EOPs are the superior document but AOPs should be performed in parallel. |
| **DISTRACTOR (B)** | **Exit SE-8 and enter T-103, SE-8 entry is re-evaluated when T-103 is exited; Wrong:** Plausible to the candidate who knows that EOPs are the governing procedure and assumes that similar to SAMPs, all other procedures must be exited when TRIPS are entered. This is incorrect as EOPs are the superior document but AOPs should be performed in parallel. |
| **DISTRACTOR (C)** | **Enter T-103 and continue performing SE-8 actions, SE-8 is the controlling procedure Wrong:** Plausible to the candidate who knows that EOPs and AOPs are performed in parallel but incorrectly assumes that since the AOPs are generally more detailed, their direction must be followed. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 81 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 |
| | |
| System ID: | 2164459 |
| User-Defined ID: | Q #81 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | (SRO Only) Plant Fire AOP/EOP |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | | |
|---|---|---|
| **Level** | SRO | |
| **Tier** | 1 | |
| **Group** | 1 | |
| **KA # and Rating** | 600000 / G2.4.8<br>4.5 | |
| **KA Statement** | Plant Fire On Site: Knowledge of how abnormal operating procedures are used in conjunction with EOPs. | |
| **Cognitive level** | High | |
| **Safety Function** | 8 -Plant Service Systems | |
| **10 CFR 55** | 43.5 | |
| **Technical Reference with Revision No:** | SE-8<br>T-103 | Rev 060<br>Rev 025 |
| **Question History: (i.e. LGS NRC-05)** | New | |
| **Question Type: (New, Bank, Modified)** | New | |
| **Revision History:** | | |
| **Training Objective** | LGSOPS2000.02 | |

**82** **ID: 2164477** **Points: 1.00**

**********SRO ONLY**********

Both Unit 1 and Unit 2 are operating at 100% power.

All 4 KV buses are aligned normally.

- PJM has issued a Voltage Reduction Alert

TSO notifies LGS that:

- 230 KV Switchyard Voltage is 224 KV
- 500 KV Switchyard Voltage is 499 KV

WHICH ONE of the following identifies the status of the 10 Bus and 20 Bus Offsite Sources?

| | 10 BUS SOURCE | 20 BUS SOURCE |
|---|---|---|
| A. | OPERABLE | OPERABLE |
| B. | OPERABLE | INOPERABLE |
| C. | INOPERABLE | OPERABLE |
| D. | INOPERABLE | INOPERABLE |

Answer: D

**Answer Explanation**

Refer to E-5 Grid Emergency. There are three sections/steps in this procedure that need to be evaluated against the existing 230 KV and 500 KV system voltages given in the stem: Steps 3.14.1

Step 3.14.1 directs operators to declare as INOPERABLE the 10 Bus Source if it drops below 225 KV (given to be 225 KV in the stem; therefore, the 10 Bus Source is OPERABLE. Step 3.14.1 also directs operators to declare as INOPERABLE the 20 Bus source if the 230KV source drops below 225 KV (therefore, the 20 Bus Source is also INOPERABLE)

| SOURCE | TRANSMISSION SYSTEM | MINIMUM VOLTAGE |
|---|---|---|
| 10 Bus | 230 kV System | 225 kV |
| 20 Bus | 500 kV System | 498 kV |
| | 230 kV System | 225 kV |
| 6680 Line | 69 kV System | 67.5 kV (when connected as 3rd offsite source) |

| | |
|---|---|
| **ANSWER (D)** | **INOPERABLE, INOPERABLE; Correct:** Since the 230KV bus has low voltage, both the 10 bus and the 20 bus are inop per the table above. |
| **DISTRACTOR (A)** | **OPERABLE, OPERABLE; Wrong:** Plausible to the examinee who incorrectly recalls the limits of the tables in E-5 and determines that both sources are operable |
| **DISTRACTOR (B)** | **OPERABLE, INOPERABLE; Wrong:** Plausible misconception that 223 KV is acceptable voltage and 499KV is too low |
| **DISTRACTOR (C)** | **INOPERABLE, OPERABLE; Wrong:** Plausible to the examinee who identifies that the voltage of the 230 KV yard is low which INOPs the 10 bus but does not recognize that this also INOPs the 20 bus. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 82 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 |
| | |
| System ID: | 2164477 |
| User-Defined ID: | Q #82 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | (SRO ONLY) Grid Emergency Op Status |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | Candidates must know the reasons for the Grid operable status to answer this question. To determine operability, they must know low voltage on the 230 KV bus impacts both sources. |
| **SRO-Only Justification** | This question is SRO level because it requires the candidate to assess facility/ grid conditions and determine that grid voltage is below the minimum required for operability. |
| **Additional Information** | None |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 1 |
| **KA # and Rating** | 700000 AA2.05<br>3.8 |
| **KA Statement** | Generator Voltage and Electric Grid Disturbances: Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Operational status of offsite circuit. |
| **Cognitive level** | High |
| **Safety Function** | 6 - Electrical |
| **10 CFR 55** | 41.5 and 43.5 / 45.5, 45.7, and 45.8 |
| **Technical Reference with Revision No:** | E-5 Rev. 028 |
| **Question History: (i.e. LGS NRC-05)** | NEW |
| **Question Type: (New, Bank, Modified)** | NEW |
| **Revision History:** | |
| **Training Objective** | LGSOPS1578.2 |

**83** **ID: 2164476** **Points: 1.00**

**********SRO ONLY**********

Unit 1 was operating at rated thermal power when a loss of feedwater heating resulted in the following:

- At time 02:45, MFLPD is 1.01

Operators lower recirc flow with Recirc and a new P-1 was demanded

- At time 02:50, MCPR is 1.06

(1) At what time was the Reactor Core Safety Limit (SL) violated?
(2) What are the TS notification requirements for this event?

| | Time of Safety Limit Violation | Notification |
|---|---|---|
| A. | 02:45 | 8 hour notification to the NRC Operations Center |
| B. | 02:45 | 1 hour notification to the NRC Operations Center |
| C. | 02:50 | 8 hour notification to the NRC Operations Center |
| D. | 02:50 | 1 hour notification to the NRC Operations Center |

Answer: D

**Answer Explanation**

| | |
|---|---|
| **ANSWER (D)** | **02:50, 1 hour notification to the NRC Operations Center; 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." With any SL violation, 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 (A)** | **02:45, 8 hour notification to the NRC Operations Center; Wrong:** Plausible to the candidate who recalls the limit for MFLPD as 1.00 and as an entry into GP-14. This is a tech spec issue but not a safety limit violation. 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. |
| **DISTRACTOR (B)** | **02:45, 1 hour notification to the NRC Operations Center; Wrong:** Plausible to the candidate who recalls the limit for MFLPD as 1.00 and as an entry into GP-14. This is a tech spec issue but not a safety limit violation. |
| **DISTRACTOR (C)** | **02:50, 8 hour notification to the NRC Operations Center; 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. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2164476 |
| User-Defined ID: | Q #83 BANK |
| 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** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295014 / G2.4.30<br>4.1 |
| **KA Statement** | Inadvertent Reactivity Addition: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. |
| **Cognitive level** | High |
| **Safety Function** | 1 |
| **10 CFR 55** | 43.2 |
| **Technical Reference with Revision No:** | LGS Tech spec 2.1.2<br>Amend: 236 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank(1142300) |
| **Revision History:** | |
| **Training Objective** | LGSOPS1800.06c |

**84** **ID: 2170756** **Points: 1.00**

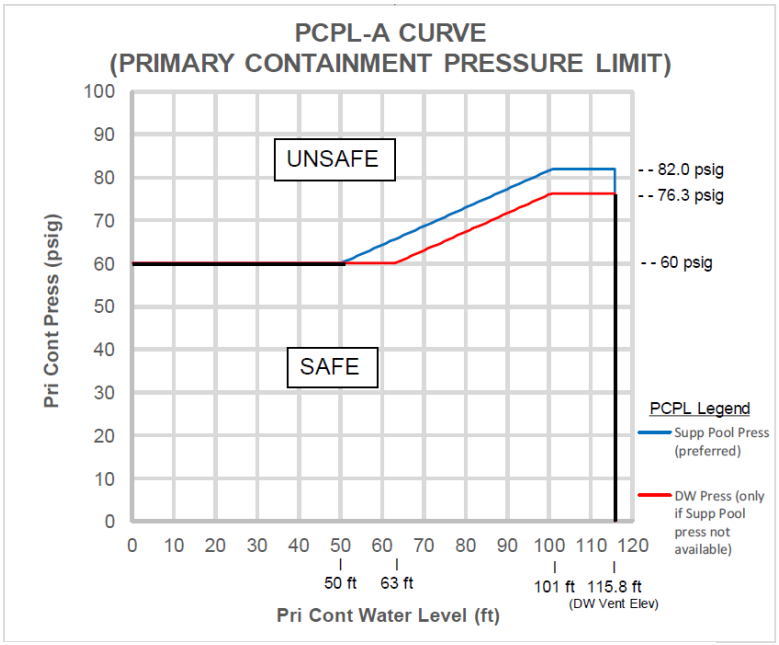
**********SRO ONLY**********

Unit 1 plant conditions:

- Reactor is shutdown
- LOCA in progress

Drywell spray has been in service for several days

- Suppression Pool Level indicates 50 feet
- Drywell Pressure indicates 69 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 |

Given: T-200- Primary Containment Emergency Vent Procedure
T-341- Primary Containment Venting Via Hardened Containment Vent System

# Test Answer Key

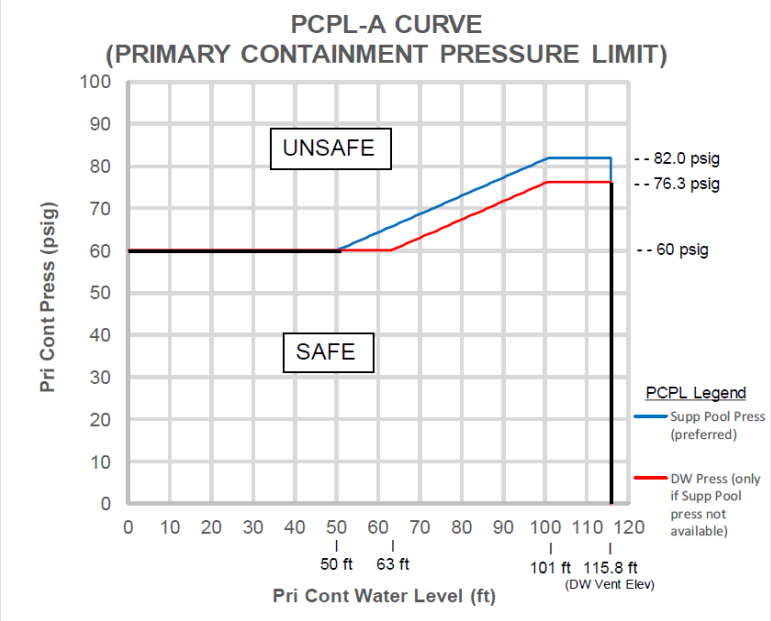
LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

What is the Containment Level and what action is required?

| | Containment Level | Required Action |
|---|---|---|
| A. | 50 ft. | Vent containment per T-200 |
| B. | 50 ft. | Vent containment per T-341 |
| C. | 62 ft. | Vent containment per T-200 |
| D. | 62 ft. | Vent containment per T-341 |

Answer: C

**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)** | **62 ft., Vent containment per T-200; 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 [(75-69) X 2.3] + 48 ft.= 61.8 ft. rounded to 62 ft. When this is plotted on the PCPL curve, we are on the unsafe portion of the curve. To return to the safe side, containment pressure must be lowered per T-102, PC/P-10. T-200 will be used to lower pressure by venting the drywell. |
| **DISTRACTOR (A** | **50 ft., Vent containment per T-200; Wrong:** Plausible to the candidate who uses the indicated level and does not recall that suppression pool level above 48 ft is not valid on the level transmitter indication and must be calculated. |
| **DISTRACTOR (B** | **50 ft., Vent containment per T-341; Wrong:** Plausible to the candidate who uses the indicated level and does not recall that suppression pool level above 48 ft is not valid on the level transmitter indication and must be calculated. The action is plausible to the candidate who determines that pressure must be lowered to restore the safe side of the curve but does not recall that the HCVS vent port is at elevation 38.25 ft in the suppression pool and is therefore unavailable. |
| **DISTRACTOR (D)** | **62 ft., Vent containment per T-341; Wrong:** The action is plausible to the candidate who determines that pressure must be lowered to restore the safe side of the curve but does not recall that the HCVS vent port is at elevation 38.25 ft. in the suppression pool and is therefore unavailable.. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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 |
| | |
| System ID: | 2170756 |
| User-Defined ID: | Q #84 NEW |
| Cross Reference Number: | OPEN EMBEDDED |
| | |
| Topic: | (SRO Only) High Containment Water Level |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | ILT |

Comments:

| | |
|---|---|
| **References Provided** | Embedded Picture -PCPL curve |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

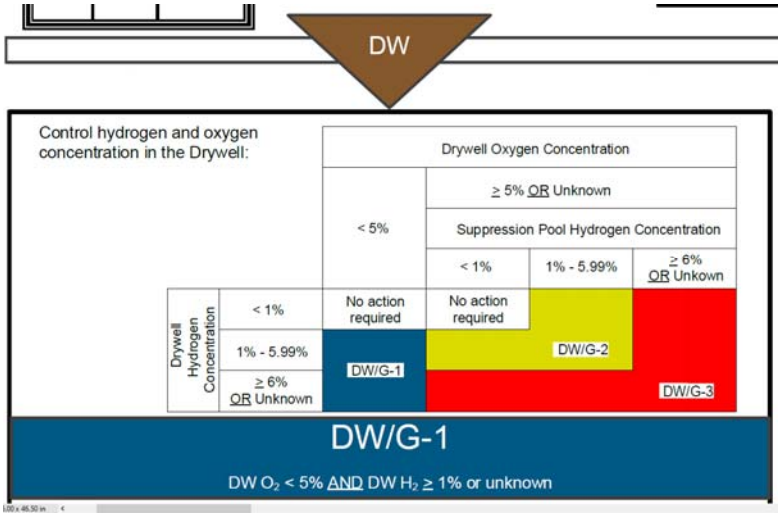
| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 295029 EA2.03<br>3.5 |
| **KA Statement** | High Suppression Pool Water Level: Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Drywell/containment water level. |
| **Cognitive level** | High |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | 43.2/43.5 |
| **Technical Reference with Revision No:** | T-102 rev. 028<br>T-102 Bases rev. 028 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.02C |

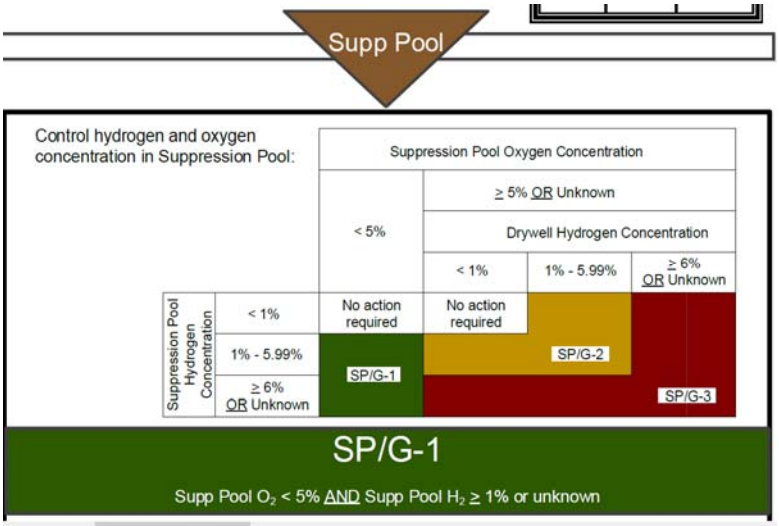
**85** **ID: 2166216** **Points: 1.00**

**********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 1 hour ago
- Drywell Hydrogen is 5.5%
- Drywell Oxygen is 6.8%
- Suppression Pool Hydrogen is 1.2%
- Suppression Pool Oxygen is 4.5%



# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

WHICH ONE of the following identifies the actions for Containment atmosphere control, (if any)?

A. Vent the Suppression Pool up to the General Emergency limits

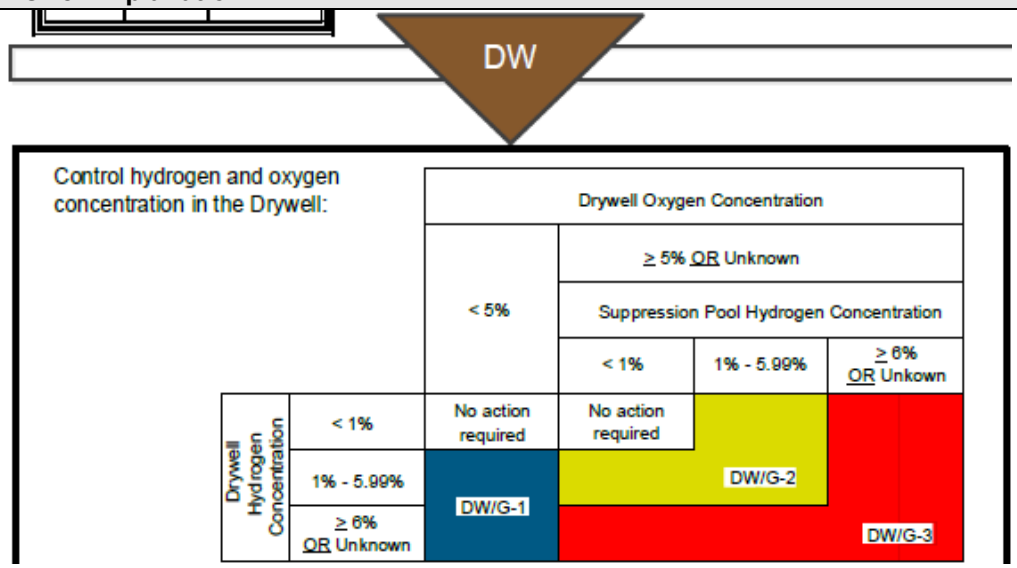
B. Vent the Suppression Pool regardless of Offsite release limits

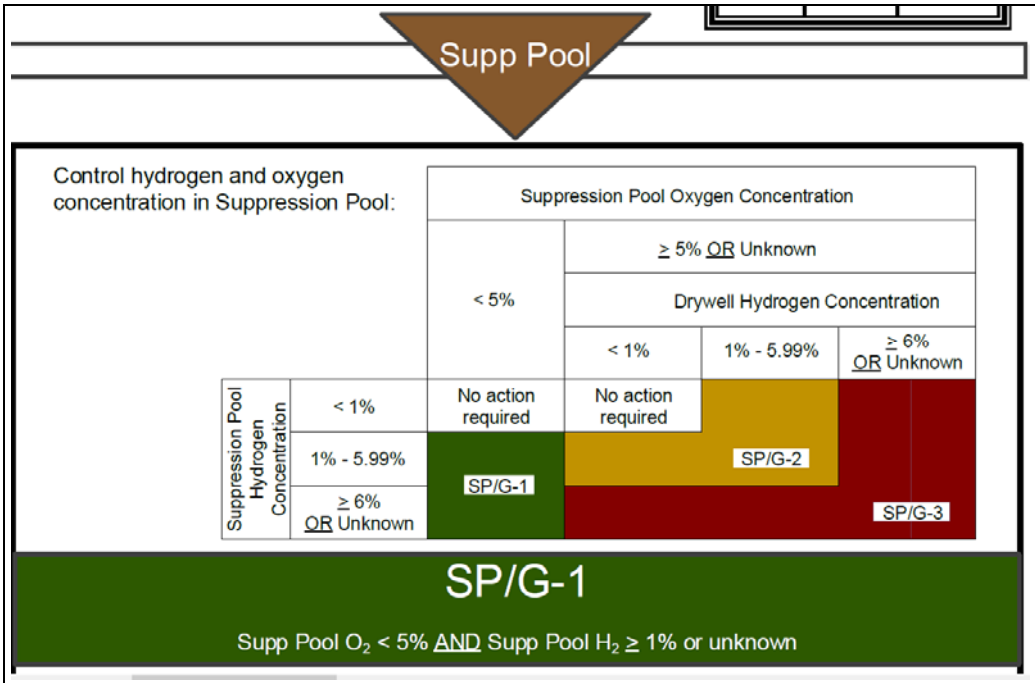
C. Vent the Drywell up to the General Emergency limits

D. Vent the Drywell regardless of Offsite release limits

Answer: C

**Answer Explanation**






Based on the conditions presented, Drywell Hydrogen is 5.5% therefore the candidate should use the middle row on the left column for 1%-5.99%. Then evaluating DW O2 at 6.8% means that the candidate should evaluate the Suppression pool H2 concentration which is 1.2%. Therefore the 1%-5.99% column is selected. This would then direct the use of DW/G-2 which is the intersection of 1%-5.99 DW H2 and 1%-5.99% SP H2.
DW/G-2 contains the step to vent up to the limits of General Emergency.

| | |
|---|---|
| **ANSWER (C)** | **Vent the Drywell up to the General Emergency limits; Correct:** As noted above, evaluating the table would lead to DW/G-2 as the strategy venting within the General Emergency limits is the directed action for the DW. TSG-3.3 allows the candidate to translate DW/G-2 to the General Emergency 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-1 is correct and mistakenly assumed that General Emergency Limits encompassed TS limits. GE limits are actually above |
| **DISTRACTOR (B)** | **Vent the Suppression Pool regardless of Offsite release limits; Wrong:** Plausible to the candidate who incorrectly evaluates the SP table and determines that SP/G-3 is the correct strategy by using DW H2 concentration instead of SP H2 concentration in the Left side SP H2 concentration and uses the DW O2 concentration instead of the SP O2. |
| **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-2 is correct |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2166216 |
| User-Defined ID: | Q #85 NEW |
| Cross Reference Number: | OPEN |
| | |
| Topic: | SRO Only - SAMP 2 H2 Combustion Limit |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | TSG-3.3 Pg. 1,<br>Embedded Ref. SAMP 2, DW/G and SP/G Tables |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 1 |
| **Group** | 2 |
| **KA # and Rating** | 500000 EA2.03<br>3.8 |
| **KA Statement** | **High Containment Hydrogen Concentration: Ability to determine and / or interpret the following as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS:** Combustible limits for drywell |
| **Cognitive level** | High |
| **Safety Function** | 5 - Containment Integrity |
| **10 CFR 55** | |
| **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 |

**86** **ID: 2166256** **Points: 1.00**

**********SRO ONLY**********

Unit 2 plant conditions:

- OPCON 5
- Reactor level is 217"
- '2A' RHR is in Shutdown Cooling
- HV-51-2F008, SHUTDOWN COOLING SUCTION OUTBOARD, fails closed and cannot be reopened

WHICH ONE of the following identifies the:

(1) Tech Spec required action, and
(2) basis for performing that action?

A. (1) Place ADHR in service
(2) To maintain and reduce reactor coolant temperature

B. (1) Place ADHR in service
(2) To assure accurate reactor coolant temperature indication

C. (1) Place 'A' Recirc pump in service
(2) To maintain and reduce reactor coolant temperature

D. (1) Place 'A' Recirc pump in service
(2) To assure accurate reactor coolant temperature indication

Answer: D

**Answer Explanation**

From the stem, the candidate determines that SDC has no suction path (HV-51-2F008 closed). Tech Spec 3.9.11.2 action c.1 requires the verification of reactor coolant circulation by an alternate method.

c. With no RHR shutdown cooling subsystem in operation:

1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulation by an alternate method; and

2. Once per hour monitor reactor coolant temperature.

The current plant configuration does not support placing ADHR in service due to the need to have the Reactor cavity flooded up.

Placing a Recirc loop in service satisfies Tech Spec 3.9.11.2, ACTION c.1. This only provides for the coolant circulation need to ensure proper reactor coolant temperature monitoring; it does NOT constitute an "alternate Decay Heat Removal method."

Tech Spec 3.9.11 Bases:

An OPERABLE RHR shutdown cooling subsystem consists of one (1) OPERABLE RHR pump, one (1) heat exchanger, and the associated piping and valves. The requirement for having one (1) RHR shutdown cooling subsystem OPERABLE ensures that 1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F, and 2) sufficient coolant circulation would be available through the reactor core to assure accurate temperature indication. Management of gas voids is important to RHR Shutdown Cooling Subsystem OPERABILITY.

S51.5.H, RHR Alternate Decay Heat Removal, Prerequisite # 2.7:

2.7 Reactor Cavity is flooded up with Skimmer Surge Tank (SST) level equal to Reactor Cavity level
**AND** the associated Fuel Pool gates are removed per GP-6.1, Shutdown Operation - Refueling, Core Alteration and Core Off-Loading.

| | |
|---|---|
| **ANSWER (D)** | **(1) Place 'A' Recirc pump in service, (2) To assure accurate reactor coolant temperature indication; Correct:** For the above reasons. |
| **DISTRACTOR (A)** | **(1) Place ADHR in service, (2) To maintain and reduce reactor coolant temperature; Wrong:** Plausible to the candidate that fails to recall that ADHR cannot be placed in service without the Reactor cavity being flooded. Operation of ADHR would support maintaining and reducing reactor coolant temperature. |
| **DISTRACTOR (B)** | **(1) Place ADHR in service,(2) To assure accurate reactor coolant temperature indication; Wrong:** Plausible to the candidate that fails to recall that ADHR cannot be placed in service without the Reactor cavity being flooded. Operation of ADHR would support ensuring adequate monitoring of reactor coolant temperature. |
| **DISTRACTOR (C)** | **(1) Place 'A' Recirc pump in service, (2) To maintain and reduce reactor coolant temperature; Wrong:** Plausible to the candidate who believes core circulation with recirc is credited as an alternate method of decay heat removal. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 86 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 |
| | |
| System ID: | 2166256 |
| User-Defined ID: | Q #86 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO ONLY - OPCON 5 - Loss of SDC and Tech Spec bases |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | | | |
|---|---|---|---|
| **Level** | SRO | | |
| **Tier** | 2 | | |
| **Group** | 1 | | |
| **KA # and Rating** | 205000 / G 2.2.37<br>4.6 | | |
| **KA Statement** | Shutdown Cooling / Ability to determine operability and/or availability of safety related equipment | | |
| **Cognitive level** | High | | |
| **Safety Function** | 4 - Heat Removal | | |
| **10 CFR 55** | 43(b)(2) | | |
| **Technical Reference with Revision No:** | Tech Spec 3.9.11.2<br>T.S. Bases 3.9.11 | **Rev #:** | |
| **Question History: (i.e. LGS NRC-05)** | LGS NRC 15-1 | | |
| **Question Type: (New, Bank, Modified)** | Bank | | |
| **Revision History:** | | | |
| **Training Objective** | LGSOPS0051.24B | | |

Lesson Plan: LGSOPS0051 Obj. 24

**87** **ID: 2166295** **Points: 1.00**

**********SRO ONLY**********

Unit 1 is operating at 100%

- 1C LPCI is tagged out for maintenance and will not be restored for 8 days

The following alarm is received:

- 113-B5, "Core Spray Line Internal Break"
- All pumps have been verified off

I&C investigates and reports that the valid D/P reading is -4.6 psid

What is the most limiting tech spec based on the above conditions?

A. Declare Core Spray Instrumentation INOPERABLE and restore to OPERABLE status within 72 hours

B. Declare the 'A' Core Spray loop INOPERABLE and restore to OPERABLE status within 7 days

C. Declare the 'B' Core Spray loop INOPERABLE and restore to OPERABLE status within 7 days

D. Declare Both Core Spray Loops INOPERABLE and be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the next 24 hours

Answer: C

**Answer Explanation**

From the ARC 113-B5:

3. IF signal is valid AND dP is less than -3.8 psid, THEN declare `B' Core Spray loop INOPERABLE due to a pipe break AND consider a normal plant shutdown per GP-3.

From Tech specs:

3.5.1 The emergency core cooling systems shall be OPERABLE with:
a. The core spray system (CSS) consisting of two subsystems with each subsystem comprised of:
1. Two OPERABLE CSS pumps, and
2. An OPERABLE flow path capable of taking suction from the suppression chamber and transferring the water through the spray sparger to the reactor vessel.

| | |
|---|---|
| **ANSWER (C)** | **Declare the 'B' Core Spray loop INOPERABLE and restore to OPERABLE status within 7 days; Correct:** The indications of D/P of -4.6 psid indicate a break in the "B" CS subsystem per the ARC above. Tech spec 3.5.1 action a.1. requires Restore the inoperable Core Spray subsystem to OPERABLE status within 7 days , |
| **DISTRACTOR (A)** | **Declare Core Spray Instrumentation INOPERABLE and restore to OPERABLE status within 72 hours; Wrong:** Plausible to the candidate who believes that the CS break detection instrument is faulty and applies the spec 3.5.1.e for 72 hour action. Reading is valid per the stem |
| **DISTRACTOR (B)** | **Declare the 'A' Core Spray loop INOPERABLE and restore to OPERABLE status within 7 days; Wrong:** Plausible if the candidate determines that the A CS loop is INOP based on the mis-applying the ARC direction. This is incorrect, |
| **DISTRACTOR (D)** | **Declare Both Core Spray Loops INOPERABLE and be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the next 24 hours; Wrong:** Plausible to the candidate who applies action 3.5.1.a.2 for both Core Spray subsystems INOP rather than using the ARC direction which will identify the correct subsystem.. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2166295 |
| User-Defined ID: | Q #87 NEW |
| Cross Reference Number: | OPEN |
| | |
| Topic: | SRO Only - Core Spray Line Break |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | ARC-MCR-113 B5: Core Spray Line Internal Break,<br>TS 3.5.1 pg 3.5-1 to 3.5-3 |
| **K/A Justification** | |
| **SRO-Only Justification** | This question requires the candidate to evaluate the operability of the Core spray system and |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 2 |
| **Group** | 1 |
| **KA # and Rating** | 209001 A2.05<br>3.6 |
| **KA Statement** | **Low Pressure Core Spray:** Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: **Core spray line break** |
| **Cognitive level** | High |
| **Safety Function** | 2 - Rx Water Inventory Control |
| **10 CFR 55** | 43.2 |
| **Technical Reference with Revision No:** | Unit 1 Tech specs<br>ARC-MCR-113 B5 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0052.14B |

**88** **ID: 2201879** **Points: 1.00**

************ SRO ONLY ************

Fuel is being loaded into the core on Unit 1, with the following:

- '1A' SRM count rate is 4.0 cps and has a signal-to-noise ratio of 3.5
- '1B' SRM was declared inoperable last shift due to spiking
- '1C' SRM count rate is 1.4 cps and has a signal-to-noise ratio of 6.0
- '1D' SRM count rate is 1.0 cps and has a signal-to-noise ratio of 10.0

WHICH ONE of the following describes the limitations regarding loading fuel into the core?

A. All fuel loading must be suspended immediately

B. Fuel may be loaded into “A” or “C” core quadrants ONLY

C. Fuel may be loaded into “A” or “D” core quadrants ONLY

D. Fuel may be loaded into “A”, "C" or “D” core quadrants ONLY.

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **All fuel loading must be suspended immediately; Correct:** As seen on the graph, once count rate exceeds approximately 2.3 any signal to noise ratio> approximately 2 will result in an operable SRM.<br>“1B” and “1D” SRMs are INOPERABLE (“1D” due to inadequate Signal-To-Noise Ratio per Technical Specification Figure 3.3.6-1). Therefore, fuel movement is not permitted due to not meeting the requirements of Tech Speck LCO 3.9.2.c.<br>Limerick Core quadrants are laid out as follows:<br><br>AB<br>DC |
| **DISTRACTOR (B)** | **Fuel may be loaded into “A” or “C” core quadrants ONLY; Wrong:** Plausible to the candidate that correctly determines that 1B and 1D SRMs are INOP but incorrectly applies Tech Spec 3.9.2 and fails to identify the adjacent quadrant requirement. |
| **DISTRACTOR (C)** | **Fuel may be loaded into “A” or “D” core quadrants ONLY; Wrong:** Plausible to the candidate that mistakenly determines 1C SRM is INOP instead of 1D (applying Figure 3.3.6-1 incorrectly). |
| **DISTRACTOR (D)** | **Fuel may be loaded into “A”, "C" or “D” core quadrants ONLY; Wrong:** Plausible to the candidate that mistakenly determines no additional SRMs are INOP due to assessing Signal to noise ratio incorrectly. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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: | 2.00 |
| | |
| System ID: | 2201879 |
| User-Defined ID: | Q #88 BANK |
| Cross Reference Number: | OPEN EMBEDDED |
| | |
| Topic: | (SRO ONLY) - Tech Spec - SRM Operability During Fuel Loading |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ct |

Comments:

| | |
|---|---|
| **References Provided** | TS 3.3.6 S/N Ratio curve |
| **K/A Justification** | |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | | | |
|---|---|---|---|
| **Level** | RO | | |
| **Tier** | 2 | | |
| **Group** | 1 | | |
| **KA # and Rating** | 215004 A2.02<br>3.7 | | |
| **KA Statement** | **Source-Range Monitor;** Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: **SRM inop condition** | | |
| **Cognitive level** | High | | |
| **Safety Function** | 7 - Instrumentation | | |
| **10 CFR 55** | 43.5 | | |
| **Technical Reference with Revision No:** | Tech Specs<br>LCO 3.9.2<br>TS 3.3.6 | **Rev #:** | 186<br><br>34 |
| **Question History: (i.e. LGS NRC-05)** | January 2017 NRC Q#99 | | |
| **Question Type: (New, Bank, Modified)** | Bank 1454568 | | |
| **Revision History:** | | | |
| **Training Objective** | LGSOPS0074.10A | | |

**89** **ID: 2166780** **Points: 1.00**

**********SRO ONLY**********

Unit 1 entered E-1, "Loss of All AC Power (Station Blackout)," 5 hours ago, following full power operation

Reactor Water Level is -56 inches down slow

- Rx Pressure is 225 psig and efforts to depressurize have been unsuccessful
- Current Suppression Pool temperature is 175°F up slow

Which of the following actions should be directed to restore level?

A. Inject with Flex Pump per T-301, RPV Injection From Spray Pond

B. Inject with RCIC using T-305, Local Operation of RCIC without DC Power

C. Inject with HPCI thru T-251, Establish a HPCI Injection Flow Path Via Feedwater Only

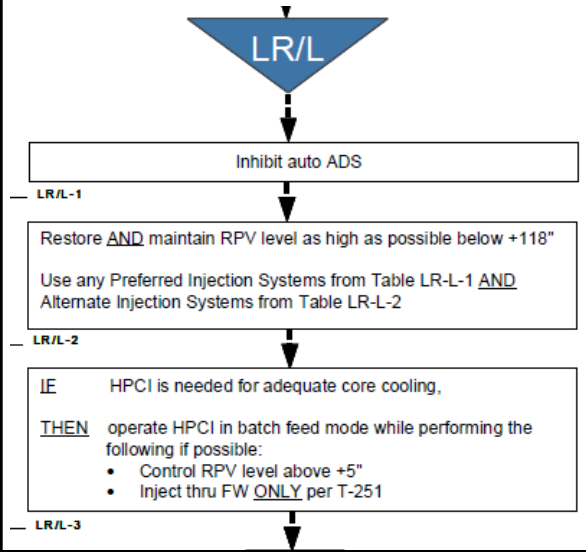
D. Inject with the Diesel Driven Fire Pump per T-244, Alternate Injection From The Fire System

Answer: B

**Answer Explanation**

**TABLE LR-L-1**
**Preferred Injection Systems**

| System | Max RPV Inj Press (psig) | Operating Details |
|---|---|---|
| Condensate/ Feedwater | 680/ 1200 | Defeat high RPV level (T-239) |
| CRD | 1200 | Maximize flow as necessary (T-240) |
| RCIC | 1200 | • CST preferred<br>• Defeat high RPV level (T-239)<br>• Defeat high exhaust press (T-238)<br>• Defeat low steam press (T-247)<br>• Defeat high area temp (T-249)<br>• Defeat DW press test return isol (T-242)<br>• Operate locally if required (T-305)<br>• RCIC trips @ 50 psig exhaust press<br>• Operate less than 2200 RPM if necessary. Equipment damage may occur.<br>• Exceed NPSH and vortex limits (per T-102 sh. 2) if necessary. Equipment damage may occur.<br>• 170 °F – 215 °F suct temp<br>▪ No loss of function<br>▪ Batch feed OK<br>• 215 °F – 250 °F suct temp<br>▪ Degraded performance<br>▪ No loss of function<br>▪ Batch feed not recommended<br>▪ Seal leakage insignificant<br>• 250 °F – 300 °F suct temp<br>▪ Increased performance loss<br>▪ Increased seal leakage |
| HPCI | 1200 | • CST preferred<br>• If required, thru Feedwater ONLY (T-251)<br>• Defeat high RPV level (T-239)<br>• Defeat high area temp (T-249)<br>• Defeat high Supp Pool swapover (T-246)<br>• Defeat DW press test return isol (T-242)<br>• Max 170 °F suct temp<br>• Operate less than 2200 RPM if necessary. Equipment damage may occur.<br>• Exceed NPSH and vortex limits (per T-102 sh. 2) if necessary. Equipment damage may occur.<br>• Operation with Supp Pool < 18' raises Supp Pool press |



| TABLE LR-L-2<br>Alternate Injection Systems<br>(TSG-3.18) | | |
|---|---|---|
| System | Max RPV Inj Press (psig) | Pump Capacity (gpm) |
| SLC:<br>• SLC Tank (S48.1.B App. 1)<br>• Test Tank (T-248) | 1200 | 74 (2 pumps) |
| CRD (T-240) | 1200 | 400<br>(2 pumps) |
| Spray Pond Water via FLEX Pump (T-301) | 135 | 1000 |
| RHR SW Crosstie (T-243) | 120 | 3500 |
| Fire Water via Portable Pump (T-304) | 100 | 1000 |
| Condensate Transfer (T-241) | 80 | 1200<br>(2 pumps) |
| Fire System (T-244) | 70 | 250 |
| Refuel Water Transfer (T-241) | 40 | 3000<br>(2 pumps) |
| Safeguard Piping Fill (T-252) | 15 | 36<br>(2 pumps) |

Based on the provided conditions, no AC powered pumps are available, only Steam driven pumps and Diesel driven pumps are available. With the imminent Loss of Div 1 and Div 2 DC, RCIC and HPCI will not be available. With a high RPV pressure condition that resists efforts to depressurize, use of RCIC locally without DC power is the preferred option

| | |
|---|---|
| **ANSWER (B)** | **Inject with RCIC using T-305, Local Operation of RCIC without DC Power; Correct:** Because pressure is too high for Flex pump and fire pump options, local operation of RCIC should be directed. T-305 allows operation using local indications of speed and discharge pressure with I&C or others monitoring level at the transmitter. |
| **DISTRACTOR (A)** | **Inject with Flex Pump per T-301, RPV Injection From Spray Pond; Wrong:** Plausible to the candidate who recalls the flex pump is the primary option for higher capacity when all Station power is lost. The Flex system is the primary alternate injection system directed from T-111 that does not use station power. However, pressure is too high for flex usage. (135 psig) |
| **DISTRACTOR (C)** | **Inject with HPCI thru T-251, Establish a HPCI Injection Flow Path Via Feedwater Only; Wrong:** Plausible to the candidate who recalls that T-111 directs HPCI usage if available and only through T-251 flowpath. With the loss of DC power, no contingency procedure exists to use HPCI. |
| **DISTRACTOR (D)** | **Inject with the Diesel Driven Fire Pump per T-244, Alternate Injection From The Fire System; Wrong:** Plausible to the candidate who recalls that the Fire system is also an alternate injection strategy per T-111. But it only has a max press of 70 psig. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2166780 |
| User-Defined ID: | Q #89 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO Only - RCIC Use T-111 |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 2 |
| **Group** | 1 |
| **KA # and Rating** | 217000 / G 2.1.23<br>4.4 |
| **KA Statement** | Reactor Core Isolation Cooling; Ability to perform specific system and integrated plant procedures during all modes of plant operation |
| **Cognitive level** | High |
| **Safety Function** | 2 - Rx Water Inventory Control |
| **10 CFR 55** | 43.5 |
| **Technical Reference with Revision No:** | T-111 Rev. 018 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS1560.06 |

**90** **ID: 2167139** **Points: 1.00**

**********SRO ONLY**********

Unit 1 is operating at 100% power
Unit 2 is in refueling day 10

Core Shuffle 2 is in progress

- Annunciator 002-G4, "A REAC ENCL SGTS CHARCOAL FLT HI-HI TEMP/TROUBLE" alarms
- EO reports a Fire in the 0A SGTS Filter Train
- On panel 00C681, TI-76-010A (Charcoal Filter Temp), indicates 588 deg. F

Which one of the following actions is required for (1) the conditions given and (2) what is the Technical specification action required?

A. (1) Initiate the Deluge system manually per S76.7.B
(2) Suspend CORE ALTERATIONS immediately

B. (1) Initiate the Deluge system manually per S76.7.B
(2) Restore the INOPERABLE subsystem to operable status within 7 days, CORE ALTERATIONS may continue

C. (1) Verify the Deluge system has automatically initiated per S76.7.B
(2) Suspend CORE ALTERATIONS immediately

D. (1) Verify the Deluge system has automatically initiated per S76.7.B
(2) Restore the INOPERABLE subsystem to operable status within 7 days, CORE ALTERATIONS may continue

Answer: B

**Answer Explanation**

3.6.5.3 Two independent standby gas treatment subsystems shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, and when (1) irradiated fuel is being handled in the refueling area secondary containment, or (2) during CORE ALTERATIONS.

ACTION:

a. In OPERATIONAL CONDITION 1, 2, or 3:

1. With one standby gas treatment subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. When (1) irradiated fuel is being handled in the refueling area secondary containment, or (2) during CORE ALTERATIONS:

1. With one standby gas treatment subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days, or suspend handling of irradiated fuel in the secondary containment and CORE ALTERATIONS. The provisions of Specification 3.0.3 are not applicable.

| | |
|---|---|
| **ANSWER (B)** | **Initiate the Deluge system manually per S76.7.B**<br>**Restore the INOPERABLE subsystem to operable status within 7 days, CORE ALTERATIONS may continue; Correct:** With a fire in the filter train, S76.7.B directs the manual initiation of the deluge system for that train. There is no automatic initiation. Per TS 3.6.5.3.a, IN OPCON 1,2,3: With one SGTS inoperable, restore the inoperable subsystem to operable status within 7 days. Per 3.6.5.3.b, During Core alterations, With one SGTS inop, restore the INOP subsystem to Operable within 7 days or suspend Core Alterations. |
| **DISTRACTOR (A)** | **Initiate the Deluge system manually per S76.7.B**<br>**Suspend CORE ALTERATIONS immediately; Wrong:** Plausible to the candidate who recalls that SGTS must be operable to begin core alts but does not recall that 7 days is allowed when core alts are in progress. |
| **DISTRACTOR (C)** | **Verify the Deluge system has automatically initiated per S76.7.B**<br>**Suspend CORE ALTERATIONS immediately; Wrong:** Plausible to the candidate who recalls that a deluge system protects the filter train but does not recall that it is manually initiated and who recalls that SGTS must be operable to begin core alts but does not recall that 7 days is allowed when core alts are in progress |
| **DISTRACTOR (D)** | **Verify the Deluge system has automatically initiated per S76.7.B**<br>**Restore the INOPERABLE subsystem to operable status within 7 days, CORE ALTERATIONS may continue; Wrong:** Plausible to the candidate who recalls that a deluge system protects the filter train but does not recall that it is manually initiated. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167139 |
| User-Defined ID: | Q #90 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO Only - SGTS Hi Temp |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | None |
| **K/A Justification** | This question meets the KA because it requires the candidate to recall actions for high train temperature which are directed from S76.7.B |
| **SRO-Only Justification** | This question is SRO only because it requires knowledge of the TS actions for loss of SGTS trains during operation at power and during refueling. (55.43.2 and 55.43.5) |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 2 |
| **Group** | 1 |
| **KA # and Rating** | 216000 A2.03<br>3.2 |
| **KA Statement** | Standby Gas Treatment; Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High train temperature |
| **Cognitive level** | HIGH |
| **Safety Function** | 9 |
| **10 CFR 55** | 43.2, 43.5 |
| **Technical Reference with Revision No:** | S76.7.B Rev. 013<br>TS 3.6.5.3 Amend 227 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0076A.02G |

**91** **ID: 2201886** **Points: 1.00**

**********SRO ONLY**********

Unit 2 is at 100% power

- The RO performs Jet pump operability ST, ST-6-043-320-2 and determines that Jet Pump #4 has failed on loop B

What action is required per ON-100, "Failure of a Jet Pump", and the bases for that action?

| | Action | Bases |
|---|---|---|
| A. | Perform a GP-3 shutdown | Degraded ability to flood reactor to 2/3 core height |
| B. | Perform a GP-3 shutdown | Ensure adequate core flow coastdown following a LOCA |
| C. | Perform a GP-4 shutdown | Degraded ability to flood reactor to 2/3 core height |
| D. | Perform a GP-4 shutdown | Ensure adequate core flow coastdown following a LOCA |

Answer: A

**Answer Explanation**

| | |
|---|---|
| **ANSWER (A)** | **Perform a GP-3 shutdown, Degraded ability to flood reactor to 2/3 core height; Correct:** With an identified Jet Pump failure, ON-100 is very clear that a GP-3 shutdown must be commenced.<br><br>Tech spec bases 3.4.1 states:<br><br>*An inoperable jet pump is not, in itself, a sufficient reason to declare a recirculation loop inoperable, but it does, in case of a design-basis-accident, increase the blowdown area and reduce the capability of reflooding the core; thus, the requirement for shutdown of the facility with a jet pump inoperable.* |
| **DISTRACTOR (B)** | **Perform a GP-3 shutdown, Ensure adequate core flow coastdown following a LOCA; Wrong:** Adequate flow coastdown is plausible based on the mismatch spec requirement from 3.4.1.3 and TS bases. However, the mismatch is not the cause but a symptom. |
| **DISTRACTOR (C)** | **Perform a GP-4 shutdown, Degraded ability to flood reactor to 2/3 core height; Wrong:** Plausible to the candidate who recalls the requirement to shutdown in ON-100 but cannot recall that GP-3 shutdown is required not GP-4 |
| **DISTRACTOR (D)** | **Perform a GP-4 shutdown, Ensure adequate core flow coastdown following a LOCA; Wrong:** Plausible to the candidate who recalls the requirement to shutdown in ON-100 but cannot recall that GP-3 shutdown is required not GP-4. Part two is plausible based on the mismatch spec requirement from 3.4.1.3 and TS bases. However, the mismatch is not the cause but a symptom. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2201886 |
| User-Defined ID: | Q #91 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO Only Failed Jet Pump |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 2 |
| **Group** | 2 |
| **KA # and Rating** | 202001 A2.01<br>3.9 |
| **KA Statement** | Recirculation; Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Jet pump failure: Plant-Specific |
| **Cognitive level** | High |
| **Safety Function** | 1 |
| **10 CFR 55** | 43.5, 43.7 |
| **Technical Reference with Revision No:** | ON-100 Rev. 008<br>TS Basis 3.4.1 Amend 236 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0043A.12 |

**92** **ID: 2202575** **Points: 1.00**

**********SRO ONLY**********

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

- RPIS INOP 108-E-5, RPIS INOP is received
- Position indication lost for approximately one third (1/3) of the control rods

- An EO sent to investigate reports that 1 of the 3 RPIS power supplies has failed

Given: IC-11-00730, "Determining Control Rod Position Using the Rod Position Analyzer"
ST-6-107-361-1, "Inoperable Rod Position Indication Actions"

Which one of the following describes the method to determine rod position AND the time limit to perform those required actions?

| | Method to Determine Position | Time Limit |
|---|---|---|
| A. | Perform ST-6-107-361-1 | Determine the position of the affected rods within 1 hour |
| B. | Perform ST-6-107-361-1 | Determine the position of the affected rods within 12 hours |
| C. | I&C Perform IC-11-00730 | Determine the position of the affected rods within 1 hour |
| D. | I&C Perform IC-11-00730 | Determine the position of the affected rods within 12 hours |

Answer: D

**Answer Explanation**

From ON-127 Section 4.0 Discussion:

4.1 On a loss of an RPIS power supply, the affected control rods' indication on the full core display is not functional. The only means to verify rod position for control rods that have lost power to RPIS is using IC-11-00730, "Determining Control Rod Position Using the Rod Position Analyzer". If the failure mechanism for the RPIS Inoperative alarm is a loss of a power supply, the 1 hour action for per T.S. 3.1.3.7 cannot be met. IC-11-00730 must be completed within 12 hours, otherwise the reactor must placed in Hot Shutdown IAW T.S. 3.1.3.7.

| | |
|---|---|
| **ANSWER (D)** | **I&C Perform IC-11-00730, Determine the position of the affected rods within 12 hours; Correct:** A single power failure to the RPIS will cause indications to be lost to approximately 1/3 of the core. The full core display will not update the affected rods and the 4 rod display will be inoperative for those rods. Only the IC procedure will be effective in determining position. It is not feasible to perform the IC-11-00730 procedure in under 1 hour for multiple control rods so the 12 hour time limit in the otherwise statement of TS 3.1.3.7 applies. |
| **DISTRACTOR (A)** | **Perform ST-6-107-361-1, Determine the position of the affected rods within 1 hour; Wrong**; Plausible to the candidate who recalls that ST-6-107-361-1 is used to determine position of rods within 1 hour when rod movement can be used to obtain a valid indication per TS 3.1.3.7. With a loss of RPIS power, the Full Core Display and 4 rod display are inoperable for those rods. The actions directed from the ST would be ineffective. The second part is plausible if the candidate recalls the action from TS3.1.3.7a which provides an hour to determine rod position. As noted above, it would not be plausible to complete that task in 1 hour and the discussion in ON-127 directly addresses this concern. |
| **DISTRACTOR (B)** | **Perform ST-6-107-361-1, Determine the position of the affected rods within 12 hours; Wrong**; Plausible to the candidate who recalls that ST-6-107-361-1 is used to determine position of rods within 1 hour when rod movement can be used to obtain a valid indication per TS 3.1.3.7. With a loss of RPIS power, the Full Core Display and 4 rod display are inoperable for those rods. The actions directed from the ST would be ineffective. |
| **DISTRACTOR (C)** | **I&C Perform IC-11-00730, Determine the position of the affected rods within 1 hour; Wrong;** The second part is plausible if the candidate recalls the action from TS3.1.3.7a which provides an hour to determine rod position. As noted above, it would not be feasible to complete that task in 1 hour and the discussion in ON-127 directly addresses this concern. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **Question 92 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 |
| | |
| System ID: | 2202575 |
| User-Defined ID: | Q #92 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO Only - RPIS INOP Power Supply |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 2 |
| **Group** | 2 |
| **KA # and Rating** | 214000 G 2.1.7<br>4.7 |
| **KA Statement** | Rod Position Information; Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation |
| **Cognitive level** | High |
| **Safety Function** | 7 |
| **10 CFR 55** | 43.5 |
| **Technical Reference with Revision No:** | ON-127 Rev 001<br>TS 3.1.3.7 Amend 169 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History: Revision History:** | |
| **Training Objective** | LGSOPS0073A.04B |

**93** **ID: 2167255** **Points: 1.00**

************SRO ONLY************

Unit 1 is in OPCON 1.

Technicians determine that the following heat detector is non-functional (does not work):

- Heat Detector HD-247-2
- Located in Unit 1 RCIC Pump Room, Rx Enclosure El. 177 ft.

WHICH ONE of the following:

(1) identifies the TRM action required for the failed detector, and

(2) identifies whether or not a TRM 3.7.6.2 entry is required for an automatic sprinkler/spray system affected by the failed detector?

A. (1) Restore to Operable within 14 days
(2) Yes, a TRM entry is required for an effected fire suppression system

B. (1) Restore to Operable within 14 days
(2) No, a TRM entry is not required for an effected fire suppression system

C. (1) Establish an hourly fire watch within 1 hour of discovery
(2) Yes, a TRM entry is required for an effected fire suppression system

D. (1) Establish an hourly fire watch within 1 hour of discovery
(2) No, a TRM entry is not required for an effected fire suppression system

Answer: C

**Answer Explanation**

**ILT Provided reference(s):**

- **U/1 TRM 3.3.7.9**
- **U/1 TRM 3.7.6.2**

Part (1) refers to TRM LCO 3.3.7.9 (Fire Detection Instrumentation). This LCO statement clearly states that all of the detectors in a given fire zone shown on Table 3.3.7.9-1 must be OPERABLE. The specific question, here, is whether or not this fire zone is one that answers to this LCO. A review of that Table shows that the RCIC Pump Room 108, Unit 1 Rx.177', does in fact appear on the Table and is identified as Fire Zone 33. Since there are 3 heat detectors in the room, action a.2. applies since the affected detectors are heat not smoke and are part of function B. Therefore Establish an hourly fire watch within 1 hour is the correct answer.

Part (2) refers to TRM LCO 3.7.6.2 (Spray and/or Sprinkler Systems). This LCO statement lists the Fire Zones for which the spray and sprinkler systems must be OPERABLE. Notice that Fire Zone 33 is one of the listed zones. There is a cause-effect relationship between the failed heat detector and the sprinkler system in this Fire Zone. Reason is: Table 3.3.7.9-1 accounts for this heat detector under the column labeled "Heat x/y", and shows there are a total of 3 of these heat detectors in that zone. Notice how they are listed: 0/3. The meaning of the x/y notation is defined on the last page of the Table. We find that the "x" refers to the total number of detectors that provide only "Early Warning Fire Detection and Notification". Similarly, the "y" refers to the number of detectors that also provide "Activation of Fire Suppression Systems". Therefore, from the 0/3 listed on Table 3.3.7.9-1, we can conclude that this failed heat detector is required for that Fire Zone's sprinkler system.

| | |
|---|---|
| **ANSWER (C)** | **(1) Establish an hourly fire watch within 1 hour of discovery**<br>**(2) Yes, a TRM entry is required for an effected fire suppression system: Correct**, see explanation above |
| **DISTRACTOR (A)** | **(1) Restore to Operable within 14 days**<br>**(2) Yes, a TRM entry is required for an effected fire suppression system: Wrong:** Plausible to the candidate who incorrectly determines action a.1 applies and that more than half of the required detectors are available. However, heat detectors are function B as noted in the note at the bottom of the table and are not subject to action a.1. |
| **DISTRACTOR (B)** | **(1) Restore to Operable within 14 days**<br>**(2) No, a TRM entry is not required for an effected fire suppression system: Wrong:** . Plausible to the candidate who incorrectly determines action a.1 applies and that more than half of the required detectors are available and who does not identify that heat detectors are required to make the sprinkler system operable. |
| **DISTRACTOR (D)** | **(1) Establish an hourly fire watch within 1 hour of discovery**<br>**(2) No, a TRM entry is not required for an effected fire suppression system: Wrong:** . Plausible to the candidate who incorrectly determines that heat detectors are not a required input to the sprinkler system. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167255 |
| User-Defined ID: | Q #93 NEW REF |
| Cross Reference Number: | OPEN |
| | |
| Topic: | (SRO ONLY) - Recognize TRM Entry for Fire Detection/Suppression |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | U/1 TRM 3.3.7.9 pg 3-92 to 3-96<br>U/1 TRM 3.7.6.2 pg. 7-22 to 7-23 |
| **K/A Justification** | None |
| **SRO-Only Justification** | |
| **Additional Information** | None |

| General Data | | | |
|---|---|---|---|
| **Level** | SRO | | |
| **Tier** | 2 | | |
| **Group** | 2 | | |
| **KA # and Rating** | 286000 G 2.2.38 | | |
| **KA Statement** | Fire Protection; Knowledge of conditions and limitations in the facility license. | | |
| **Cognitive level** | High | | |
| **Safety Function** | 8 - Plant Services | | |
| **10 CFR 55** | 43.3 | | |
| **Technical Reference with Revision No:** | U/1 TRM 3.3.7.9<br>U/1 TRM 3.7.6.2<br>ARC-MCR-006, I3U | **Rev #:** | 5<br>3<br>4<br>4<br>0<br>0<br>7 |
| **Question History: (i.e. LGS NRC-05)** | New | | |
| **Question Type: (New, Bank, Modified)** | New | | |
| **Revision History:** | | | |
| **Training Objective** | LGSOPS0022.013A | | |

U/1 TRM 3.3.7.9
U/1 TRM 3.7.6.2

**94** **ID: 2201897** **Points: 1.00**

**********SRO ONLY**********

Which of the following individuals is responsible for reviewing and/or approving a planned Reactivity Maneuver Approval (ReMA)?

1. Reactivity Management SRO (RMSRO)
2. Qualified Nuclear Engineer (QNE)
3. Reactor Engineering Manager

A. 1 only

B. 1 and 2 only

C. 2 and 3 only

D. 1, 2 and 3

Answer: D

**Answer Explanation**

from OP-AB-300-1003:

3.5. Operations Staff – A designated Senior Reactor Operator (SRO) provides a review and authorization of a ReMA Package and any revisions to Attachment 1 and/or Attachment 2.

3.5.1. Reference OP-AA-101-111 for responsibilities of the Reactivity Management SRO (RMSRO) during Reactivity Maneuvers.

3.8. Qualified Nuclear Engineer (QNE) – is responsible for independently reviewing the ReMA Package. **If** a QNE prepares the ReMA, **then** a second QNE must review th ReMA Package.

3.10. Reactor Engineering Manager (REM) **–** The Reactor Engineering Manager (or designee) is responsible for providing oversight, direction **and** approval of the activities described in this procedure. The Reactor Engineering Manager ensures that Reactor Engineering personnel involved in a maneuver have been briefed on the ReMA Package and any special guidance prior to participating in a maneuver.

From OP-AA-101-111:

4.6. Reactivity Management Senior Reactor Operator (RMSRO)

4.6.4. **REVIEWS** or **APPROVE** all planned reactivity changes in accordance with approved procedures or instructions developed by Reactor Engineering and communicated on the REMA Form.

| | |
|---|---|
| **ANSWER (D)** | **1, 2 and 3; Correct:** Per procedure OP-AB-300-1003, all three individuals are responsible to approve the REMA. |
| **DISTRACTOR (A)** | **1 only; Wrong:** Plausible to the SRO candidate who is unfamiliar with the requirements and only knows the SRO role |
| **DISTRACTOR (B)** | **1 and 2 only; Wrong:** Plausible to the candidate who recognizes that the QNE and the RMSRO have a role in approval but does not recall the RE Mgr approval. |
| **DISTRACTOR (C)** | **2 and 3 only; Wrong:** Plausible to the candidate who assumes that REMAs are a product purely of Rx Eng. with no OPS involvement. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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: | 0.00 |
| | |
| System ID: | 2201897 |
| User-Defined ID: | Q #94 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | (SRO Only) Reactivity Maneuver |
| Num Field 1: | LM |
| Num Field 2: | SRO- Low |
| Text Field: | ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.1.37<br>4.6 |
| **KA Statement** | Knowledge of procedures, guidelines, or limitations associated with reactivity management. |
| **Cognitive level** | Low |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 43.6 |
| **Technical Reference with Revision No:** | OP-AB-300-1003 Rev 018<br>OP-AA-101-111 Rev.012 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS2010.12c |

**95** **ID: 2167260** **Points: 1.00**

**********SRO ONLY**********

Which of the following refuel activities REQUIRES a Licensed SRO to DIRECTLY supervise per GP-6.1, "Shutdown Operations - Refueling, Core Alteration and Core Off- Loading?

1. Withdrawal of fuel from the vessel
2. Replacement of SRMs and IRMs
3. Insertion of a special test source into the vessel

A. 1 and 2 ONLY

B. 1 and 3 ONLY

C. 2 and 3 ONLY

D. 1, 2 and 3

Answer: B

**Answer Explanation**

T.S. Def. 1.7: CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:

a) Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special moveable detectors (including under vessel replacement); and

b) Control rod movement, provided there are no fuel assemblies in the associated core cell.

A special test source would be considered a core alt.

T.S. 6.2.2.d states: "ALL CORE ALTERATIONS shall be observed and directly supervised by either a licensed Senior Operator or licensed Senior Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation."

| | |
|---|---|
| **ANSWER (B)** | **1 and 3 ONLY; Correct:** From the Tech specs referenced above, Senior Licensed operators must supervise Core Alts and core alts include the movement of fuel and rods in fueled cells as well as sources placed into the core. Only 1 and 3 above meet the definition |
| **DISTRACTOR (A)** | **1 and 2 ONLY; Wrong:** Plausible to the candidate who recalls that 1 is a core alt and who recalls that Nuclear Instruments are required to be operable for Core Alts to occur but who fails to recall that SRM and IRM movements are not Core Alts per the Definition above. Also, the candidate has failed to include 3 as a core alt. . |
| **DISTRACTOR (C)** | **2 and 3 ONLY; Wrong:** Plausible to the candidate who recalls that 3 is a core alt and who recalls that Nuclear Instruments are required to be operable for Core Alts to occur but who fails to recall that SRM and IRM movements are not Core Alts per the Definition above. Also, the candidate has failed to include 1 as a core alt |
| **DISTRACTOR (D)** | **1, 2 and 3; Wrong:** Plausible to the candidate who recalls that Nuclear Instruments are required to be operable for Core Alts to occur but who fails to recall that SRM and IRM movements are not Core Alts per the Definition above. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| 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 |
| System ID: | 2167260 |
| User-Defined ID: | Q #95 BANK |
| Cross Reference Number: | CLOSED |
| Topic: | SRO Only - Core Alterations |
| Num Field 1: | LM |
| Num Field 2: | SRO-LOW |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.1.40 3.9 |
| **KA Statement** | Knowledge of refueling administrative requirements |
| **Cognitive level** | Low |
| **Safety Function** | 1 - Reactivity Control |
| **10 CFR 55** | 43.6 |
| **Technical Reference with Revision No:** | LGS Tech Spec 1.7 Rev. 227<br>LGS Tech Spec 6.2.2 Rev. 198<br>GP-6.1 Rev. 043 |
| **Question History: (i.e. LGS NRC-05)** | Oyster Creek 2010 ILT #98 |
| **Question Type: (New, Bank, Modified)** | Bank |
| **Revision History:** | |
| **Training Objective** | LGSOPS2010.12 |

**96** **ID: 2167356** **Points: 1.00**

**********SRO ONLY*********

Consider the requirements of CC-AA-112, "Temporary Configuration Changes."

WHICH ONE of the following activities requires a Temporary Configuration Change Package per CC-AA-112?

A. Freeze Seals

B. Scaffolding installed above an operating Reactor Feed Pump

C. Non-safety related relief valve that is mechanically gagged to stop its leakage

D. Temporary lead shielding installed around a main steam line drain valve to support nearby maintenance

Answer: C

**Answer Explanation**

Refer to CC-AA-112: section 2.3 defines "Controlled Exclusions" as temporary changes controlled in a manner OTHER THAN by using a TCCP; section 4.2.1 lists some "controlled exclusions", including...temporary lead shielding and scaffolding; section 4.2.12 lists activities that are NOT considered to be "controlled exclusions"...this includes installed scaffolding when it is attached to a plant system/component, and also includes a "gagged or disabled relief valve".

**ANSWER: Non-safety related relief valve that is mechanically gagged to stop its leakage**

| | |
|---|---|
| **ANSWER (C)** | **Non-safety related relief valve that is mechanically gagged to stop its leakage; Correct:** As noted above, the list of controlled exclusions does not include gagging safety relief valves. All other choices are on the exclusion list. |
| **DISTRACTOR (A)** | **Freeze Seals; Wrong:** Plausible to the candidate who is not familiar with the exclusions in CC-AA-112. Freeze Seals are an exclusion per step 4.2.1 |
| **DISTRACTOR (B)** | **Scaffolding installed above an operating Reactor Feed Pump; Wrong:** Plausible to the candidate who is not familiar with the exclusions in CC-AA-112. Scaffolding is an exclusion per step 4.2.1 |
| **DISTRACTOR (D)** | **Temporary lead shielding installed around a main steam line drain valve to support nearby maintenance; Wrong:** Plausible to the candidate who is not familiar with the exclusions in CC-AA-112. Temporary Lead Shielding is an exclusion per step 4.2.1 |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167356 |
| User-Defined ID: | Q #96 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO ONLY - Recognize an alteration that requires Temporary Config Change controls |
| Num Field 1: | LM |
| Num Field 2: | SRO-LOW |
| Text Field: | LO-ILT |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 3 |
| **Group** | |
| **KA # and Rating** | G 2.2.11<br>3.3 |
| **KA Statement** | Knowledge of the process for controlling temporary design changes |
| **Cognitive level** | Low |
| **Safety Function** | |
| **10 CFR 55** | 43.3 |
| **Technical Reference with Revision No:** | CC-AA-112 Rev. 029 |
| **Question History: (i.e. LGS NRC-05)** | |
| **Question Type: (New, Bank, Modified)** | Bank(985683) |
| **Revision History:** | |
| **Training Objective** | LGSOPS2005.18A |

**97** **ID: 2168716** **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

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2168716 |
| User-Defined ID: | Q #97 NEW |
| 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 a Tier 3 K/A because the question is testing the candidates knowledge of TRM general LCO applicability. The specific system involved is not important to know, the candidate must know that TRM LCO 3.0.5 allows P.M. testing without taking additional actions. |
| **SRO-Only Justification** | N/A |
| **Additional Information** | N/A |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 3 |
| **Group** | |
| **KA # and Rating** | G2.2.21 4.1 |
| **KA Statement** | 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 3.0.5 Rev.064<br>TRM 3.3.7.8.2 Rev.068 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS1700.06 |

**98** **ID: 2168717** **Points: 1.00**

************ SRO ONLY ************

LGS has declared a GENERAL EMERGENCY.

Command & Control has been transferred to the TSC.

Consider the following ERO personnel:

1. Shift Manager / Shift Emergency Director
2. Radiation Protection Manager
3. Station Emergency Director

WHICH ONE of the following identifies (from the above list) **ALL** of those who can **APPROVE** an "Authorization for Emergency Exposure" form for a worker to receive exposure greater than 25 Rem TEDE?

A. 1 only

B. 1 and 2 only

C. 2 and 3 only

D. 3 only

Answer: D

**Answer Explanation**

Refer to EP-AA-113-F-02 (Authorization for Emergency Exposure). The Shift Manager / Shift Emergency Director may approve prior to transferring Command and Control to the Station Emergency Director. After the transfer of command and control, only the Station Emergency Director can approve the emergency exposure.

| | |
|---|---|
| **ANSWER (D)** | **3 Only; Correct:** Correct for the reasons described above. |
| **DISTRACTOR (A)** | **1 Only; Wrong:** Plausible to the candidate who recognizes that the Shift Manager is always the initial "Emergency Director" and so believes that he/she still approves the exposure even after transferring command and control |
| **DISTRACTOR (B)** | **1 and 2 Only; Wrong:** Plausible to the candidate who recognizes that the Shift Manager is always the initial "Emergency Director" and so believes that he/she still approves the exposure even after transferring command and control and plausible to the candidate who believes that since the RPM approves Admin limit extensions they also can approve emergency exposures. |
| **DISTRACTOR (C)** | **2 and 3 Only; Wrong:** Plausible to the candidate who believes that since the RPM approves Admin limit extensions they also can approve emergency exposures |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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: | 2.00 |
| | |
| System ID: | 2168717 |
| User-Defined ID: | Q #98 BANK |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | (SRO) Recall who can Approve an Emergency Exposure request |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-I |

Comments:

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

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 3 |
| **Group** | n/a |
| **KA # and Rating** | 2.3.13 3.8 |
| **KA Statement** | Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc |
| **Cognitive level** | high |
| **Safety Function** | n/a |
| **10 CFR 55** | 43.4 |
| **Technical Reference with Revision No:** | EP-AA-113<br>RP-AA |
| **Question History: (i.e. LGS NRC-05)** | 1685033 2015 NRC |
| **Question Type: (New, Bank, Modified)** | Bank |
| **Revision History:** | |
| **Training Objective** | LGSOPS |

**99** **ID: 2167378** **Points: 1.00**

************SRO ONLY************

A Site Area Emergency is declared at LGS and the TSC cannot be staffed due to hazardous travel conditions.

The EOF is fully staffed and is ready to assume command and control function.

Per EP-AA-112-F-01, "Command and Control Turnover Briefing Form", which of the following responsibilities are retained by the shift emergency director and what is the time limit to inform the NRC of the Emergency declaration?

| | SED Responsibilities | Time to Inform NRC |
|---|---|---|
| A. | State and local notifications | 60 minutes |
| B. | State and local notifications | 15 minutes |
| C. | Event Classification | 60 minutes |
| D. | Event Classification | 15 minutes |

Answer: C

**Answer Explanation**

Per EP-AA-112-F-01

5. Command and Control, of the following functions will be performed by:
   - a. Event Classification ..... ❑ CR ❑ TSC
   - b. NRC Notifications ..... ❑ CR ❑ TSC
   - c. Emergency Exposure Controls ..... ❑ CR ❑ TSC
   - d. PAR Decision-Making ..... ❑ CR ❑ EOF
   - e. State/Local Notifications ..... ❑ CR ❑ EOF

From EP-AA-112-100-F-01 Step 1.3.J:

J. **DIRECT** performance of required NRC notifications immediately following notification of the appropriate State and local agencies but **not** later than (1) hour after the time of classification per the Notifications procedure.

| | |
|---|---|
| **ANSWER (C)** | **Event Classification, 60 minutes; Correct:** Based on the conditions given, an emergency with travel conditions preventing the staffing of the TSC, therefore command and control will to be transferred directly to the EOF. However, the EOF does not perform Event classification. Therefore per EP-AA-112-F-01, this task remains with the Shift ED. Also, the NRC is required to be notified within 60 minutes. |
| **DISTRACTOR (A)** | **State and local notifications, 60 minutes; Wrong:** Plausible to the candidate who recalls that Event classification normally goes to the TSC and assumes that this function travels to the EOF and who recalls that the State and Local notifications are performed using EONs software from the control room and assumes that would remain the case. |
| **DISTRACTOR (B)** | **State and local notifications, 15 minutes; Wrong:** Plausible to the candidate who recalls that Event classification normally goes to the TSC and assumes that this function travels to the EOF and who recalls that the State and Local notifications are performed using EONs software from the control room and assumes that would remain the case. Also plausible if they recall that state and local notifications are required in 15 minutes and NRC notification is required in 15 minutes for security events. |
| **DISTRACTOR (D)** | **Event Classification, 15 minutes; Wrong:** Plausible to the candidate who recalls that state and local notifications are required in 15 minutes and NRC notification is required in 15 minutes for security events. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167378 |
| User-Defined ID: | Q #99 NEW |
| Cross Reference Number: | CLOSED |
| | |
| Topic: | SRO Only - EP implementation |
| Num Field 1: | LM |
| Num Field 2: | SRO-LOW |
| Text Field: | LO-ILT |

Comments:

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

| General Data | | |
|---|---|---|
| **Level** | SRO | |
| **Tier** | 3 | |
| **Group** | | |
| **KA # and Rating** | 2.4.38 | 4.4 |
| **KA Statement** | Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. | |
| **Cognitive level** | Low | |
| **Safety Function** | | |
| **10 CFR 55** | 43.5 | |
| **Technical Reference with Revision No:** | EP-AA-112-F-01 | Rev. H |
| **Question History: (i.e. LGS NRC-05)** | | |
| **Question Type: (New, Bank, Modified)** | New | |
| **Revision History:** | New | |
| **Training Objective** | | |

**100** **ID: 2167417** **Points: 1.00**

**********SRO ONLY**********

Unit 1 LOCA is in progress following operation at 100%:

- A protest is in progress at the entrance to the access road
- A General Emergency has been declared per FG1
- No turnover of command and control has taken place
- No previous notifications have been made
- Post LOCA Rad Monitors are steady at 3345 R/Hr

- Wind direction is from 236°

WHICH ONE of the following identifies the required PAR?

A. Shelter 5 mile radius

B. Evacuate 2 mile Radius and Evacuate 2-5 miles in sectors A / B / C / D / E

C. Shelter 2 mile Radius and Shelter 2 - 5 miles in sectors A / B / C / D / E

D. Evacuate 2 mile Radius and Evacuate 2-5 miles in sectors A / B / C / D / E and Shelter 5-10 miles in sectors A / B / C / D / E

Answer: B

**Answer Explanation**

From the stem conditions, there is a protest which does not constitute a hostile action so NO Hostile Action Event in progress. There are NO impediments to evacuation and MCR has not been evacuated. The stem also indicates that this is an initial PAR (no previous notifications made) and that it is being made from the MCR (command and control has not been turned over). Refer to EP-AA-111-F-11 PAR Flowchart. A General Emergency has been declared out of Fission Product Barrier Matrix (FG1), therefore a PAR is required.

Per The Fission Product Barrier Matrix, Primary Containment is lost or potentially lost; however, the conditions for EAL RG1 have not been given to the candidate they should therefore not assume it is met Post LOCA Rad is 3345 R/Hr which is below the threshold for Rapid progression. Therefore the answer is **Evacuate 2 mile Radius and Evacuate 2-5 miles in** in sectors A / B / C / D / E.

| | |
|---|---|
| **ANSWER (B)** | **Evacuate 2 mile Radius and Evacuate 2-5 miles in sectors A / B / C / D / E; Correct:** As described above |
| **DISTRACTOR (A)** | **Shelter 5 mile radius; Wrong:** Plausible to the candidate who determines that a hostile action event is in progress |
| **DISTRACTOR (C)** | **Shelter 2 mile Radius and Shelter 2 - 5 miles in sectors A / B / C / D / E; Wrong:** Plausible to the student who determines that sheltering is required due to failed containment This is not correct. To get to that leg of the PAR flowchart, the PAR would have to come from the TSC. The option for sheltering is only for non-MCR PARS |
| **DISTRACTOR (D)** | **Evacuate 2 mile Radius and Evacuate 2-5 miles in sectors A / B / C / D / E and Shelter 5-10 miles in sectors...; Wrong:** Plausible to the student who determines that this is a rapidly progressing severe accident based on containment rad reading. This would be due to a mis-interpretation of the value in the flow chart. The requirement is 2.36E+04 R/Hr which is actually 23600 R/Hr. therefore, the conditions for rapidly progressing severe accident not met.. |

# Test Answer Key

LGS ILT 20-1 NRC SRO Exam
Test ID: 346747

| **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 |
| | |
| System ID: | 2167417 |
| User-Defined ID: | Q #100 NEW |
| Cross Reference Number: | OPEN |
| | |
| Topic: | SRO ONLY - Determine PAR |
| Num Field 1: | LM |
| Num Field 2: | SRO-HIGH |
| Text Field: | LO-ILT |

Comments:

| | |
|---|---|
| **References Provided** | EP-AA-111-F-11 page 1 through 4 |
| **K/A Justification** | None |
| **SRO-Only Justification** | N/A |
| **Additional Information** | None |

| General Data | |
|---|---|
| **Level** | SRO |
| **Tier** | 3 |
| **Group** | N/A |
| **KA # and Rating** | 2.4.44 4.4 |
| **KA Statement** | Knowledge of emergency plan protective action recommendations |
| **Cognitive level** | High |
| **Safety Function** | N/A |
| **10 CFR 55** | 43.5 |
| **Technical Reference with Revision No:** | EP-AA-111-F-11 Rev. D<br>EP-AA-1008 Add 3 Rev 5 |
| **Question History: (i.e. LGS NRC-05)** | New |
| **Question Type: (New, Bank, Modified)** | New |
| **Revision History:** | |
| **Training Objective** | LGSOPS0051.25 |