

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 1 Info | | | |
|--------------------------|---|-----------------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 5 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23045 | | |
| User-Defined ID: | 23045 | | |
| Cross Reference Number: | NLSRO0655.02 | | |
| Topic: | LGS Refuel platform power supply | | |
| RO value: | RO 3.1 | | |
| SRO Value: | SRO 3.2 | | |
| KA Reference: | 295003 AK1.04 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-1, OS93.1.A (COL) S97.0.M | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.8 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | N/A | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

**** COMMON ****

PECO Nuclear
LIMERICK GENERATING STATION

OS93.1.A (COL) EQUIPMENT ALIGNMENT FOR 480 VAC NON-SAFEGUARD
BUS BREAKERS

Check off List Header Sheet - Page 1

PURPOSE

To describe steps necessary to supply 480 VAC Non-Safeguard Load Centers and Motor Control Centers from their preferred sources. This includes Non-Safeguard MCC's supplied from safeguard buses.

LABELING SATISFACTORY: YES NO (If NO complete the following and forward copy to Operations Support Engineer).

| STEP | REMARKS |
|-------|---------|
| ----- | ----- |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

COMMENTS: _____

LIMERICK GENERATING STATION

| STEP | FEED/PANEL | APPARATUS DESCRIPTION | NUMBER | LOCATION | POSITION | TAG OK? y/n | BY | DATE |
|------|---------------|--|----------------------|-------------|----------|-------------------|----|------|
| 1. | 10C654 | 234D BUS BKR (234D) | 52-54842/CS | MCR | CLSD | | | |
| 2. | 10C654 | 134D-234D TIE BKR | 52-54732/CS | MCR | OPN | | | |
| 3. | 10C654 | 134D BUS BKR (134D) | 52-54722/CS | MCR | CLSD | | | |
| 4. | 10C654 | 224D BUS BKR (224D) | 52-30482/CS | MCR | CLSD | | | |
| 5. | 10C654 | 124D-224D TIE BKR | 52-30252/CS | MCR | OPN | | | |
| 6. | 10C654 | 124D BUS BKR (124D) | 52-30222/CS | MCR | CLSD | | | |
| 7. | 20C654 | 214D BUS BKR (214D) | 52-10982/CS | MCR | CLSD | | | |
| 8. | 20C654 | 114D-214D TIE BKR | 52-10752/CS | MCR | OPN | | | |
| 9. | 20C654 | 114D BUS BKR (114D) | 52-10722/CS (UNIT 1) | MCR | CLSD | | | |
| 10. | 144D/244D BUS | 144D BUS BKR. 52-55022 | 144D-22 | 106-TSC-217 | CLSD | | | |
| 11. | 144D/244D BUS | 144D-244D TIE BKR 52-55032 | 144D-32 | 106-TSC-217 | OPN | | | |
| 12. | 144D/244D BUS | 244D BUS BKR 52-55142 | 244D-42 | 106-TSC-216 | CLSD | | | |
| 13. | 1AC661 | D114-G-D MCC BKR. CONTROL STA. (SAFEGUARDS A) | 52-20124/CS (UNIT 1) | MCR | CLSD | | | |
| 14. | 1BC661 | D124-G-D MCC BKR. CONTROL STA. (SAFEGUARDS B) | 52-20224/CS (UNIT 1) | MCR | CLSD | | | |
| 15. | 10C654 | 114A BUS BKR (114A) | 52-10122/CS (UNIT 1) | MCR | CLSD | | | |
| 16. | 10C654 | 114A-124A TIE BKR | 52-10142/CS (UNIT 1) | MCR | OPN | | | |
| 17. | 10C654 | 124A BUS BKR (124A) | 52-10262/CS (UNIT 1) | MCR | CLSD | | | |
| 18. | 10C654 | 114B BUS BKR. (114B) | 52-10322/CS (UNIT 1) | MCR | CLSD | | | |
| 19. | 10C654 | 114B-124B TIE BKR | 52-10342/CS (UNIT 1) | MCR | OPN | | | |
| 20. | 10C654 | 124B BUS BKR (124B) | 52-10462/CS (UNIT 1) | MCR | CLSD | | | |
| 21. | 10C654 | 114C BUS BKR (114C) | 52-10522/CS (UNIT 1) | MCR | CLSD | | | |
| 22. | 10C654 | 114C-124C TIE BKR | 52-10542/CS (UNIT 1) | MCR | OPN | | | |

LIMERICK GENERATING STATION

| STEP | FEED/PANEL | APPARATUS DESCRIPTION | NUMBER | LOCATION | POSITION | TAG OK? y/n | BY | DATE |
|------|------------|-----------------------|----------------------|----------|----------|-------------------|----|------|
| 23. | 10C654 | 124C BUS BKR (124C) | 52-10662/CS (UNIT 1) | MCR | CLSD | | | |
| 24. | | END | | | | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

2 ID: 23088 Points: 1.00

PBAPS Unit 3 is in a refueling outage with plant conditions are as follows:

- Core Shuffle Part 1 is in progress
- The '3A' Loop of RHR is in Shutdown Cooling
- Reactor Cavity Water Temperature is 110°F and steady

The in-service RHR Heat Exchanger experiences severe fouling (High Pressure Service Water flow restrictions).

WHICH ONE of the following describes the change in the Wide Range Neutron Monitor (WRNM) indications **AND** the amount of DECAY HEAT generated by the Core?

| <u>WRNM Indication</u> | <u>Core Decay Heat Generation</u> |
|------------------------|-----------------------------------|
| A. Up | Up |
| B. Up | Remain the same |
| C. Down | Up |
| D. Down | Remain the same |

Answer: D

Answer Explanation:

D (Down /Remain the same) is correct because the fouled HX will result in a higher Cavity water temperature which will add negative reactivity a lower indication on the WRNMs. The decay heat will NOT change due to the change in temperature of the water.

A (up/up) is wrong because the WRNMs indication will go down with the rise in water temperature AND because the Decay heat rate will NOT go up.

B (up/remains the same) is wrong because the WRNMs indication will go down with the rise in water temperature

C (down / up) is wrong because the Decay Heat Rate will NOT go up. The Decay Heat rate is dependent on power history and time from shutdown. Therefore, Decay Heat will NOT change due to water temperature. NOTE – If time from HX fouling is considered, then over time the Decay Heat rate does go down.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23088 | | |
| User-Defined ID: | 23088 | | |
| Cross Reference Number: | BR04O-1 / 295023-3 | | |
| Topic: | Heat exchanger fouling results in what change in thermal neutron population | | |
| RO value: | 3.9 | | |
| SRO Value: | 3.9 | | |
| KA Reference: | 295014 AK2.07 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | Generic Fundamentals | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (if appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 1 | |

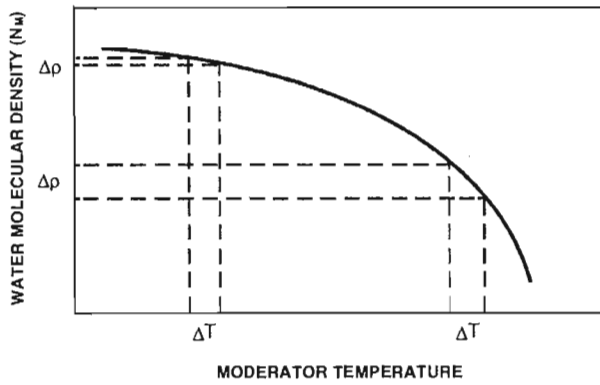


Figure 4-1 Moderator Temperature and Density Changes

This results in the magnitude of the moderator temperature coefficient being larger (more negative) at higher temperatures. The moderator temperature coefficient for a one degree change at a high temperature (499 to 500°F) is more negative than the moderator temperature coefficient at a low temperature (99 to 100°F).

Since reactivity is defined in terms of the effective multiplication factor (k_{eff}) it is necessary to examine how moderator temperature changes affect the effective multiplication factor or the six factors. Recall:

$$k_{eff} = \epsilon L_f p L_{th} f \eta$$

Equation 4-3

We have shown that an increase in moderator temperature results in a decrease in water density. This causes an accompanying increase in slowing down and thermal diffusion lengths because the moderator atoms are farther apart, requiring neutrons to travel farther between collisions.

Increasing the slowing down length increases the probability that a neutron can reach the fuel while still at resonance energy. Since the slowing down length increases, the slowing down time also increases. Thus, neutrons spend more time at resonance energy levels. Reducing

the probability of a neutron escaping resonance capture decreases the resonance escape probability (p). The plot for p shows this effect in Figure 4-2.

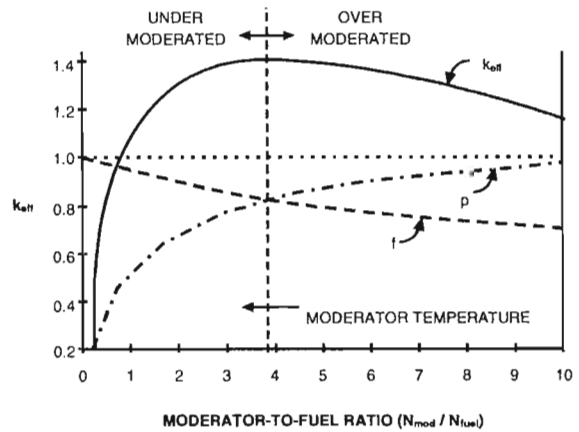


Figure 4-2 k_{eff} vs. Moderator-to-Fuel Ratio

A decrease in the moderator density also causes the thermal neutron absorption in the moderator to decrease due to fewer moderator atoms in the core area. This increases the probability of thermal neutron absorption in the fuel. In addition, the thermal utilization factor (f) slightly increases (Figure 4-2).

Recall from Chapter 2 the equation:

$$f = \frac{\Sigma_a^{fuel}}{\Sigma_a^{fuel} + \Sigma_a^{mod} + \Sigma_a^{other}}$$

Equation 4-4

This can be rewritten as:

$$f = \frac{\sigma_a^{fuel}}{\sigma_a^{fuel} + \frac{N_{mod}}{N_{fuel}} (\sigma_a^{mod}) + \frac{N_{other}}{N_{fuel}} (\sigma_a^{other})}$$

Equation 4-5

As the temperature increases, the concentration of moderator atoms (N_{mod}) decreases; therefore, the thermal utilization factor increases.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

3 ID: 23114 Points: 1.00

PBAPS Unit 2 plant conditions are as follows:

- A total core off-load has been completed
- The Reactor Cavity to Fuel Pool Gates are installed
- Reactor Cavity water level is +474" and steady
- The Spent Fuel Pool water temperature 95°F and steady
- The Reactor Building Closed Cooling Water (RBCCW) system is supplying cooling water to the Fuel Pool Cooling (FPC) Heat Exchangers in accordance with AO 35.1-2 'RBCCW Backup to FPC'

A transient causes the operating Unit 2 Drywell Chillers to lose electrical power (1T4 and 2T4 Load Centers de-energize).

WHICH ONE of the following describes the impact of the de-energized Load Centers on the plant? (Assume **NO** Operator action)

- A. Drywell is without cooling
- B. Fuel Pool Cooling Pump(s) will trip
- C. Reactor Cavity water level will lower
- D. Fuel Pool water temperature will rise

Answer: D

Answer Explanation:

D (Fuel Pool water temperature will rise) is correct because the PBAPS RBCCW system will automatically align to supply cooling water to the Drywell Chill Water System. This lineup will TAKE some RBCCW water away from the FPC HX which means that there will be less heat removal by the heat exchanger (and Fuel Pool water temperatures will go up).

A (Drywell is without cooling) is wrong because the RBCCW system will automatically align to the Drywell Chill Water system and therefore the Drywell will still have a source of cooling. NOTE - For Limerick Generating Station, this would be the correct answer because the RBCCW system will NOT automatically backup the Drywell Chill Water at Limerick (it is a manual action).

B (Fuel Pool Cooling Pumps will trip) is wrong because there is NO FPC Pump trip on loss of cooling water (NOTE - there is a trip on loss of Fuel Pool water).

C (Reactor Cavity water level will lower) is wrong because Reactor Cavity level will not be impacted by the RBCCW swap-over or the loss of the 1T4 and 2T4 Load Centers. The impact on level is plausible since the RBCCW back up of the Drywell Chill Water system will automatically cut off cooling to RWCU, however, without a source of heat (full core off-load), even without cooling water RWCU will NOT get a high temperature condition and therefore will NOT isolate. With no heat load and no isolation of the RWCU system, there will be change in the Reactor Cavity water level.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23114 | | |
| User-Defined ID: | 23114 | | |
| Cross Reference Number: | NLSRO5035-2 / 234000-45 | | |
| Topic: | PBAPS - Impact on an auto swap of RBCCW to supply Drywell Chill Water System | | |
| RO value: | 3.3 | | |
| SRO Value: | 3.4 | | |
| KA Reference: | 295018 AA1.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-316 sht 1 M-327 sht 2 E-154 sht 1 | Revision #:61 55 1 |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 8 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

4 ID: 23046 Points: 1.00

LGS Unit 1 plant conditions are as follows:

- Reactor Cavity water level is + 484" and steady
- "1A" RHR is in Shutdown Cooling
- "1B" RHRSW heat exchanger is out of service, and is not expected to be returned to service until 2100

At 1300 the following occurs:

- "1A" RHRSW HX inlet valve (HV-51-1F014B) fails closed and cannot be reopened

WHICH ONE of the following describes the required action?

- A. Immediately suspend handling of fuel assemblies or control rods within the RPV
- B. Verify reactor coolant circulation by an alternate method By 1400 today
- C. Verify the availability of ONE alternate method of decay heat removal by 1400 today
- D. Verify the availability of TWO alternate methods of decay heat removal by 1400 today

Answer: C

Answer Explanation:

Answer: Verify the availability of an alternate method of decay heat removal by 1400 today: Correct:

NOTE: The candidate must determine that cavity water level is greater than 22 feet above the top of the flange.

1A RHRSW HX inlet valve failing closed, INOPs the A loop of SDC. Per TECH SPECS 3.9.11.1: One RHR Shutdown Cooling subsystem shall be operable and in operation, or within 1 hr. and once per 24 hrs verify an alternate method of decay heat removal is available in OPCI 5 with reactor vessel water level greater than 22 feet above the flange (+484" is greater than 22 feet above the flange).

Distracters:

Immediately suspend handling of fuel assemblies or control rods within the RPV:

This is not correct, as cavity water level is greater than 22 feet above the flange, it would be correct if water level was less than 22 feet above the flange per T.S. 3.9.8.

Verify reactor coolant circulation by an alternate method By 1400: This is not correct as while there is a loss of decay heat removal, there is no loss of coolant circulation. It would be correct if there was a loss of coolant circulation.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

Verify the availability of TWO alternate methods of decay heat removal by 1400 today: This is not correct as Reactor cavity water level is greater than 22 feet above the flange. It would be correct if water level was less than 22 feet above the flange per T.S. 3.9.11.2

| 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: | 4.00 | |
| System ID: | 23046 | |
| User-Defined ID: | 23046 | |
| Cross Reference Number: | NLSRO1840.03 | |
| Topic: | Determine the required action for an RHR pump trip while in Shutdown Cooling | |
| RO value: | 3.4 (2.7) | |
| SRO Value: | 3.5 (2.7) | |
| KA Reference: | 295021 2.2.42 | |
| Comments: | General Data | |
| | Technical Reference with Revision Number: | T.S. 3.9.11.1 T.S 3.9.11.2 |
| | Cognitive Level | H |
| | PRA: (i.e. Yes or No or #) | Y |
| | 10CFR55.43 (n/a for RO) | 43.2, 43.3 |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS LORT BANK |
| | Question Source: (i.e. New, Bank, Modified) | Modified |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Q 561139, changed to OPCON 5 |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None |
| | Low KA Justification (if required): | N/A |
| | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

5 ID: 4503 Points: 3.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- An LPRM is being transported to the fuel pool per M-C-774-010 "LPRM / SRM, IRM WRNM Dry Tube Replacement" when ARM RIS-31-M1-1K600, on the Refuel Floor wall north of the Spent Fuel pool Alarms.
- The LPRM is immediately lowered
- The ARM Alarm clears

WHICH ONE of the following describes the purpose of the ARM and required action?

| | <u>ARM Purpose</u> | <u>Required Action</u> |
|----|--|---|
| A. | Isolate Refuel Floor Ventilation | Health Physics monitors dose rates Per M-C-774-010 |
| B. | Isolate Refuel Floor Ventilation | Evacuate the Fuel Floor Per ON-120 |
| C. | Detect Potential Criticality in The Fuel Pool | Health Physics monitors dose rates Per M-C-774-010 |
| D. | Detect Potential Criticality in The Fuel Pool | Evacuate the Fuel Floor Per ON-120 |

Answer: C

Answer Explanation:

ANSWER: Detect Potential Criticality in The fuel pool/Health Physics monitors dose rates: The ARM on the Wall North of the Spent Fuel Pool is one of three "CRITICALITY MONITORS". During Transport of an LPRM, the instrument is close to the surface of the water and may result in an ARM alarming. M-C-774-010 directs HP monitoring of dose rate during LPRM replacements and movements.

DISTRACTORS:

Isolate Refuel Floor Ventilation/Health Physics monitors dose rates: This is incorrect as a Refuel Floor Isolation is generated by Radiation detectors located in the Refuel exhaust ducts, not the noted ARM. This is partially correct as during Transport of an LPRM, the instrument is close to the surface of the water and may result in an ARM alarming. M-C-774-010 directs HP monitoring of dose rate during LPRM replacements and movements.

Isolate Refuel Floor Ventilation/Evacuate the Fuel Floor: This is incorrect as a Refuel Floor Isolation is generated by Radiation detectors located in the Refuel exhaust ducts, not the noted ARM. Additionally, an evacuation is NOT correct as ON-120 only requires a evacuation if a Fuel Floor Area Radiation Monitor alarms unplanned AND is not due to object handled near water surface which is immediately re submerged.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

Detect Potential Criticality in The fuel pool/Evacuate the Fuel Floor: This is incorrect as evacuation is NOT correct as ON-120 only requires a evacuation if a Fuel Floor Area Radiation Monitor alarms unplanned AND is not due to object handled near water surface which is immediately resubmerged. It is partially correct as the ARM on the Wall North of the Spent Fuel Pool is one of three "CRITICALITY MONITORS".

| Question 5 Info | | | |
|--------------------------|---|---|--------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 3.00 | | |
| Time to Complete: | 3 | | |
| Difficulty: | 3.00 | | |
| System ID: | 4503 | | |
| User-Defined ID: | 4503 | | |
| Cross Reference Number: | NLSRO0710.04 | | |
| Topic: | location of the indicator and trip units for the refuel floor area radiation monitor | | |
| RO value: | 3.9 | | |
| SRO Value: | 4.2 | | |
| KA Reference: | 295033 EK1.02 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-C-774-010 ON-120 RP-LG-462-1000 | Rev #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 43.4 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

6 ID: 23049 Points: 1.00

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- Unit 2 is in a normal HVAC alignment
- SGD-76-206-3 "Refuel Floor Area-SGTS Slide Gate Damper" is locked open
- SGD-76-506-2 "Unit 2 Rx Encl-SGTS Slide Gate Damper" is closed

The following occur simultaneously:

- An irradiated component is moved near the Refuel Floor Exhaust Radiation monitors resulting in Refuel Floor Exhaust Radiation Monitors Reading 2.6 mr/hr.
- A RWCU resin spill occurs in the Reactor Enclosure (RE) resulting in RE HVAC Exhaust rad level of 1.50 mr/hr.

WHICH ONE of the following describes the status of Reactor Enclosure and Refuel Floor HVAC based on the conditions above?

| | <u>RE HVAC</u> | <u>RF HVAC</u> |
|----|---------------------------------|--------------------------|
| A. | Unit 2 RE HVAC isolate | RF HVAC isolates |
| B. | Unit 2 RE HVAC does NOT isolate | RF HVAC isolates |
| C. | Unit 2 RE HVAC isolates | RF HVAC does NOT isolate |
| D. | Unit 2 RE HVAC does NOT isolate | RF HVAC does NOT isolate |

Answer: B

Answer Explanation:

Unit 2 RE HVAC does NOT isolate/RF HVAC isolates, Correct: Radiation conditions in the RE would not cause an isolation as SGD-76-506-2 is closed. (If the SGD was open 1.50 MR/hr would result in a RE isolation). Refuel Floor Rad above 2.0 mr/hr will result in a Refuel Floor HVAC isolation as SGD-76-206-3 is open, but this RF signal will not result in a Unit 2 RE isolation.

DISTRACTORS:

Unit 2 RE HVAC isolates/RF HVAC isolates: Incorrect, Radiation conditions in the RE would not cause an isolation as SGD-76-506-2 is closed. (If the SGD was open 1.50 MR/hr would result in a RE isolation). Partially correct, Refuel Floor Rad above 2.0 mr/hr will result in a Refuel Floor HVAC isolation as SGD-76-206-3 is open.

Unit 2 RE HVAC isolates/RF does NOT HVAC isolates: Radiation conditions in the RE would not cause an isolation as SGD-76-506-2 is closed. (If the SGD was open 1.50 MR/hr would result in a RE isolation). Additionally, Refuel Floor Rad above 2.0 mr/hr will result in a Refuel Floor HVAC isolation as SGD-76-206-3 is open.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

Unit 2 RE HVAC NOT isolates/RF HVAC does NOT isolates: Partially correct, Radiation conditions in the RE would not cause an isolation as SGD-76-506-2 is closed. (If the SGD was open 1.50 MR/hr would result in a RE isolation). Incorrect: Refuel Floor Rad above 2.0 mr/hr will result in a Refuel Floor HVAC isolation as SGD-76-206-3 is open.

| 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: | 23049 | | |
| User-Defined ID: | 23049 | | |
| Cross Reference Number: | NLSRO0720.04 | | |
| Topic: | RE & RF hvac response to Hi Rad | | |
| RO value: | 3.8 | | |
| SRO Value: | 3.9 | | |
| KA Reference: | 295034 EA2.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-474 | Rev #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | ILT Cert Exam 2005 | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Changed to RE ENC Isolation does not occur to illustrate LGS/PBAPS difference | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

7

ID: 23052

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- Plant Monitoring System (PMS) is inoperable
- Control Rod 26-27 inadvertently scrams

WHICH ONE of the following can be used to confirm that control rod 26-27 has fully inserted?

- A. "XX" (two X's) on the Four Rod Display.
- B. Green "IN" light is lit on the Full Core Display.
- C. "- -" (two dashed lines) on the Four Rod Display.
- D. Blue "SCRAM" light is lit on the Full Core Display.

Answer: B

Answer Explanation:

ANSWER: Green "IN" light is lit on the Full Core Display: The full in and full out lights on the Full Core Display continue to function with PMS and RDCS inoperable.

DISTRACTORS:

"XX" (two X's) on the Four Rod Display: Incorrect, This indicates a Data fault for the rod in question, BUT does not indicate control rod position.

"- -" (two dashed lines) on the Four Rod Display: Incorrect, this indication on the Four Rod Display indicates an odd numbered reed switch is made up.

Blue "SCRAM" light is lit on the Full Core Display: Incorrect, the blue "SCRAM" light on the Full Core Display indicates that the scram valves are open, BUT does not indicate control rod position

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 7 Info | | |
|--------------------------|---|------------------------|
| Question Type: | Multiple Choice | |
| Status: | Active | |
| Always select on test? | No | |
| Authorized for practice? | No | |
| Points: | 1.00 | |
| Time to Complete: | 2 | |
| Difficulty: | 3.00 | |
| System ID: | 23052 | |
| User-Defined ID: | 23052 | |
| Cross Reference Number: | NLSRO0080L.02E | |
| Topic: | Determining Rod Scram with PMS INOP | |
| RO value: | 4.3 | |
| SRO Value: | 4.4 | |
| KA Reference: | 295006 AA2.02 | |
| Comments: | General Data | |
| | Technical Reference with Revision Number: | GP-11 Revision #: |
| | Cognitive Level | L |
| | PRA: (i.e. Yes or No or #) | N |
| | 10CFR55.43 (n/a for RO) | 41.6 |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS ILT Bank |
| | Question Source: (i.e. New, Bank, Modified) | Bank |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Bank |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None |
| | Low KA Justification (if required): | N/A |
| | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

8

ID: 23053

Points: 1.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- Cavity Flood up is in progress using the "1A" Core Spray pump

A leak develops in the reactor coolant system which causes reactor level to drop to -138"

WHICH ONE of the following identifies the response of the "1A" Core Spray Pump and the Inboard (HV52-1F005) and Outboard (HV-52-1F004A) Injection Valves?

| | <u>"1A" Core Spray Pump</u> | <u>Injection Valves</u> |
|----|----------------------------------|-------------------------|
| A. | Continues to run | Automatically Open |
| B. | Continues to run | Must be Manually Opened |
| C. | Trips and Automatically Restarts | Automatically Open |
| D. | Trips and Automatically Restarts | Must be Manually Opened |

Answer: C

Answer Explanation:

ANSWER: Trips and Automatically Restarts/ Automatically Opens: Core sprays pumps will trip and automatically restart on -129", Injection valves will automatically open with initiation signal present and Rx pressure below 455 psig

DISTRACTORS:

Continues to run / Automatically Open: Incorrect as Core sprays pumps will trip and automatically restart on -129" Partially correct as Injection valves will automatically open with initiation signal present and Rx pressure below 455 psig

Continues to run/Must Be manually Opened: Incorrect as Core sprays pumps pumps will trip and automatically restart on -129", and injection valves will automatically open with initiation signal present and Rx pressure below 455 psig

Trips and Automatically Restarts/Must be Manually Opened: Partially correct as Core sprays pumps will trip and automatically restart on -129". Incorrect as injection valves will automatically open with initiation signal present and Rx pressure below 455 psig

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 4.00 | | |
| System ID: | 23053 | | |
| User-Defined ID: | 23053 | | |
| Cross Reference Number: | NLSRO0350L.02 | | |
| Topic: | CS Pump and valve response to low level during OPGON 5 | | |
| RO value: | 4.2 | | |
| SRO Value: | 4.3 | | |
| KA Reference: | 295031 EK2.03 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-21-1040-E-005 Sht 1 E-164 Sht 2 and 5 | Rev #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Changed to Core Spray running prior to LOCA | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

9

ID: 23116

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- Control Rod Stroking is in progress for Control Rod 46-47

Unit 2 Instrument Air Header develops a leak and depressurizes to 0 psig

WHICH ONE of the following describes the response of Control Rod 46-47 Scram Inlet and Outlet Valves, and the Unit 2 CRD Flow Control Valve?

| | <u>Control Rod 46-47 Scram Inlet and Outlet Valves</u> | <u>Unit 2 CRD Flow Control Valve</u> |
|----|--|--|
| A. | Open | Fails Open |
| B. | Open | Fails closed |
| C. | Remain Closed | Fails Open |
| D. | Remain Closed | Fails Closed |

Answer: B

Answer Explanation:

Answer: OPEN / Fails Closed: Correct, Low Instrument Air pressure causes CRD HCU Scram Valves to open. Additionally, the flow control valve FAIL CLOSED on a loss of actuating air pressure.

Distracters:

Remain Closed / Fails Open: Incorrect, Low Instrument Air pressure causes CRD HCU Scram Valves to open. Partially correct, the flow control valve FAIL CLOSED on a loss of actuating air pressure.

Remain Closed / Fails Closed: Incorrect, Low Instrument Air pressure causes CRD HCU Scram Valves to open, and the flow control valve FAIL CLOSED on a loss of actuating air pressure.

Answer: OPEN /Fails Open: Partially correct, Low Instrument Air pressure causes CRD HCU Scram Valves to open. Incorrect the flow control valve FAIL CLOSED on a loss of actuating air pressure.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 9 Info | | | |
|--------------------------|---|---|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23116 | | |
| User-Defined ID: | 23116 | | |
| Cross Reference Number: | NLSRO0070.02 | | |
| Topic: | Describe the effect of Instrument air pressure at 0 psig impact on CRD | | |
| RO value: | 3.3 | | |
| SRO Value: | 3.1 | | |
| KA Reference: | 295019 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | ON-107 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS BANK | |
| | Question Source: (i.e. New, Bank, Modified) | Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Changed to conditions appropriate to OPCON 5 | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | M-0046 sht 2 indentifying FCVs fail closed on loss of Air. Note: M-0046 sht 2 can be supplied if "FC" and notes are removed | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

10

ID: 23113

Points: 1.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- A fire breaks out in the Energized Refuel Bridge and Trolley Power Center Cabinet
- The Fire has been reported to the MCR
- SE-8 "Fire", has been entered

WHICH ONE of the following is the preferred fire suppression agents to effectively extinguish this fire, and which additional action that should be should be taken?

- A. Portable CO₂ Extinguisher, Activate Fire Brigade
- B. Portable CO₂ Extinguisher, Dispatch Fire Brigade Leader, Fire Brigade Activation is not required
- C. Water Hose Reel, Activate Fire Brigade
- D. Water Hose Reel, Dispatch Fire Brigade Leader, Fire Brigade Activation is not required

Answer: A

Answer Explanation:

ANSWER: Portable CO₂ Extinguisher, Activate Fire Brigade :

CO₂ Extinguisher are available on the Unit 1 Refuel Floor (by 579 door, North wall of RX Enc, By 581 door, and by South Stack Air lock), and are effective on the Class C fires (energized electrical). SE-8 requires activation Fire Brigade based on report of Fire

Fire Classifications are:

- Class A , Common combustibles
- Class B, Flammable liquids
- Class C, Energized electrical equipment
- Class D, Combustible metals

As the bridge is "energized: this fire is a Class "C" fire. IF the bridge were de-energized it would be "A"

SE-8 requires activation of the Fire Brigade based on report of Fire

DISTRACTORS:

Portable CO₂ Extinguisher, Dispatch Fire Brigade Leader, Fire Brigade Activation is not required: Partially correct, Portable CO₂ Extinguishers are available on the refuel floor. Incorrect, Fire Brigade Activation is not required, this would be true for a Fire Alarm only, but as fire was reported to MCR brigade activation is required.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

Water Hose Reel, Activate Fire Brigade: Partially correct, SE-8 requires activation of the Fire Brigade based on report of Fire. Incorrect Water hose reel is available, but as the bridge is "energized: this fire is a Class "C" fire. IF the bridge were de-energized it would be "A"

Water Hose Reel, Dispatch Fire Brigade Leader, Fire Brigade Activation is not required: Incorrect, Incorrect Water hose reel is available, but as the bridge is "energized: this fire is a Class "C" fire. IF the bridge were de-energized it would be "A". Fire Brigade Activation is not required, this would be true for a Fire Alarm only, but as fire was reported to MCR brigade activation is required.

| Question 10 Info | | | |
|--------------------------|---|----------------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23113 | | |
| User-Defined ID: | 23113 | | |
| Cross Reference Number: | NLSRO0685L.02 | | |
| Topic: | Fire in the Energized Refuel Bridge Cabinet. / fire suppression | | |
| RO value: | 2.8 | | |
| SRO Value: | 3.4 | | |
| KA Reference: | 600000 AK3.04 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | F-R-700 F-R-708 SE-8 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | 41.10 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | NONE | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | SE-8 | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

11

ID: 23056

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- Reactor coolant temperature is 95°F
- The "2B" loop of RHR is in Shutdown Cooling (SDC), with the "0B" RHRSW pump in service
- The "2A" and "2C" RHR pumps are unavailable due to D21 and D23 bus work
- "2B" and "2D" Core Spray pumps are OPERABLE for ECCS

An electrical fault causes The "0B" RHRSW pump to trip on overcurrent.

WHICH ONE of the following describes the ability to restore decay heat removal using the RHR system?

- A. RHR SDC cannot be restored with the current conditions.
- B. SDC can be restored with the "0D" RHRSW pump and the "2B" heat exchanger.
- C. SDC can be restored with the "0A" RHRSW pump and the "2B" heat exchanger.
- D. SDC can be restored with the "0D" RHRSW pump and the "2A" heat exchanger.

Answer: B

Answer Explanation:

ANSWER: SDC can be restored with the "0D" RHRSW pump and the "2B" heat exchanger: Correct, With the configuration given (2B RHR and 0B RHRSW pump in service) the 2B RHRSW heat exchanger is in service. The 0D RHRSW pump can be started and aligned to the 2B Heat exchange.

DISTRACTORS:

RHR SDC cannot be restored with the current conditions: See Above

SDC can be restored with the "0A" RHRSW pump and the "2B" heat exchanger: Incorrect, 0A RHRSW pump cannot be aligned to the 2B heat exchanger.

SDC can be restored with the "0D" RHRSW pump and the "2A" heat exchanger: Incorrect Although available, the 0D RHRSW pump cannot be lined up to the "2A" heat exchanger, additionally, the 2A and 2C RHR pumps (which can be lined up to the 2A heat exchanger) are out of service.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 11 Info | | | |
|--------------------------|---|---|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 4 | | |
| Difficulty: | 5.00 | | |
| System ID: | 23056 | | |
| User-Defined ID: | 23056 | | |
| Cross Reference Number: | NLSRO0370L.02 | | |
| Topic: | 2B SDC in service loss of 0B RHRSW pump | | |
| RO value: | 3.5 | | |
| SRO Value: | 3.6 | | |
| KA Reference: | 205000, K1.15 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | S51.8.B and M-51 P&ID's | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.4 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | 2008 LSRO Requal | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Changed from RHR hxchr inlet valve failure to RHRSW pump trip | |
| | Supplied Ref (if appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

12 ID: 23058 Points: 1.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- All SRMs are Operable
- Core Shuffle Part 1 is in progress
- Control Rod withdraw to support uncoupling is occurring in offloaded cells

A short to ground electrical fault results in a loss of 1AY160 (RPS/UPS power) electrical bus.

WHICH ONE of the following describes the effect on the ability to continue fuel moves, AND the ability to withdraw Control Rods in OFFLOADED cells?

| | <u>Fuel Moves</u> | <u>Control Rod Withdraw</u> |
|----|---|---|
| A. | CAN occur in "B" and "D" core quadrants only | CAN occur in any core quadrant |
| B. | CAN occur in "B" and "D" core quadrants only | CAN occur in "B" and "D" core quadrants only |
| C. | CANNOT occur in any core quadrant | CAN occur in any core quadrant |
| D. | CANNOT occur in any core quadrant | CANNOT occur in any core quadrant |

Answer: C

Answer Explanation:

ANSWER: Fuel moves CANNOT occur in any core quadrant / Control Rod withdraw CAN occur in any core quadrant: Correct, the loss of 1AY160 will result in a loss of power to the 1A and 1C SRMs. Tech Spec 3.9.2 requires that an SRM be operable in the quadrant where the core alteration is being performed, and the face adjacent quadrant. Fuel moves in the "B" quadrant would require 1A or 1C SRM to be operable. Fuel moves in the D quadrant would require 1A or 1C SRM to be operable.

Control Rod withdraw in OFFLOADED cells is not considered a core alteration, and therefore can continue in any core quadrant with the two remaining operable SRMs.

DISTRACTORS: Fuel moves CAN occur in B & D core quadrants only / Control Rod withdraw CAN occur in any core quadrant: SEE ABOVE

Fuel moves CAN occur in B & D core quadrants only / Control Rod withdraw CAN occur in B & D core quadrants only: SEE ABOVE

Fuel moves CANNOT occur in any quadrant / Control Rod withdraw CANNOT occur in any quadrant: SEE ABOVE

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 12 Info | | | |
|--------------------------|---|-------------------------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23058 | | |
| User-Defined ID: | 23058 | | |
| Cross Reference Number: | NLSRO0655L.01 | | |
| Topic: | Loss of 1AY160 , SRM loss of power, impact on fuel moves and CRD movement | | |
| RO value: | 2.6 | | |
| SRO Value: | 2.8 | | |
| KA Reference: | 215004 K2.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-1AY160 / Tech Spec 3.9.2 3.9.10.2 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 43.2 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

13 ID: 23104 Points: 1.00

ATTACHMENT 1

PBAPS Unit 2 is in a refueling outage with plant conditions as follows:

- Core Shuffle Part II is almost complete
- Refuel Platform is currently over the Spent Fuel Pool with a new Fuel Assembly grappled in the 'Full Normal Up' position

The Following is Observed:

- Refuel Floor Area Radiation Monitors (ARMs 3.7, 3.8, 3.9, and 3.10)
 - Local alarm horns simultaneously start sounding
 - Local alarm lights are lit
 - Auxiliary units indicate as shown on ATTACHMENT 1
- Refuel Platform ARM (AM-2) indicates as shown on ATTACHMENT 1
- Fuel Pool System Instrument Rack 20C075 Alarm as shown on ATTACHMENT 1

WHICH ONE of the following describes the required actions of the Refuel Platform crew?

- A. Immediately evacuate the Refuel Floor in accordance with GP-15 'Local Evacuation'.
- B. Continue the Fuel Assembly move in accordance with FH-6C 'Core Component Movement - Core Transfers'.
- C. Notify the control room of the refuel floor high radiation conditions and to enter the TRIP procedure T-103 'Secondary Containment Control'.
- D. Land the grappled Fuel Assembly at the closest available Fuel Pool location AND then evacuate the Refuel Floor in accordance with FH-74 'Actions in Response to an Unexpected Loss of Fuel Pool, Reactor Cavity, or Equipment Storage Pool Water Inventory'.

Answer: B

Answer Explanation:

B is correct because there is NO high radiation condition on the refuel floor (multiple Refuel Floor ARMs failing.) All four of the Refuel Floor ARMs (NOT the Refuel Platform AM-2) are powered from the same power supply (20Y034-03 powers the 'Indicator & Trip Units'). When the Indicator and Trip unit loses electrical power, then the local ARM Auxiliary Unit will alarm (light and horn) if the local electrical power supply is unaffected. The loss of the single power supply will cause the four ARMs to alarm (with a zero rad level indication on the meter). The failure of the ARMs is substantiated by the normal reading on the Refuel Platform ARM (AM-2) and the lack of alarm from the Fuel Pool Radiation Monitor (no alarm up on 20C075). NOTE – Peach Bottom has a Fuel Pool Radiation Monitor that alarms on the Fuel Pool System Instrument rack on High Radiation conditions; however, Limerick does NOT have a Fuel Pool Radiation Monitor

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

A is wrong because there is no high radiation condition on the refuel floor and no reason to evacuate.

C is wrong because T-103 is NOT entered for failure of the ARMs - there is NO challenge to containment.

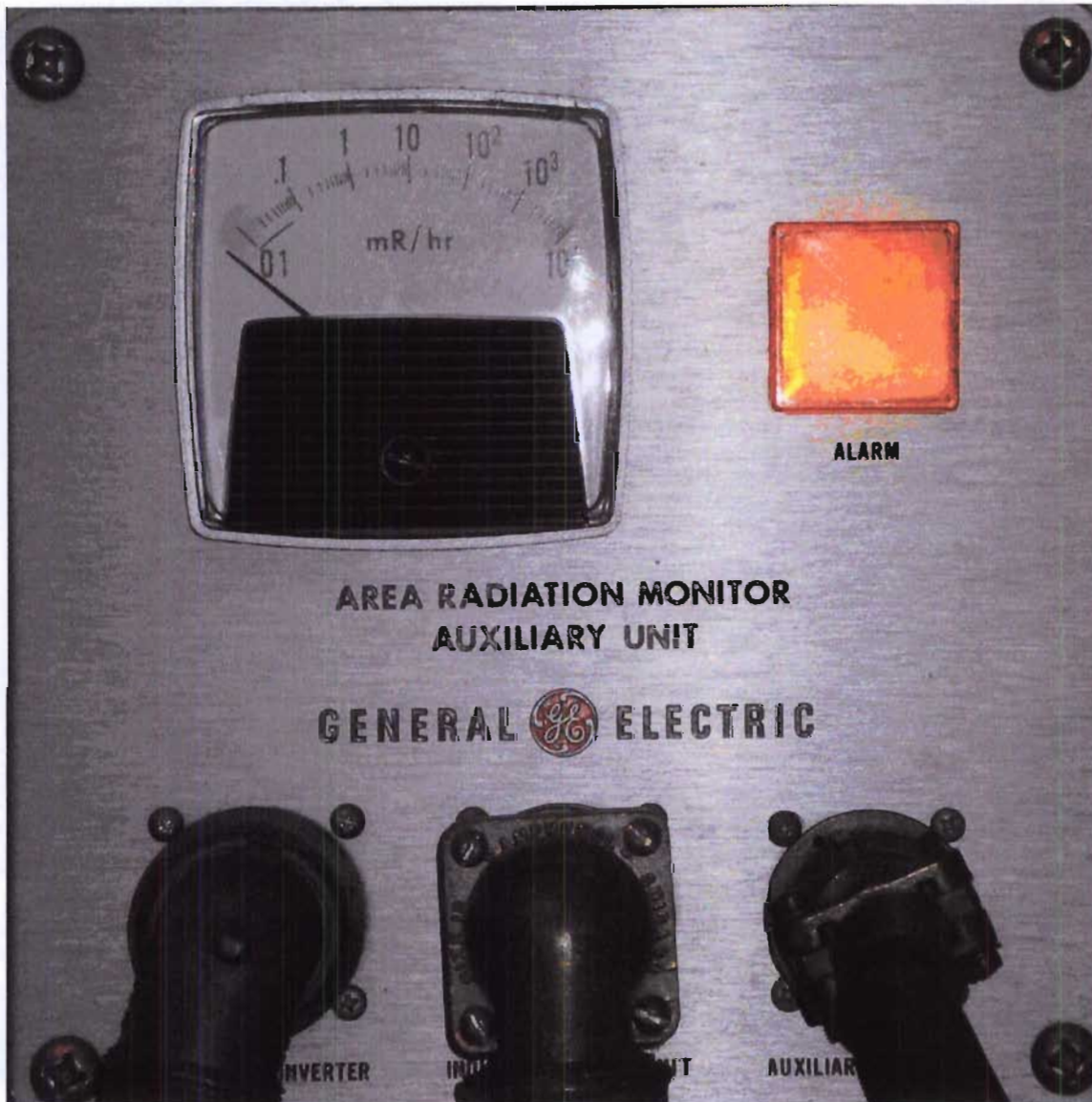
D is wrong because there is no reason to evacuate (FH-74 is NOT entered on ARM failure).

| Question 13 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: | 23104 | | |
| User-Defined ID: | 23104 | | |
| Cross Reference Number: | NLSRO-5063C-3 / 295023-7 | | |
| Topic: | PBAPS Use ARMs / Fuel Pool Rad Monitor / Refuel Bridge ARM to determine if evacuation is required | | |
| RO value: | 4.3 | | |
| SRO Value: | 4.3 | | |
| KA Reference: | 233000 G 2.1.45 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-1-S-56 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 10CFR55.43(b) 5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | Attachment 1 | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 9 | |

EXAM MATERIAL

ATTACHMENT 1

Page 1 of 3



Refuel Floor Area Radiation Monitors (ARMs 3.7, 3.8, 3.9, and 3.10) Auxiliary Unit indications

EXAM MATERIAL

ATTACHMENT 1

Page 2 of 3



Refuel Platform ARM (AM-2) Indication

EXAM MATERIAL

ATTACHMENT 1

Page 3 of 3



Fuel Pool System Instrument Rack 20C075 Alarms

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

14

ID: 23059

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- Reactor Mode Switch is in "REFUEL"
- All control rods are fully inserted
- Refuel Bridge is over core location 37-26, and is ready to raise a fuel bundle

The following occurs simultaneously:

- Control Rod 14-55 is given a continuous withdrawal signal
- Refuel Platform raises fuel bundle at location 37-26

Subsequently, the following indication are observed on the Refuel Platform:

- Reverse Stop #1
- Rod Block #1
- Rod Block #2

NO other indication are observed on the Refuel Platform

WHICH ONE of the following describes a failed interlock, and the required action?

| | <u>Failed Interlock</u> | <u>Required Action</u> |
|----|-------------------------|---|
| A. | Fuel Hoist Interlock | Place the equipment in a safe condition per S97.0.M |
| B. | Fuel Hoist Interlock | Place the equipment in a safe condition per ON-120 |
| C. | Reverse Stop #2 | Place the equipment in a safe condition per S97.0.M |
| D. | Reverse Stop #2 | Place the equipment in a safe condition per ON-120 |

Answer: A

Answer Explanation:

The following list all interlocks noted in question:

| INTERLOCK STATUS DISPLAY | INITIATING CONDITIONS |
|--------------------------|---|
| ROD BLOCK #1 | -BRIDGE NEAR OR OVER CORE AND -ANY HOIST FUEL LOADED |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| | |
|------------------------|---|
| ROD BLOCK #2 | -BRIDGE NEAR OR OVER CORE AND -ANY HOIST FUEL LOADED |
| BRIDGE REVERSE STOP #1 | -BRIDGE NEAR OR OVER CORE AND -ANY HOIST FUEL LOADED AND -ANY ROD NOT FULL IN |
| BRIDGE REVERSE STOP #2 | -BRIDGE NEAR OR OVER CORE AND -RX MODE- SWITCH NOT IN REFUEL OR -CONTROL ROD NOT SELECTED |
| FUEL HOIST INTERLOCK | -BRIDGE NEAR OR OVER CORE AND -MAIN HOIST FUEL LOADED AND -ANY ROD NOT FULL IN |

ANSWER: Fuel Hoist Interlock / Place the equipment in a safe condition

per S97.0.M: Correct with a control rod withdrawn, and the grapple loaded over the core, Fuel hoist interlock should have occurred. Additionally, the required action is contained in S97.0.M

DISTRACTORS:

Fuel Hoist Interlock / Place the equipment in a safe condition per ON-120": Partially correct, while this would constitute a Fuel Hoist Interlock failure, ON-120 "Fuel Handling Problems, does not provide direction for an interlock failure.

Reverse Stop #2 / Place the equipment in a safe condition per S97.0.M> Incorrect, this does not constitute an interlock failure as Bridge Reverse Stop #2 does not occur with the RX mode switch in Refuel. Partially correct, as the the required action is contained in S97.0.M

Reverse Stop #2 / Place the equipment in a safe condition per ON-120: this does not constitute an interlock failure as Bridge Reverse Stop #2 does not occur with the RX mode switch in Refuel. Additionally ON-120 "Fuel Handling Problems, does not provide direction for an interlock failure.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23059 | | |
| User-Defined ID: | 23059 | | |
| Cross Reference Number: | NLSRO0766.13 | | |
| Topic: | Response to rod w/d signal with the hoist loaded over the core | | |
| RO value: | 3.3 | | |
| SRO Value: | 4.1 | | |
| KA Reference: | 234000.K4.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | S97.0.M | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 43.5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | NEW | |
| | Question Source: (i.e. New, Bank, Modified) | NEW | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

15

ID: 23061

Points: 1.00

ATTACHMENT 2

LGS Unit 1 plant conditions are as follows:

- 10 and 20 Station Aux Buses are both energized
- All 4 KV buses are powered from their normal Safeguard Buses

The 10 Station Aux Bus is lost due to a transformer fault.

WHICH ONE of the following describes the status of the Unit 1 4KV buses and Emergency Diesel Generators (EDG) five (5) minutes later? (assume no operator action)

| | <u>Unit 1 4KV Bus Power</u> | <u>Emergency Diesels Running</u> |
|----|--|----------------------------------|
| A. | All buses powered from the 201 Safeguard Bus | Only D11 and D13 |
| B. | All buses powered from the 201 Safeguard Bus | No Diesels are running |
| C. | Only D12 and D14 buses powered from the 201 Safeguard Bus. | Only D11 and D13 |
| D. | Only D12 and D14 buses powered from the 201 Safeguard Bus | No Diesels are running |

Answer: A

Answer Explanation:

ANSWER: All 4 KV buses are powered from the 201 Safeguard Bus / Only D11 and D13 EDGs are running: Correct: Normal Bus alignment is as follows:

D12 and D14 powered from the 201 Safeguard bus, aligned to the the 20 Station Aux Bus

D11 and D13 powered from the 101 Safeguard bus, aligned to the the 10 Station Aux Bus.

On a loss of the of the 10 Station Aux Bus the D11 and D13 buses will experience undervoltage, and auto swap to the 201 Safeguard bus. Additionally the associated DG will receive a start signal, but the DG will not supply the bus as the autoswap to the 201 Safeguard bus occurs first.

Distractors:

All 4 KV buses are powered from the 201 Safeguard Bus. No EDGs are running: See above

Only D12 and D14 buses are powered from the 201 Safeguard Bus / Only D11 and D13 EDGs are running: See above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

D12 and D14 buses are powered from the 201 Safeguard Bus. No EDGs are running: See above

| Question 15 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: | 23061 | | |
| User-Defined ID: | 23061 | | |
| Cross Reference Number: | NLSRO0655L.03 | | |
| Topic: | Refuel, 10 Station Aux Bus lost, 4KV and DG response | | |
| RO value: | 3.2 | | |
| SRO Value: | 3.2 | | |
| KA Reference: | 262001 A3.02 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-1 E-10 1S92.9.A (COL) | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | 05-LSRO CERT | |
| | Question Source: (i.e. New, Bank, Modified) | Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Bank | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | E-1 | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

16

ID: 23097

Points: 1.00

PBAPS Unit 2 is in a refueling outage with plant conditions as follows:

- Reactor Cavity water level is + 474"
- The Steam Dryer is being removed
- Recirculation Pumps are OFF (shutdown)
- "2A" Loop of RHR is in Shutdown Cooling
- "2B" Loop of RHR is OFF (shutdown)
- "2A" Control Rod Drive (CRD) Pump is in service

Shutdown Cooling is removed from service.

WHICH ONE of the following describes the water flow through the # 8 Jet Pump inlet mixer?

- A. **NO** water flow (stagnant water inside Jet Pump) due to no forced flow.
- B. Water flow in the 'normal' direction (from annulus to core) due to natural circulation.
- C. Water flow in the 'reverse' direction (from core to annulus) due to natural circulation.
- D. Jet Pump Drive flow **AND** Jet Pump Driven flow due to the affect of the Control Rod Drive (CRD) Pump flow.

Answer: B

Answer Explanation:

B (water flow in the 'normal' direction (from annulus to core) due to natural circulation.) is correct because there is significant decay heat present when the starting a refueling outage. The decay heat will raise the temperature of the core water and with the Reactor Cavity water level filled above +50 inches there is direct communication between the hot water on the top of the core AND the cooler water in the Reactor Annulus region. This allows for cold water to enter the bottom of the core and then be removed with natural circulation (cooler water from the annulus region through the Jet Pump Inlet Mixers to the core and then through the separators back to the annulus region.

A (**NO** water flow (stagnant water inside Jet Pump) due to no forced flow.) is wrong because there is natural circulation even though there is no forced core flow

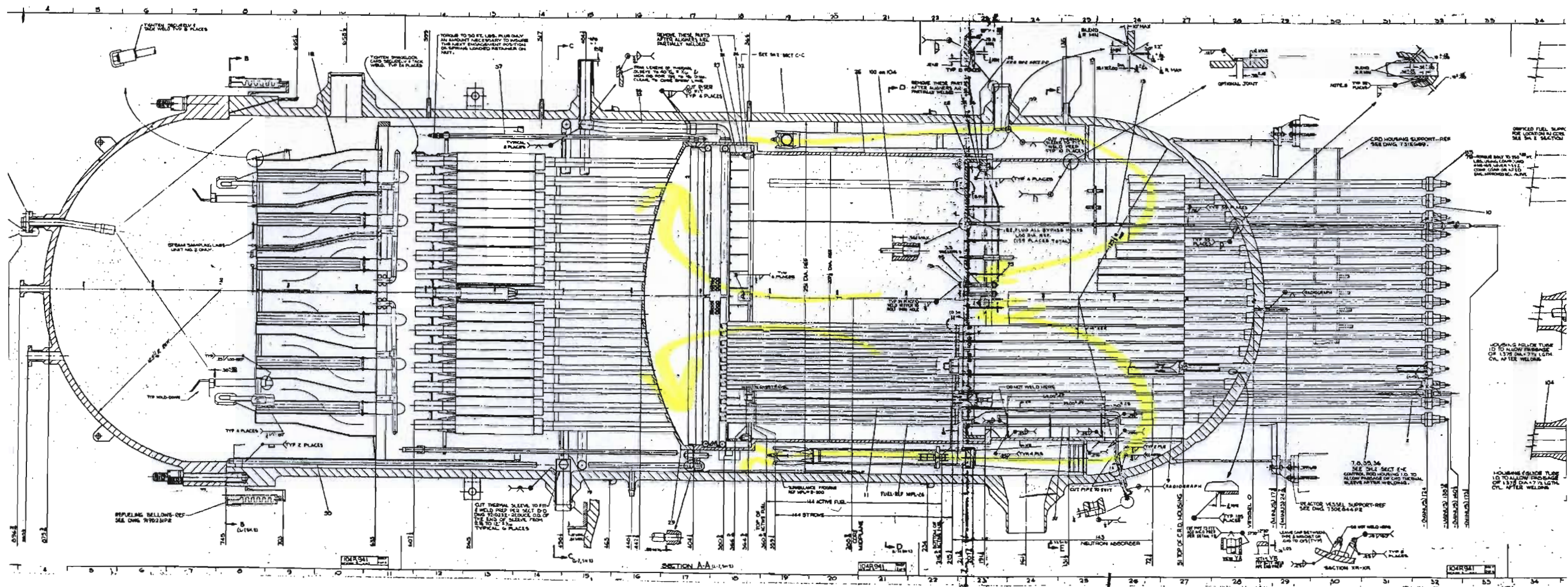
C (water flow in the 'reverse' direction (from core to annulus) due to flow from the other Recirc Loop Jet Pumps.) is wrong because there is not enough flow from the other loop of Jet pumps to drive reverse flow (no forced core flow).

D (Jet Pump Drive flow **AND** Jet Pump Driven flow due to the affect of the Control Rod Drive (CRD) Pump flow.) is wrong because the CRD pump does inject cold water into the bottom of the core but does NOT provide Jet Pump Drive flow.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | |
| System ID: | 23097 | |
| User-Defined ID: | 23097 | |
| Cross Reference Number: | NLSRO-5002-7 /234000-1 | |
| Topic: | Flow through Jet Pumps due to natural circulation (High decay heat load) | |
| RO value: | 3.3 | |
| SRO Value: | 3.5 | |
| KA Reference: | 290002 K4.05 | |
| Comments: | General Data | |
| | Technical Reference with Revision Number: | M-1-B-65 shts 3 & 4 M-352 shts 1 & 2 M-361 shts 1 & 2 |
| | | Revision #: 0/0 60/63 81/67 |
| | Cognitive Level | H |
| | PRA: (i.e. Yes or No or #) | N |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New |
| | Question Source: (i.e. New, Bank, Modified) | New |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None |
| | Low KA Justification (if required): | N/A |
| | | Safety Function 5 |



EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

17

ID: 23062

Points: 1.00

LGS Unit 1 Plant conditions are as follows:

- OPCON 5
- ST-6-107-632-1, "One Rod Out Interlock Verification Testing" is in progress
- Control Rod 34-35 is at position 00

Control Rod 34-35 is selected and withdrawn one notch using the WITHDRAW pushbutton

WHICH ONE of the following identifies the expected sequence of RDCS lamp indications?

- A. WITHDRAW light ONLY
- B. WITHDRAW light, SETTLE light ONLY
- C. INSERT light, WITHDRAW light ONLY
- D. INSERT light, WITHDRAW light, SETTLE light

Answer: D

Answer Explanation:

ANSWER: INSERT light, WITHDRAW light, SETTLE light: Correct, by pressing the WITHDRAW PB the following will happen:

1. insert signal to get collet fingers out of notch
2. withdraw signal
3. settle function

DISTRACTORS:

WITHDRAW light: See Above

WITHDRAW light, SETTLE light: See Above

INSERT light, WITHDRAW light: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 17 Info | | | |
|--------------------------|---|--------------------------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23062 | | |
| User-Defined ID: | 23062 | | |
| Cross Reference Number: | NLSRO0080.09 | | |
| Topic: | identifies the sequence of RDCS lamp indications for a continuous rod withdrawal from notch 10 to | | |
| RO value: | 3.5 | | |
| SRO Value: | 3.4 | | |
| KA Reference: | 201002 K4.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | S73.1.A | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | N/A | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Mod for OPCON 5, and single notch WD | |
| | Supplied Ref (if appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

18

ID: 23112

Points: 1.00

PBAPS Unit 2 is in a refueling outage with plant conditions as follows:

- Control Rod 46-31 is being withdrawn to support Control Rod Drive replacement
- The Control Rod Blade becomes uncoupled from the Control Rod Drive and remains full in
- The Control Rod Drive is withdrawn to position 48

The Control Rod Blade drops until seated in bottom of the guide tube

WHICH ONE of the following correctly identifies the components that limit Control Rod Blade speed during this rod drop accident?

- A. Velocity Limiter AND Guide Tube
- B. Guide Tube AND Bellville Washers
- C. CRD Mechanism Buffer Orifice AND Velocity Limiter
- D. Bellville Washers AND CRD Mechanism Buffer Orifice

Answer: A

Answer Explanation:

A (Velocity Limiter AND Guide Tube) is correct because the velocity limiter works in conjunction with the Guide tube to perform the function of a piston. For the velocity limiter to be effective, it must operate inside a cylinder of appropriate size (Guide Tube)

B (Guide Tube and Bellville Washers) is wrong because the bellville washers do nothing to slow down a dropped rod (however, the washers will work to slow a rod that is scrambling into the core)

C (CRD Mechanism Buffer Orifice AND Velocity Limiter) is wrong because the CRD Mechanism Buffer Orifice will not slow down a dropped rod (however, the orifice will work to slow down a rod that is scrambling into the core)

D (Bellville Washers AND CRD Mechanism Buffer Orifice) is wrong because neither the CRD Mech Buffer Orifice or the Bellville washers will work to slow a dropped control rod.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 18 Info | | | |
|--------------------------|---|---|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23112 | | |
| User-Defined ID: | 23112 | | |
| Cross Reference Number: | NLSRO-5004-2 / 234000-19 | | |
| Topic: | Components that limit the speed of a dropped Control Rod | | |
| RO value: | 2.9 | | |
| SRO Value: | 3.0 | | |
| KA Reference: | 201003 K4.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | PBAPS UFSAR Chapter 3 section 3.4.5.1.2 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS LOT Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Modified from the Limerick LOT exam bank question ID # 17049 (User-Defined ID: LIMERICK LOT 1957) | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | UFSAR | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 1 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

19

ID: 23063

Points: 1.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- "1A" RHR is in Shutdown Cooling

A reactor coolant leak develops causing RPV Water level to drop to +20" before it is stabilized using the "1A" loop of Core Spray. Subsequently the following occurs:

- "1A" and "1C" Core Spray pumps trip and cannot be restarted
- All other Core Spray pumps fail to start and inject
- "1B", "1C", and "1D" RHR pumps fail to start and inject

Reactor level drops -135"

WHICH ONE of the following identifies the response of the "1A" RHR subsystem, and impact on RPV Level?

| | <u>"1A" RHR Response</u> | <u>Impact on RPV Level</u> |
|----|---|------------------------------|
| A. | Shutdown Cooling will Isolate LPCI will Inject | Level will go up |
| B. | Shutdown Cooling will Isolate LPCI will NOT inject | Level will continue to lower |
| C. | Shutdown Cooling Remains lined-up LPCI will inject | Level will go up |
| D. | Shutdown Cooling Remains lined-up LPCI will NOT inject | Level will continue to lower |

Answer: B

Answer Explanation:

ANSWER: Shutdown Cooling will Isolate, LPCI will NOT inject / Level will continue to lower:

Correct: "A" Loop of Core Spray is maintaining Level, above the SDC isolation setpoint. A subsequent LOOP, and trip of "A" core Spray results in loss of all ECCS pumps except "A" RHR. RPV water level lowers below the SDC isolation and LPCI injection RPV levels. LPCI will not inject and consequently level will continue to lower.

In OPCON 3 the Group IIA Shutdown Cooling Isolation will never be bypassed per procedure so that when RPV level goes below 12.5 inches the Suction and Return valves will close. When the 1F008 and 1F009 valves are not full open, the 1A RHR pump will trip on loss of suction flow path and the 1F015A valve will close. In the lineup for SDC, the 1A RHR pump suction from the SP (1F004A) is close so that there will be no flow path for the RHR pump to start and inject into the RPV for LPCI mode.

DISTRACTORS:

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

Shutdown Cooling will Isolate, LPCI will inject / Level will go up: See Above

Shutdown Cooling Remains lined-up, LPCI will inject / Level will go up: See Above

Shutdown Cooling Remains lined-up, LPCI will NOT inject / Level will continue to lower: See Above

| Question 19 Info | | | |
|--------------------------|---|---------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 4 | | |
| Difficulty: | 4.00 | | |
| System ID: | 23063 | | |
| User-Defined ID: | 23063 | | |
| Cross Reference Number: | NSLRO0370.10 | | |
| Topic: | OPCON 3 - "1A" RHR is in SDC level drops, LPCI response, level trend | | |
| RO value: | 4.3 | | |
| SRO Value: | 4.4 | | |
| KA Reference: | 203000 K3.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | S51.8.B | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

20 ID: 23066 Points: 1.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- "1B" RHR is in ADHR, with Reactor coolant temperature at 98°F, and steady
- "1A" RWCU pump is in service

The "1B" RECW pump trips, and the "1A" RECW fails to start automatically or manually.

Given the following:

- HV-44-1F001 (RWCU Cleanup Inboard PCIV)
- HV-44-1F004 (RWCU Cleanup Outboard PCIV)

WHICH ONE of the following describes the expected condition of above components, 5 minutes later?

- A. "1A" RWCU Pump is in service
HV-44-1F001 is OPEN
HV-44-1F004 is OPEN
- B. "1A" RWCU Pump is Tripped
HV-44-1F001 is OPEN
HV-44-1F004 is OPEN
- C. "1A" RWCU Pump is Tripped
HV-44-1F001 is OPEN
HV-44-1F004 is CLOSED
- D. "1A" RWCU Pump is Tripped
HV-44-1F001 is CLOSED
HV-44-1F004 is CLOSED

Answer: B

Answer Explanation:

ANSWER: "1A" RWCU Pump is Tripped / BOTH HV-44-1F001 AND HV-44-1F004 are OPEN: Correct, A loss of RECW for 10 seconds will result in a trip of the 1A RWCU pump, but will not result in an isolation of RWCU (both PCIVs remain open)

DISTRACTORS:

"1A" RWCU Pump is in service / BOTH HV-44-1F001 AND HV-44-1F004 are OPEN:
See Above

"1A" RWCU Pump is Tripped / HV-44-1F001 is OPEN, HV-44-1F004 is CLOSED:
Partially correct as RWCU pump will trip. Incorrect as HV-44-1F004 will not close, unless NRHX outlet temperature > 140°F. (reactor coolant temperature is noted in the stem as 98°F)

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

"1A" RWCU Pump is Tripped/ Both HV-44-1F001 AND HV-44-1F004 are CLOSED:
See above

| Question 20 Info | | |
|--------------------------|---|---|
| Question Type: | Multiple Choice | |
| Status: | Active | |
| Always select on test? | No | |
| Authorized for practice? | No | |
| Points: | 1.00 | |
| Time to Complete: | 4 | |
| Difficulty: | 4.00 | |
| System ID: | 23066 | |
| User-Defined ID: | 23066 | |
| Cross Reference Number: | NLSRO0110L | |
| Topic: | Opcon 5 RWCU pump response to loss of RECW | |
| RO value: | 3.1 | |
| SRO Value: | 3.0 | |
| KA Reference: | 204000 A4.01 | |
| Comments: | General Data | |
| | Technical Reference with Revision Number: | UFSAR pg 3.1.6, SGTS S76.9.A ARC-MCR-112, H-1 |
| | | Rev #: |
| | Cognitive Level | L |
| | PRA: (i.e. Yes or No or #) | N |
| | 10CFR55.43 (n/a for RO) | N/A |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New |
| | Question Source: (i.e. New, Bank, Modified) | New |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None |
| | Low KA Justification (if required): | N/A |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

21

ID: 23095

Points: 1.00

PBAPS Unit 2 plant conditions are as follows:

- MODE 5
- Core Shuffle Part II is complete
- Fuel Pool To Reactor Cavity Gates are removed
- Fuel Pool Cooling (FPC) is in service
- Reactor Water Cleanup (RWCU) is in service
- The "2A" and "2B" Loops of RHR are blocked for maintenance
- Reactor Cavity water temperature is 120°F and steady

An equipment failure results in an inadvertent Standby Liquid Control (SLC) initiation.

WHICH ONE of the following describes the impact of the SLC initiation? (Assume no Operator actions)

- A. Fuel Pool water level will lower.
- B. Reactor Cavity water pH will rise.
- C. Reactor Cavity water temperature will rise.
- D. Wide Range Neutron Monitor (WRNM) indications will go up.

Answer: C

Answer Explanation:

C (Reactor Cavity water temperature will rise.) is correct since the SLC initiation will cause a RWCU isolation. Since RWCU was removing decay heat before the SLC initiation, the lack of decay heat removal will cause Reactor Cavity water temperature to go up (rise)

A (Fuel Pool water level will lower.) is wrong because water level will NOT lower following the SLC initiation. Water level may start to rise since SLC is injecting AND RWCU may have been lined up for let down as well as for decay heat removal.

B (Reactor Cavity water pH will rise.) is wrong because the SLC will mix with the Reactor water and form an acidic solution (pH ↓)

D [Wide Range Neutron Monitor (WRNM) indications will go up.] is wrong because the SLC is a poison that will absorb thermal neutrons (removing the thermal neutrons from the WRNM detectors). Thermal neutron population should go down)

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 21 Info | | | |
|--------------------------|---|-------------------|----------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23095 | | |
| User-Defined ID: | 23095 | | |
| Cross Reference Number: | NLSRO-5011-4 / 295023-3 | | |
| Topic: | PBAPS initiation of SBL results in a RWCU isolation and resultant temp rise | | |
| RO value: | 3.7 | | |
| SRO Value: | 3.8 | | |
| KA Reference: | 211000 A1.08 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | PBAPS GP-8B | Revision #: 18 |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | PBAPS GP-8B | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 1 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

22

ID: 23103

Points: 1.00

PBAPS Unit 2 is in a refueling outage with the following plant conditions:

- MODE 5
- Core Shuffle Part II is complete
- Control Rod stroking is in progress
- Wide Range Neutron Monitor (WRNM) indications are as shown below:

| WRNM | Count rate (CPS) | Reactor Period (seconds) |
|------|------------------|--------------------------|
| A | 105 | Infinite (∞) |
| B | Bypassed | Bypassed |
| C | 120 | Infinite (∞) |
| D | 110 | Infinite (∞) |
| E | Bypassed | Bypassed |
| F | 95 | Infinite (∞) |
| G | 100 | Infinite (∞) |
| H | 110 | Infinite (∞) |

- Subsequently, the following WRNM indications are noted:

| WRNM | Count rate (CPS) | Reactor Period (seconds) |
|------|------------------|--------------------------|
| A | 105 | Infinite (∞) |
| B | Bypassed | Bypassed |
| C | 1200 | Positive (+) 10 |
| D | 10 | Negative (-) 200 |
| E | Bypassed | Bypassed |
| F | 95 | Infinite (∞) |
| G | 5 | Negative (-) 100 |
| H | 450 | Positive (+) 15 |

WHICH ONE of the following describes the plant response to the change in WRNM indications?

- A. 'A' half scram **ONLY**
- B. 'B' half scram **ONLY**
- C. **NO** impact on RPS
- D. Full Scram

Answer: D

Answer Explanation:

ANSWER: (Full Scram) is correct because the 'C' WRNM inputs into the 'A' RPS logic and the 'H' inputs into the 'B' RPS. Since the Reactor Period trip setpoint is +19, both the C and H WRNMs provide a trip of the A & B RPS circuitry which results in a Full Scram condition. NOTE – Limerick does NOT have WRNMs or an RPS trip on low Reactor Period.

DISTRACTORS:

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

(**NO** impact on RPS) is wrong because the RPS function is active during MODE 5 conditions (and at times required by Tech Specs).

('A' half scram **ONLY**) is wrong because there will also be a 'B' RPS half scram as well

('B' half scram **ONLY**) is wrong because there will also be an 'A' RPS half scram as well

| 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: | 3.00 | | |
| System ID: | 23103 | | |
| User-Defined ID: | 23103 | | |
| Cross Reference Number: | NLSRO-5060C-1 / 295023-3 | | |
| Topic: | PBAPS -- determine how spiking on various WRNMs impacts RPS (scram or half scram) | | |
| RO value: | 3.3 | | |
| SRO Value: | 3.4 | | |
| KA Reference: | 212000 K5.02 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-1-S-54 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 7 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

23 ID: 23067 Points: 1.00

LGS Unit 1 is in OPCON 2 with the following IRM indications:

| <u>IRM</u> | <u>RANGE</u> | <u>READING</u> |
|------------|--------------|----------------|
| A | 6 | 79 |
| B | 6 | 83 |
| C | 6 | 110 |
| D | 6 | Bypassed |
| E | 6 | 97 |
| F | 6 | 122 |
| G | 6 | 81 |
| H | 6 | 103 |

WHICH ONE of the following describe the expected plant status?

| | <u>Scram Signal</u> | <u>Control Rod Withdraw Block</u> |
|----|---------------------|-----------------------------------|
| A. | NO Scram | NOT Enforced |
| B. | NO Scram | Enforced |
| C. | 1/2 Scram ONLY | Enforced |
| D. | Full Scram | Enforced |

Answer: C

Answer Explanation:

ANSWER: ONLY 1/2 Scram Signal, AND Control Rod Withdraw Block Enforced:

Correct: IRM F (B RPS) is reading >120 which indicates there should be a B RPS actuation (1/2 Scram), Additionally IRMs C and H are above setpoint for a Rod Block >85

DISTRACTORS:

Full RPS Scram, AND Control Rod Withdraw Block Enforced: See above

NO Scram Signal, NO Control Rod Withdraw Block Enforced : See Above

NO Scram Signal,Control Rod Withdraw Block Enforced: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23067 | | |
| User-Defined ID: | 23067 | | |
| Cross Reference Number: | NLSRO0240L.04 | | |
| Topic: | IRM Reading, indentify expected RPS response | | |
| RO value: | 3.7 | | |
| SRO Value: | 3.6 | | |
| KA Reference: | 215003 A3.03 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | ARC-MCR-107-F3 ARC-MCR-107-H3 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Changed from scram to rod block and 1/2 scram | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

24

ID: 23068

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- "2A" RHR is in Shutdown Cooling (SDC) in service
- Pressure Transmitter failures result in High Reactor Pressure Signals on all 4 SDC Group 2 RPV pressure indicators

5 minutes have elapsed.

WHICH ONE of the following describes the expected status of the Shutdown Cooling Suction INBOARD and OUTBOARD valves?

HV-51-2F009 INBOARD HV-51-2F008 OUTBOARD

- | | | |
|----|--------|--------|
| A. | Closed | Closed |
| B. | Closed | Open |
| C. | Open | Closed |
| D. | Open | Open |

Answer: A

Answer Explanation:

ANSWER: Closed / Closed, Correct, The four noted pressure transmitters would result on closure of BOTH the Inboard and Outboard SDC isolation valves

DISTRACTORS:

Closed / Open: Incorrect, this would be correct if only the A or B transmitters failed

Open / Closed: Incorrect, this would be correct if only the C or D transmitters failed

Open / Open: Incorrect, see above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 24 Info | | | |
|--------------------------|---|--|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23068 | | |
| User-Defined ID: | 23068 | | |
| Cross Reference Number: | NLSRO0370L.08 | | |
| Topic: | OPCON 5 - Shutdown Cooling (SDC) in service - RPV pressure 50 psig during normal plant shutdown an | | |
| RO value: | 2.8 | | |
| SRO Value: | 2,9 | | |
| KA Reference: | 223002 K6.06 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | ON-121 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Modified for LSRO, still considered Bank Q | |
| | Supplied Ref (if appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

25

ID: 23069

Points: 1.00

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- Unit 1 Refuel Floor HVAC in service
- Both SGTS Fans are in their normal alignment "AUTO"
- A Refuel Floor Isolation signal causes both "0A" & "0B" SGTS fans to AUTO start

SGTS System flow stabilize at approximately 600 cfm

- The "0B" SGTS Fan control switch is taken to Standby (STBY)

WHICH ONE of the following describes the operation of the "0B" SGTS Fan, when its control switch is placed to STBY, and expected System Flow 2 minutes later?

- A. "0B" SGTS Fan Trips immediately,
System flow will be approximately 300 cfm:
- B. "0B" SGTS Fan Trips immediately,
System flow will be approximately 600 cfm
- C. "0B" SGTS Fan trips after 100 seconds,
System flow will be approximately 300 cfm
- D. "0B" SGTS Fan trips after 100 seconds,
System flow will be approximately 600 cfm

Answer: B

Answer Explanation:

ANSWER: 0B" SGTS Fan Trips immediately, System flow will be approximately 600 cfm: Correct: Taking the "0B" fan to Standby, will immediately trip the fan, and the fan will remain in standby unless a low flow is detected for 5 seconds. Both SGTS fans start on RF isolation signal, the flowrate is controlled by the combined modulation of the fan inlet, outlet and bypass dampers, with each fan capable of 8,400 cfm. Consequently, 600 cfm is well within the capacity of one fan, and the flow will remain unchanged when the "0B" fan is removed from service.

DISTRACTORS:

"0B" SGTS Fan trips immediately, System flow will be approximately 300 cfm: This is partially correct in that the "0B" fan will immediately trip. It is incorrect as flow will be Approximately 600cfm.

"0B" SGTS Fan trips after 100 seconds, System flow will be approximately 300 cfm: This is incorrect as the fan will trip immediately (100 seconds is the time associated with a low dP Refuel Floor isolation signal), and system flow will remain 600 cfm.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

"0B" SGTS Fan trips after 100 seconds, System flow will be approximately 600 cfm:
 This is incorrect as the fan will trip immediately (100 seconds is the time associated with a low dP Refuel Floor isolation signal). This is partially correct as low will be Approximately 600cfm.

| Question 25 Info | | | |
|--------------------------|---|--|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 4 | | |
| Difficulty: | 4.00 | | |
| System ID: | 23069 | | |
| User-Defined ID: | 23069 | | |
| Cross Reference Number: | NLSRO0200.06 | | |
| Topic: | SGTS fan switch taken to SB after isolation, system response | | |
| RO value: | 2.9 | | |
| SRO Value: | 3.1 | | |
| KA Reference: | 261000 A1.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | UFSAR Pg 3.1-6 ARC-MCR-002-H-1 S76.9.A | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | NEW | |
| | Question Source: (i.e. New, Bank, Modified) | NEW | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

26

ID: 5537

Points: 1.00

LGS Plant conditions are as follows:

- Loss of offsite power has occurred for BOTH Unit 1 and Unit 2
- Only D14 and D21 DGs are running and powering their respective buses.

WHICH ONE of the following describes the availability of a LPCI subsystem to provide injection with flow through a heat exchanger cooled by RHRSW?

| | <u>UNIT 1</u> | <u>UNIT 2</u> |
|----|---------------|---------------|
| A. | Available | Available |
| B. | Available | Not Available |
| C. | Not Available | Available |
| D. | Not Available | Not Available |

Answer: C

Answer Explanation:

ANSWER: Not Available / Available: Correct, Only available power sources are D14 and D21. This results in power to the following available components:

UNIT 1: D14, 1D RHR pump only
UNIT 2: D21, 2A RHR pump, 0C RHRSW pump

1D RHR cannot be aligned to a RHRSW heat exchanger

2A RHR can be aligned through the 2A RHRSW heat exchanger, which can be cooled by the 0C RHRSW pump.

DISTRACTORS:

Available / Available: See Above

Available / Not Available: See Above

NOT Available / NOT Available: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 26 Info | | | |
|--------------------------|---|----------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 4 | | |
| Difficulty: | 4.00 | | |
| System ID: | 5537 | | |
| User-Defined ID: | 5537 | | |
| Cross Reference Number: | NLSRO0655L.04 | | |
| Topic: | Offsite power has been lost to both Unit 1 and Unit 2 at LGS. Only D14 and D21 Emergency Diesel Ge | | |
| RO value: | 4.2 | | |
| SRO Value: | 4.4 | | |
| KA Reference: | 264000 K3.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-1 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Bank | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

27

ID: 23070

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- Core Shuffle Part 2 is in progress
- "2A" ADHR is in service at 6000 gpm

Skimmer Surge Tank level drops to 6' resulting in the following conditions:

- Bubbles are visible in the reactor cavity.
- ARMs on the refuel floor platform are alarming
- RP determine dose rate at the water service is 300 mR/hr
- Refuel HVAC does not isolate

WHICH ONE of the following correctly describes the procedures required to be entered for the above conditions?

- A. ON-120, Fuel Handling Problems
- B. ON-121, Loss of Shutdown Cooling
- C. ON-111, Loss of Secondary Containment
- D. ON-125, Loss of Fuel Pool Cooling

Answer: A

Answer Explanation:

ANSWER: Enter ON-120, AND Evacuate the Refuel Floor: Correct Per ON-120, ARM on the refuel floor platform in alarm requires ON-120 entry

DISTRACTORS

ON-121, Loss of Shutdown Cooling: Incorrect, While ADHR is in a degraded condition, no pump trip will occur due to SST low level, consequently no ON-121 entry is required

ON-111, Loss of Secondary Containment: Incorrect, There is no condition that would result in a RF isolation, and consequently lead to a potential ON-111 Entry.

ON-125, Loss of Fuel Pool Cooling: Incorrect While ADHR is in a degraded condition, there is not a loss of fuel pool cooling, and consequently no ON-125 Entry

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 27 Info | | | |
|--------------------------|---|------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23070 | | |
| User-Defined ID: | 23070 | | |
| Cross Reference Number: | NLSRO01550.01 | | |
| Topic: | SDC entrained air system response and required procedure entr | | |
| RO value: | 4.0 | | |
| SRO Value: | 4.2 | | |
| KA Reference: | 272000 2.4.11 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | ON-120 FH-105 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 43.5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

28

ID: 23096

Points: 1.00

PBAPS Unit 2 plant condition are as follows:

- MODE 2
- Fuel Sipping is being performed in the Unit 2 Spent Fuel Pool with several confirmed leaking Fuel Bundles
- Refuel Floor ventilation is in a normal equipment lineup

The Ventilation Duct Isolation Dampers for the Fuel Pool Scuppers fail closed.

WHICH ONE of the following describes the impact of the closed dampers on the concentration of fission product gases for the Refuel Platform crew?

The concentration of fission product gases will:

- A. go up due to the change in the exhaust air flowpath.
- B. go down due to the automatic start of the Standby Gas Treatment System (SBGT).
- C. remain the same since the Fuel Pool Scupper ventilation is **ONLY** aligned when the Standby Gas Treatment System (SBGT) is in service.
- D. remain the same because the lack of supply air from the scuppers will **NOT** change the concentration of fission product gases coming from the Spent Fuel Pool.

Answer: A

Answer Explanation:

A (go up due to the change in the exhaust air flowpath.) is correct because the ventilation connections at the Fuel Pool Scuppers provide a suction path for the ventilation Exhaust fans which minimizes the amount of exposure to radioactive gases coming from the Fuel Pool / Reactor Cavity. Without this suction path, the radioactive gases will not be drawn away from the Refuel Platform crew and therefore, will contribute to the Refuel Platform airborne radioactive gas concentration.

B (go down due to the automatic start of the Standby Gas Treatment System (SBGT).) is wrong because SBGT treatment does NOT auto start on the closure of these dampers, and even if it did automatically start, without the suction path to the scuppers open there would still be a rise in the airborne radioactive gas concentration for the Refuel Platform crew.

C (remain the same since the Fuel Pool Scupper ventilation is ONLY active when the Standby Gas Treatment System (SBGT) is in service.) is wrong because the ventilation flowpath is active (when dampers are open) and the closing of the dampers will cause radioactive gas from the Fuel Pool / Reactor Cavity to have a higher concentration at the refuel platform is not removed directly from the surface of the water

D (remain the same because the lack of supply air from the scuppers will **NOT** change the amount of fission product gases coming from the Spent Fuel Pool.) is wrong because the ventilation at the scuppers is NOT supply ventilation – but a path to the exhaust fans and will impact the exposure of the crew to fission product gases.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23096 | | |
| User-Defined ID: | 23096 | | |
| Cross Reference Number: | NLSRO-5040B-6 / 234000-43 | | |
| Topic: | PBAPS Fuel Pool Scupper ventilation ducts isolated and impact on rad gas concentrations | | |
| RO value: | 3.1 | | |
| SRO Value: | 3.2 | | |
| KA Reference: | 288000 K5.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-391 sht 1 | Revision #: 34 |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 9 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

29

ID: 22407

Points: 1.00

LGS Plant conditions are as follows:

- Unit 1 is in OPCON 5
- Unit 2 is in OPCON 1
- Zones 1 and 3 are cross-tied for cavity floodup

Unit 2 Reactor Level drops to -50".

WHICH ONE of the following identifies the Zones aligned to SGTS?

- A. Zone 1 only
- B. Zone 2 only
- C. Zones 2 and 3 only
- D. Zones 1, 2, and 3

Answer: B

Answer Explanation:

Answer: Zone 2, only

During normal operation, ventilation is provided to the three major zones of the secondary containment. The zones are:

- Zone I - Unit 1 Reactor Enclosure
- Zone II - Unit 2 Reactor Enclosure
- Zone III - Refuel Floor (Common)
-

Zone Intertie

- During Shutdown for refueling outage, Zone I (II) and Zone III may be interlocked to allow removal of the drywell shield blocks and floodup. While zones are interlocked, an isolation signal on one Zone will also isolate the interlocked zone. (e.g. Zone I isolation will give Zone III isolation and vice versa)

The low level signal on Unit 2 (Zone 2) will isolate Unit 2. It is independent of the other zones and will not effect the Zone 1 and 3 interties.

| REACTOR ENCLOSURE ISOLATION SIGNALS | | | |
|-------------------------------------|---------------|---------------|---------------|
| SIGNAL | DIV 1 | DIV 2 | SETPOINT |
| MANUAL | HS76-*78A | HS76-*78B | Arm & Depress |
| EXH. HI RAD | A and B Inst. | C and D Inst. | 1.35 mR/Hr |
| Low RPV Level/High DW Pressure | A and B Inst. | C and D Inst. | -38", 1.68# |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| | | | |
|--------------------|-----------------|-----------------|---|
| · SGTS Damper Open | HV76-*96 | HV76-*97 | Not full closed |
| · Low Zone DP | A | B | -0.1" WG for 50 min.s (still a vac, but not enough vac) |
| · RF Isolation | Any Div.1 Isol. | Any Div.2 Isol. | * |

Distractors:

Zone 1, only - The low level signal on Unit 2 (Zone 2) will isolate Unit 2 and not effect the Zone 1 and 3 inerties.

Zone 2 and 3, only - The low level signal on Unit 2 (Zone 2) will isolate Unit 2 and not effect the Zone 1 and 3 inerties.

Zone 1, 2 and 3 - The low level signal on Unit 2 (Zone 2) will isolate Unit 2 and not effect the Zone 1 and 3 inerties.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 29 Info | | | |
|--------------------------|---|----------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 22407 | | |
| User-Defined ID: | 22407 | | |
| Cross Reference Number: | NLSRO0190.03 | | |
| Topic: | Describe effect of low level with Zones 1 and 3 cross-tied | | |
| Num Field 1: | 3.7 (3.9) | | |
| Num Field 2: | 3.9 (4.0) | | |
| Text Field: | 290001 K1.04 (A3.01) | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | GP-8 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

30 **OPCON 5** ID: 23071 **Points: 1.00**

LGS Unit 1 plant conditions are as follows:

- OPCON 5
- Fuel Pool Cooling is in service with "1A" and "1B" FPCC Pumps
- The "1A" and "1B" FPCC Heat Exchangers are in service
- Two (2) Fuel Pool Service Water Booster Pumps are in service

A tube leak develops in the "1A" FPCC Heat Exchanger

WHICH ONE of the following describes the plant response?

- A. Skimmer Surge Tank Level will go UP
- B. Plant Service Water Radiation Level will go UP
- C. Fuel Pool Cooling Pumps will trip on Low Skimmer Surge Tank Level
- D. Fuel Pool Service Water Booster Pumps will Trip on Low Suction Pressure

Answer: A

Answer Explanation:

ANSWER: Skimmer surge tank level will go up: Correct as Service Water pressure is higher than Fuel Pool Cooling water pressure, leakage in the "1A" FPCC HXCHR will be from SW to FPCC resulting in Skimmer surge tank level going up

DISTRACTORS:

Fuel Pool Cooling Pumps will trip on Low Skimmer Surge Tank Level: Incorrect, While FPCC pumps do trip on low Skimmer Surge Tank Level, this condition will not occur with the noted leak

Fuel Pool Service Water Booster Pumps will Trip on Low Suction Pressure: Incorrect, Fuel Pool Service Water Booster Pumps take a suction on the Service Water Header, Upstream of the supply to the FPCC HXCHR.

Plant Service Water Radiation Level will go UP: Incorrect, as Service Water pressure is higher than Fuel Pool Cooling water pressure, leakage in the "1A" FPCC HXCHR will be from SW to FPCC

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 30 Info | | | |
|--------------------------|---|---------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23071 | | |
| User-Defined ID: | 23071 | | |
| Cross Reference Number: | NLSRO0750L.09 | | |
| Topic: | Fuel Pool Cooling is in service with "2A" and "2B" FPCC Pumps - The "2A" and "2B" FPCC Heat Exchan | | |
| RO value: | 2.9 | | |
| SRO Value: | 2.9 | | |
| KA Reference: | 400000 K6.06 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | UFSAR 9.2 P&ID M-53 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | Bank | |
| | Question Source: (i.e. New, Bank, Modified) | LGS Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Bank | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

31

ID: 23074

Points: 1.00

LGS Unit 2 conditions are as follows

- OPCON 5
- Fuel Shuffle Part 2 (two) is in progress
- A Double Blade Guide has just been grappled for removal from the core

The oncoming LSRO arrives on the Refuel Platform.

WHICH ONE of the following is the EARLIEST point where he/she can assume the duties of the LSRO?

- A. After the Double Blade guide has been raised to NORMAL UP
- B. When the Double Blade Guide is properly positioned over the its intended target location
- C. When the Double Blade Guide is properly seated in its target location ONLY
- D. When the Double Blade Guide is properly seated in its target location and the grapple is released

Answer: D

Answer Explanation:

ANSWERS: When the Double Blade Guide is properly seated in its target location and the grapple is released: Per FH-105: Turnover shall not take place in the middle of a move involving transfer of a fuel bundle or blade guide, unless warranted by extraordinary circumstances

DISTRACTORS:

After the Double Blade guide has been raised to NORMAL UP: See Above

When the Double Blade Guide is properly positioned over the its intended target location: See Above

When the Double Blade Guide is properly seated in its target location: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 31 Info | | | |
|--------------------------|---|---|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23074 | | |
| User-Defined ID: | 23074 | | |
| Cross Reference Number: | NLSRO1571.04 | | |
| Topic: | Core Alterations are being performed from the Unit 2 Refuel Platform. A bundle has just been grapp | | |
| RO value: | 3.7 | | |
| SRO Value: | 3.9 | | |
| KA Reference: | 2.1.3 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | FH-105 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.10 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | LGS Bank | |
| | Question Source: (i.e. New, Bank, Modified) | Modified | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | Modified to add action as opposed to CCTAS step complete for answer | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

32

ID: 23111

Points: 1.00

PBAPS Unit 2 conditions are as follows:

Surveillance test ST-O-018-125-2 "REFUELING INTERLOCKS FUNCTIONAL TEST WITH THE INABILITY TO MOVE CONTROL RODS" is being performed.

- An LSRO is performing step 6.6.28 to remove of the 120 Volt Wire Jumper installed (via banana plugs) as part of simulating "All Rods In".
- The LSRO is wearing Class "00" gloves.

WHICH ONE of the following identifies the MINIMUM Electrical Safety Personnel Protective Equipment required to remove this jumper?

- A. Safety Glasses ONLY
- B. Class 1 (one) Clothing ONLY
- C. Safety Glasses, AND Class 1 (one) Clothing
- D. Safety Glasses, AND Insulating Sleeves

Answer: C

Answer Explanation:

ANSWER: Safety Glasses, AND Class 1 (one) clothing: is correct as prescribed in SA-AA-129 (table 4 and table 1) removing a jumper, the required electrical safety PPE is Class 1 clothing and safety glasses. (Refer to SA-AA-129 Table 4 item 15 and Table 1')

DISTRACTORS:

Safety Glasses ONLY: Incorrect, while safety glasses are PART of the required PPE Class 1 clothing is also required

Class 1 (one) Clothing ONLY: Incorrect, while class 1 clothing is PART of the required PPE safety glasses are also required

Safety Glasses AND Insulating Sleeves: Incorrect, while safety glasses are PART of the required PPE Class 1 clothing Insulating Sleeves are not required.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 32 Info | | | |
|--------------------------|---|--------------------------|--------------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23111 | | |
| User-Defined ID: | 23111 | | |
| Cross Reference Number: | NLSRO4010.01 | | |
| Topic: | Electrical Safety during bridge checkout | | |
| RO value: | 4.1 | | |
| SRO Value: | 4.0 | | |
| KA Reference: | 2.1.29 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | SO 18.1.C-2 SA-AA-129 | Revision #: 2 6 |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 10 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

33

ID: 23105

Points: 1.00

PBAPS Unit 2 is in a refueling outage with the following conditions:

- Core Shuffle Part II is in progress
- New fuel is being installed into the Reactor Core
- All Control Rods are fully inserted
- "2A" RHR Loop is lined up for Shutdown Cooling
- "2B" RHR Loop is Operable
- "2A" Core Spray Loop is Operable
- "2B" Core Spray Loop is Operable
- Fuel Pool to Reactor Cavity Gates are removed
- Reactor Cavity water level is + 474"

While swapping Shutdown Cooling Pumps a valve failure results in Reactor Cavity water level dropping to + 454" (water level stabilizes at + 454").

WHICH ONE of the following actions **MUST** be performed within one hour of the drop in level (assume Reactor Cavity has **NOT** been refilled)?

- A. Place Standby Gas Treatment System in operation
- B. Initiate action to restore secondary containment to Operable status
- C. Suspend movement of fuel assemblies within the RPV and Spent Fuel Storage Pool
- D. Initiate action to suspend Operations with the Potential to Drain the Reactor Vessel (OPDRVs)

Answer: C

Answer Explanation:

C (Suspend movement of fuel assemblies within the RPV and Spent Fuel Storage Pool) is correct because Tech Spec 3.7.7 and 3.9.6 both specify that movement of fuel assemblies must stop immediately when level is less than +458 inches / 232' 3"

A (Place Standby Gas Treatment System in operation) is wrong because the tech spec for Standby Gas Treatment T.S. 3.6.5 states that a subsystem of SBGT should be placed in operation if moving RECENTLY irradiated fuel (which is NOT the case here) OR if performing OPDRVs (also NOT the case here) so there is no requirement to place SBGT in service during the above conditions.

B (Initiate action to restore secondary containment to Operable status) is wrong because the Tech Spec for Secondary Containment (T.S. 3.6.4) states that secondary containment is required for movement of RECENTLY irradiated fuel OR during OPDRVs (neither event is occurring). NOTE -- By procedure (FH-6C) Secondary Containment will already be operable. Even if Secondary Containment were NOT operable, Tech Specs does NOT require secondary containment unless moving Recently Irradiated Fuel (or OPDRVs)

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

D (Initiate action to suspend Operations with the Potential to Drain the Reactor Vessel (OPDRVs)) is wrong because Tech Specs does not require Reactor Cavity level of > than +458 inches for OPDRVs (however, T.S. does require Secondary Containment and SBGT and two low pressure injection subsystems operable for OPDRVs).

| 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: | 4.00 | | |
| System ID: | 23105 | | |
| User-Defined ID: | 23105 | | |
| Cross Reference Number: | NLSRO-1841-9 / 234000-22 | | |
| Topic: | Knowledge of 1 hour tech specs - determine that Rx level is too low for movement of fuel | | |
| RO value: | 3.9 | | |
| SRO Value: | 4.5 | | |
| KA Reference: | Generic 2.2.39 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | PBAPS Tech Spec 3.7.7 and T.S. 3.9.6 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 10 | 10CFR55.43(b) 2 |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (if appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | Tech Spec 3.7.7 and T.S. 3.9.6 (or the cognitive value of the question is lowered) | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 9 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

34

ID: 23076

Points: 1.00

WHICH ONE of the following describes the LGS Unit 1 and Unit 2 injection points for the alternate injection subsystems listed?

| | <u>Unit 1</u> | <u>Unit 2</u> |
|----|-----------------------------|-----------------------------|
| A. | RHRSW via "A" Loop RHR | RHRSW via "A" Loop RHR |
| B. | RHRSW via "B" Loop RHR | RHRSW via "B" Loop RHR |
| C. | Fire Water via "A" Loop RHR | Fire Water via "B" Loop RHR |
| D. | Fire Water via "B" Loop RHR | Fire Water via "A" Loop RHR |

Answer: D

Answer Explanation:

Answer: Unit 1 = Fire Water via "B" Loop RHR / Unit 2 = Fire Water via "A" Loop RHR Correct:

T-244 ALTERNATE INJECTION FROM THE FIRE SYSTEM utilizes the "B" RHR header for Unit 1 and the "A" RHR header for Unit 2

T-243 ALTERNATE INJECTION BY WAY OF RHRSW TO RHR LOOP "B" for Unit 1 and LOOP "A" for Unit 2

Distracters:

| <u>Unit 1</u> | <u>Unit 2</u> |
|-----------------------------|---|
| RHRSW via "A" Loop RHR | RHRSW via "A" Loop RHR - See Above |
| RHRSW via "B" Loop RHR | RHRSW via "B" Loop RHR - See Above |
| Fire Water via "A" Loop RHR | Fire Water via "B" Loop RHR - See Above |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 34 Info | | | |
|--------------------------|---|--------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23076 | | |
| User-Defined ID: | 23076 | | |
| Cross Reference Number: | NSLRO0685L.05, NSLRO0400L.03 | | |
| Topic: | Identify the Unit 1 and Unit 2 injection points for the alternate injection subsystems | | |
| RO value: | RO 3.1 | | |
| SRO Value: | SRO 3.3 | | |
| KA Reference: | K/A 2.2.3 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | T-243; T-244 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | 02NRC | |
| | Question Source: (i.e. New, Bank, Modified) | Bank | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

35

ID: 23107

Points: 1.00

ATTACHMENT 3

PBAPS Unit 3 is in a refueling outage with plant conditions as follows:

- LSRO is leaving the fuel floor to report to the MCR, and must perform a whole body frisk using an RM-14 Radiation Monitor

Considering the four (4) RM-14 Radiation Monitors shown on Attachment 3, WHICH ONE displays an RM-14 Radiation Monitor that is correctly setup to perform the whole body frisk?

- A. RM-14 "A"
- B. RM-14 "B"
- C. RM-14 "C"
- D. RM-14 "D"

Answer: A

Answer Explanation:

A is correct because the scale multiplier is selected to the X1 range and the instrument Response is set for 'SLOW'

B is wrong because the instrument response is selected to 'FAST'

C is wrong because the scale multiplier is selected to X10

D is wrong because the scale multiplier is selected to X10 & the instrument response is set for 'FAST'

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 35 Info | | | |
|--------------------------|---|-------------------------------------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23107 | | |
| User-Defined ID: | 23107 | | |
| Cross Reference Number: | NLSRO-1760-8 / 295023-7 | | |
| Topic: | Identify which RM-14 is correctly setup to perform a whole body frisk | | |
| RO value: | 2.9 | | |
| SRO Value: | 3.1 | | |
| KA Reference: | Generic 2.3.15 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | RP-AA-350 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 12 10CFR55.43(b) 4 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | Attachment 3 | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | RP-AA-350 | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 9 | |

EXAM MATERIAL

ATTACHMENT 3

Page 1 of 4



RM-14 "A"

EXAM MATERIAL

ATTACHMENT 3

Page 2 of 4

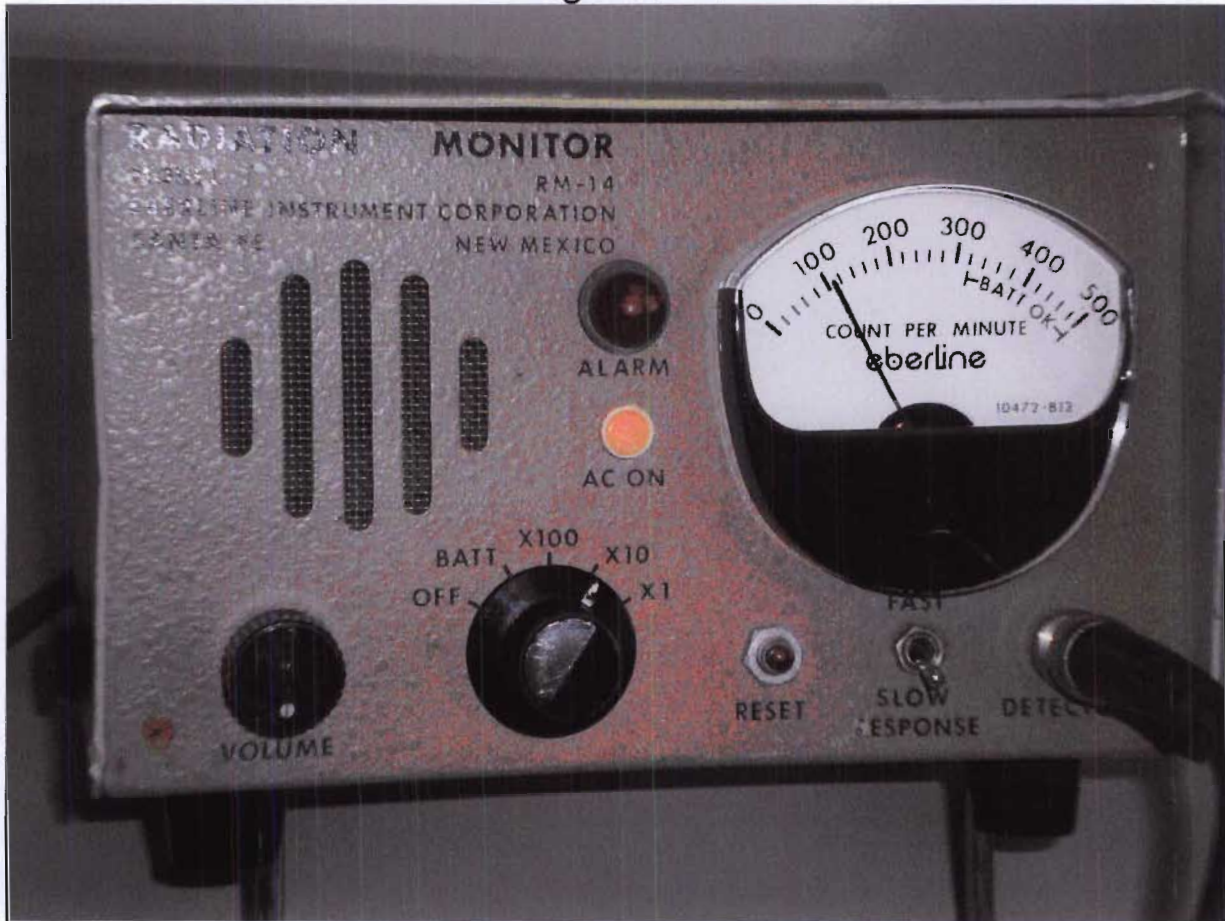


RM-14 "B"

EXAM MATERIAL

ATTACHMENT 3

Page 3 of 4

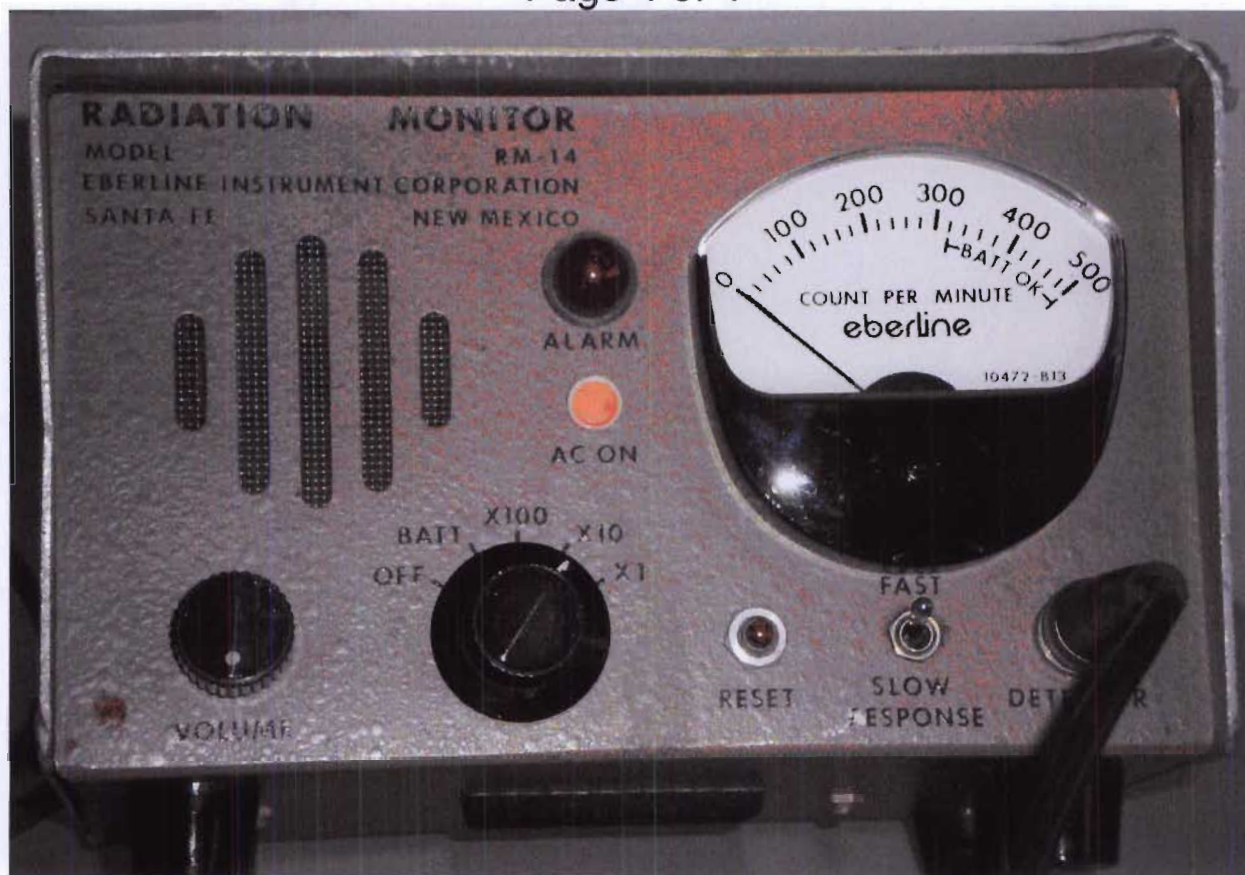


RM-14 "C"

EXAM MATERIAL

ATTACHMENT 3

Page 4 of 4



RM-14 "D"

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

36

ID: 23106

Points: 1.00

PBAPS Unit 3 is in a refueling outage with plant conditions as follows:

- The oncoming Fuel Handling Director (FHD) is told that the Refuel Platform Operator (RPO) received a whole body dose of 155 mrem during 90 minutes of fuel transfers due to Main Hoist contamination levels.

WHICH ONE of the following describes the posting on the Refuel Platform Trolley?

- A. Radiation Area
- B. High Radiation Area
- C. Level 1 Locked High Radiation Area
- D. Level 2 Locked High Radiation Area

Answer: B

Answer Explanation:

B (High Radiation Area) is correct because the criteria for posting a High Radiation Area is receiving a dose equivalent in excess of 0.1 rem in 1 hour at 30 centimeters from the radiation source. The RPO received $155 \text{ mrem}/90 \text{ minutes} = 155 \text{ mrem}/1.5 \text{ hours} = 103 \text{ mrem}/\text{hour} = 0.103 \text{ rem}/\text{hr}$. Since the RPO is just outside the 30 centimeter zone from the Main Hoist, the criteria for posting the Refuel Platform Trolley as a High Radiation Area is met.

A (Radiation Area) is wrong because a person on the Trolley is expected to receive in excess of 100 mrem per hour whole body dose.

C (Level 1 Locked High Radiation Area) is wrong because the criteria for a Locked High Radiation Area is NOT met. The criteria for Level 1 Locked High Rad Area is a dose-rate of more than 1.0 rem/hour (1000 mrem/hr)

D (Level 2 Locked High Radiation Area) is wrong because the criteria for a Locked High Radiation Area is NOT met. The criteria for Level 2 Locked High Rad Area is a dose-rate of more than 15.0 rem/hour (15000 mrem/hr)

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 36 Info | | | |
|--------------------------|---|-------------------|----------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23106 | | |
| User-Defined ID: | 23106 | | |
| Cross Reference Number: | NLSRO-1760-6 / B2-2 | | |
| Topic: | Able to determine High Rad Area posting required due to dose | | |
| RO value: | 3.2 | | |
| SRO Value: | 3.7 | | |
| KA Reference: | Generic 2.3.12 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | RP-AA-460 | Revision #: 19 |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 12 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 9 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

37

ID: 23079

Points: 1.00

An General Area Emergency is declared before TSC staffing is adequate.

WHICH ONE of the following positions performs the function of Emergency Director?

- A. Site Vice President
- B. Plant Manager
- C. Shift Manager
- D. Station Duty Manager

Answer: C

Answer Explanation:

ANSWER: Shift Manager: Correct, Per EP-AA-112-100, the Shift Manager assumes the responsibilities of the ED until relieved by the Station Emergency Director at the TSC. Transfer of command and control occurs only after adequate staffing is present (EP-AA-112).

DISTRACTORS:

Site Vice President: See Above

Plant Manager: See Above

Station Duty Manager: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 37 Info | | | |
|--------------------------|---|-----------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23079 | | |
| User-Defined ID: | 23079 | | |
| Cross Reference Number: | NLSRO1520.03 | | |
| Topic: | GE declared before TSC activation, who is ED | | |
| RO value: | 2.7 | | |
| SRO Value: | 4.5 | | |
| KA Reference: | 2.4.40 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | EP-AA-112 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | 43.5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

38

ID: 23083

Points: 1.00

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- Shuffle part 1 is in progress

The station has been made aware of a potential land-based hostile actions involving a bomb on the Refuel Floor.

WHICH ONE of the following procedures require entry?

- A. SE-8, Fire
- B. SE-3, Sabotage
- C. SE-23, Security Threat
- D. SE-1, Remote Shutdown

Answer: C

Answer Explanation:

ANSWER: SE-23, Security Threat: Correct, SE-23 Entry is required when the station has been made aware of a potential/actual land-based or air-based threat or hostile actions involving explosives, incendiary devices or bombs.

DISTRACTORS:

SE-3, Sabotage: Incorrect, SE-3 entry is required to verify plant safety systems operable **AFTER** a possible sabotage event.

SE-8, Fire: Incorrect: SE-8 entry is required for: Fire reported by phone, radio OR PA, or activation of a Fire alarm. While SE-8 entry may be required as a result of a bomb detonation, and subsequent fire, there is no direction to preemptively enter SE-8

SE-1, Remote Shutdown: Incorrect, SE -1 entry is required in event Main Control Room is uninhabitable
OR fire occurs in: Main Control Room / Cable Spreading Room

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 38 Info | | | |
|--------------------------|---|-------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 2.00 | | |
| System ID: | 23083 | | |
| User-Defined ID: | 23083 | | |
| Cross Reference Number: | NSLRO-SE'S.01 | | |
| Topic: | Core Alterations are being performed from the Unit 2 Refuel Platform. A bundle has just been grapp | | |
| RO value: | 3.2 | | |
| SRO Value: | 4.1 | | |
| KA Reference: | 2.4.28 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | SE-23 | Revision #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 43.5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

39

ID: 23077

Points: 1.00

ATTACHMENT 4

LGS Unit 2 plant conditions are as follows:

- OPCON 5
- Rod Stroking is in progress
- The "2A" CRD pump is in service
- "2A" CRD minimum flow to the CST is 32 gpm

FCV-46-2F00A "CRD Flow Control Station" is in service

- Control Station is in MAN (Manual)
- CRD System Flow is 63 gpm
- HV-46-2F003 "Drive Water Pressure Control Valve" is throttled to maintain Drive Water dP 260 psid above Reactor Pressure

The "2A" CRD minimum flow to the CST becomes blocked resulting in CRD minimum flow dropping to 0 gpm

WHICH ONE of the following describe the impact on CRD System Flow and Drive Water dP?

| | <u>CRD System Flow</u> | <u>Drive Water dP</u> |
|----|------------------------|-----------------------|
| A. | Remains Constant | Remains Constant |
| B. | Remains Constant | Goes Up |
| C. | Goes Up | Remains Constant |
| D. | Goes Up | Goes Up |

Answer: D

Answer Explanation:

Answer:Goes Up / Goes Up: Correct: With CRD FCV in manual a increase in CRD pump flow as caused by the minimum flow failure will result in CRD system flow increasing. This will also result in Drive water dP going up as Drive water dP is maintain by a manual drive water pressure control valve.

IF FCV was in Automatic it would throttle ot maintain system flow constant, which in turn would maintain Drive water dP constant

Distractors:

Remains Constant / Remains Constant: See Above

Remains Constant / Goes Up: See Above

Goes Up / Remains Constant: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23077 | | |
| User-Defined ID: | 23077 | | |
| Cross Reference Number: | NLSRO0070.02 | | |
| Topic: | CRD FCV in manual, Min flow fails closed, impact on System Flow and Drive Water dP | | |
| RO value: | 3.5 | | |
| SRO Value: | 3.7 | | |
| KA Reference: | 291003 K1.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | GFE BANK | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | Attachment 4, M-0046 sht 2 with FCV "FC" blacked out | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | | |
| Low KA Justification (if required): | N/A | | |
| | | | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

40 ID: 23078 Points: 1.00

LGS Unit I plant conditions are as follows:

- Reactor Power was approximately 100% for the last 3 weeks
- Reactor was Scrammed 10 hours ago
- Shutdown Cooling is in service
- Reactor Coolant Temperature is going down

WHICH ONE of the following describes how Reactor Coolant Temperature going down will impact Shutdown Margin?

- A. Adds Negative Reactivity which Decreases Shutdown Margin
- B. Adds Negative Reactivity which Increase Shutdown Margin
- C. Adds Positive Reactivity which Decreases Shutdown Margin
- D. Adds Positive Reactivity which Increases Shutdown Margin

Answer: C

Answer Explanation:

ANSWER: Adds Positive Reactivity which Decreases Shutdown Margin: Correct. As Reactor coolant (moderator) temperature decreases negative reactivity is added which decrease shutdown margin.

DISTRACTORS

Adds Negative Reactivity which Decreases Shutdown Margin: See Above

Adds Negative Reactivity which Increase Shutdown Margin: See Above

Adds Positive Reactivity which Increases Shutdown Margin: See Above

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 40 Info | | | |
|--------------------------|---|----------|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 2 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23078 | | |
| User-Defined ID: | 23078 | | |
| Cross Reference Number: | BR02.09, BR08.03 | | |
| Topic: | Evaluate Change in SDM due to change in plant parameter | | |
| RO value: | 2.6 | | |
| SRO Value: | 2.9 | | |
| KA Reference: | 292002 K1.14 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | GFE BANK | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | RO 41.4 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | | |

KEY POINTS, AIDS, QUESTIONS/ANSWERS

INSTRUCTOR GUIDE

Objective 32

XIII. SHUTDOWN MARGIN

A. Shutdown margin (SDM) is the instantaneous amount of reactivity that core is, or can be made, subcritical from its present condition with most reactive control rod fully withdrawn from core at any time during core cycle.

1. By the definition a SDM exists at all times for a core.
2. Technical Specifications require shutdown margin with the most reactive rod withdrawn from the core.
3. The required shutdown margin varies depending on the mode of operation of the plant.

Objective 33

B. Determining SDM when the Plant is Shut Down

1. When the plant is shutdown, the SDM is usually equal to the amount by which the core is actually subcritical.
 - a. As a result, changes to the plant such as temperature changes or poison concentration changes inevitably change the SDM.
2. Specific details of how SDM is calculated when the reactor is shutdown vary.
 - a. Some plants require that a reactivity balance be performed by the operator to determine that adequate SDM exists.
 - b. This method is much more flexible and often results in a calculated required rod insertion and temperature condition is much less than the conservative value calculated by the other method.
 - c. It generally requires more work and more vigilance on the part of the operators to ensure that SDM requirements are always met.

KEY POINTS, AIDS, QUESTIONS/ANSWERS

INSTRUCTOR GUIDE

2. Any parameter that varies core reactivity causes the shutdown margin to change (e.g., control rod density changes, moderator density changes, poison concentration changes, etc.).
 - a. If the core reactivity becomes less negative, the shutdown margin will decrease.
3. Core design and existing conditions determine the amount of reactivity by which a reactor is actually shutdown.

4. The following parameters or design features will affect shutdown reactivity conditions (SDM):

a. Moderator temperature: An increase in moderator temperature inserts negative reactivity, increasing the shutdown margin.

b. In most conditions core operates as undermoderated (BOL) because resonance escape probability (p) dominates.

$$\text{As } T \uparrow, \rho \downarrow, \frac{N_{\text{mod}} \downarrow}{N_{\text{fuel}} \leftrightarrow}, p \downarrow, k_{\text{eff}} \downarrow,$$

$$\text{SDM} = \frac{(1 - k_{\text{eff}} \downarrow) \uparrow}{k_{\text{eff}} \downarrow}, \text{SDM} \uparrow$$

c. Fuel temperature: An increase in fuel temperature inserts negative reactivity, increasing the shutdown margin.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

41 ID: 23090 Points: 1.00

PBAPS Plant conditions are as follows:

- The E-3 Emergency Diesel Generator (EDG) is blocked for maintenance

A fire results in the following:

- The #1 Station Auxiliary Bus is De-energized
- The #2 Station Auxiliary Bus is De-energized

WHICH ONE of the following describes the electrical power supplies to the PBAPS Unit 2 **AND** Unit 3 Refuel Platforms?

| | <u>Unit 2 Refuel Platform</u> | <u>Unit 3 Refuel Platform</u> |
|----|-------------------------------|-------------------------------|
| A. | Power Available | Power Available |
| B. | Power Available | NO Power Available |
| C. | NO Power Available | Power Available |
| D. | NO Power Available | NO Power Available |

Answer: A

Answer Explanation:

A (Power Available / Power Available) is correct since both the Unit 2 and Unit 3 Refuel Platforms are fed from Emergency Buses. Under a normal electrical lineup, Both Unit 2 and Unit 3 are fed from the E42/E43 Electrical Bus. Both the E42 and the E43 Bus are fed from the E-4 Emergency Diesel Generator and therefore would have power available during this transient. NOTE This would NOT be the correct answer at Limerick Generating Station (The Limerick Refuel Platforms are powered from Station Auxiliary power).

B (Power Available / NO Power Available) is wrong because the Unit 3 Refuel Platform would have electrical power available

C (NO Power Available / Power Available) is wrong because the Unit 2 Refuel Platform would have electrical power available

D (NO Power Available / NO Power Available) is wrong because both Refuel Platforms will have electrical power available – NOTE this is the correct answer for Limerick .

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23090 | | |
| User-Defined ID: | 23090 | | |
| Cross Reference Number: | NLSRO-5054-2 / 234000-47 | | |
| Topic: | Power supply to the PBAPS Unit 2 & Unit 3 Refuel Platforms on loss of Aux power | | |
| RO value: | 3.1 | | |
| SRO Value: | 3.2 | | |
| KA Reference: | 295003 AK1.04 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | E-1, E-1617 | Revision #: 4564 |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | Y | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b)8 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 6 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

42

ID: 23092

Points: 1.00

PBAPS Unit 2 Plant Conditions are as follows:

- Mode 5
- Reactor Cavity water level is +474 inches
- All Core Spray Pumps have been removed from service for maintenance
- The 2A RHR Pump is lined up for Shutdown Cooling
- The 2C RHR Pump is available (in standby)
- The 2B and 2D RHR Pumps have been removed from service
- The Tech Spec 3.9.7 RHR – High Water Level LCO (One RHR Shutdown Cooling Subsystem shall be operable and in Operation) is met

The 2A RHR Heat Exchanger develops excessive leakage and MUST be mechanically isolated.

Which ONE of the following describes the status of the following PBAPS Unit 2 LCO 3.9.7 AND the reason for the LCO status when the 2A Heat Exchanger is isolated?

| | <u>Status of Tech Spec 3.9.7 LCO</u> | <u>Reason For Status</u> |
|----|--------------------------------------|--|
| A. | MET | Shutdown Cooling CAN be provided by the 2C RHR Pump |
| B. | MET | The RHR Heat Exchangers are NOT part of a Shutdown Cooling Subsystem |
| C. | NOT MET | The 2A RHR Heat Exchanger is INOPERABLE |
| D. | NOT MET | The 2B RHR Loop Heat Exchangers can NOT be used with the 2A RHR Loop Pumps |

Answer: A

Answer Explanation:

Answer: MET / Shutdown Cooling CAN be provided by the 2C RHR Pump: is correct because the 2C RHR Pump and the 2C RHR Heat Exchanger make up an Operable Shutdown Cooling Subsystem.

DISTRACTORS:

MET / The RHR Heat Exchangers are NOT Part of a Shutdown Cooling Subsystem: wrong because the RHR Heat Exchangers are required for an Operable Shutdown Cooling Subsystem

NOT MET / The 2A RHR Heat Exchanger is INOPERABLE: wrong because there is an Operable Shutdown Cooling Subsystem and the LCO is met

NOT MET / The 2B RHR Loop Heat Exchangers can NOT be used with the 2A RHR Loop Pumps: wrong because there is an Operable Shutdown Cooling Subsystem and the LCO is met

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 4.00 | | |
| System ID: | 23092 | | |
| User-Defined ID: | 23092 | | |
| Cross Reference Number: | NLSRO-1841-7 / 234000-6 | | |
| Topic: | Recognize entry level conditions for PBAPS Tech Specs ECCS & SDC | | |
| RO value: | 3.9 | | |
| SRO Value: | 4.6 | | |
| KA Reference: | 295021 G2.2.42 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | PBAPS U2 T.S.and Bases 3.5.2 and 3.9.7 | Rev #: Amend 259/ Amend 210 |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.43 (b) 2 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | Do not provide T.S. Bases | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 4 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

43 ID: 23115 Points: 1.00

PBAPS Unit 3 plant conditions are as follows:

- Mode 3 preparing for a refueling outage
- Reactor Pressure 800 psig

Five minutes after a steam leak occurs in the Unit 3 Reactor Building on the 195' elevation, the following indications are present:

- Reactor Building Exhaust Ventilation Radiation Monitors (RIS-3-17-452A, B, C, D) indicate 22 mr/hour
- Refuel Floor Exhaust Ventilation Radiation Monitors (RIS-3-17-458A, B, C, D) indicate 6 mr/hour

WHICH ONE of the following describes the Reactor Building (Rx Bldg) AND Refuel Floor Exh. Ventilation radiation indications?

**Rx Bldg Exhaust Ventilation
Rad Monitor Indications are:**

**Refuel Floor Exhaust Ventilation
Rad Monitor Indications are:**

- | | | |
|----|-----------------------------------|-----------------------------------|
| A. | VALID Indications of exh. air | VALID Indications of exh. air |
| B. | VALID Indications of exh. air | NOT VALID Indications of exh. air |
| C. | NOT VALID Indications of exh. air | VALID Indications of exh. air |
| D. | NOT VALID Indications of exh. air | NOT VALID Indications of exh. air |

Answer: D

Answer Explanation:

D (NOT VALID Indications of exhaust air/ NOT VALID Indications of exhaust air) is correct because when the Reactor Building Vent Exhaust rad monitors picked up > than 10mr/hr, the normal ventilation system isolated (Both Reactor Building AND Refuel Floor) and SBTG started and aligned to both the Reactor Building AND the Refuel Floor. Therefore, these rad monitors (for both the Reactor Building AND the Refuel Floor) are located at ducts that are isolated (no exhaust air flow) and therefore these rad monitors are NOT accurate indicators of exhaust air (which is going through the SBTG system). NOTE -- This is a different lineup than would occur at Limerick under similar circumstances. At Limerick, the Reactor Building would isolate however, the Refuel Enclosure would remain on a normal ventilation lineup.

A (VALID / VALID) is wrong because neither the Reactor Building or the Refuel Floor ventilation systems are in-service (normal ventilation is isolated and SBTG is being used to maintain a negative Building / Enclosure D/P).

B (VALID / NOT VALID) is wrong because the Reactor Building normal ventilation system is isolated and therefore these rad monitors are not giving an accurate indication of the Reactor Building Exhaust air radiation levels.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

C (NOT VALID / VALID) is wrong because the Refuel Floor Ventilation system will isolate on a Reactor Building high exhaust radiation condition and therefore the Refuel Floor Rad Monitors are NOT giving an accurate indication of the radiation content of the exhaust air. NOTE - This would be the correct answer if this situation were to occur at Limerick.

| 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: | 3.00 | | |
| System ID: | 23115 | | |
| User-Defined ID: | 23115 | | |
| Cross Reference Number: | NLSRO5040B-2 / 234000-4 | | |
| Topic: | PBAPS Reactor Building and Refuel Floor Exhaust Rad monitor indication and Accuracy | | |
| RO value: | 3.8 | | |
| SRO Value: | 4.2 | | |
| KA Reference: | 295034 EA2.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-391 sht 2 ARC-318 D-4 GP-8D | Rev #: |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41 (b) 7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 9 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

44

ID: 23091

Points: 1.00

PBAPS Unit 3 conditions are as follows:

- MODE 5
- During turnover the on-coming LSRO observes the following in the Main Control Room:
 - Full Core Display Indications for Control Rod 30-31:
 - Displays a '00'.
 - Numeric display is in 'red'
 - 'blue' 'SCRAM' light is lit
 - 'red' 'ACCUM' light is lit
 - Both Control Rod Drive Pumps are off
 - Reactor Pressure is '0' psig

WHICH ONE of the following describes the position of the 30-31 Control Rod?

- A. Fully inserted into the Core based on the 'blue SCRAM' light lit
- B. Fully withdrawn out of the Core based on the 'red ACCUM' light lit
- C. Fully inserted into the Core based on the RPIS red color "00" indication
- D. Control Rod position is unknown based on the conflicting RPIS 'red 00' indication

Answer: D

Answer Explanation:

D [unknown (there is a position indication problem for the Control Rod)] is correct because the magnetic pick up micro-switches that are part of the PIP should give a green '00' for a full in control rod. NOTE that if one of the switches was not made up, there would be an AMBER '00' indication. Therefore, there is a PIP problem (RED indication corresponds to a rod that is full OUT --> therefore an RPIS problem). There is a SCRAM condition present for the 30-31 control rod (Scram Inlet and Outlet Valves are open), however, there is NO driving flow for the control rod to insert into the core (CRD PPs are off, Reactor pressure is low, and an Accumulator Low pressure alarm is up for Control Rod 30-31). NOTE – At Limerick, there is NO notch position indication on the Full Core Display.

A (fully inserted into the Core) is wrong because there is conflicting rod position indication from the Full Core Display – '00' indicates full in HOWEVER the 'red' indication is for a rod that is full OUT. The fact that the Scram Valve are open (Blue SCRAM light lit) has no meaning without hydraulic pressure (no CRD Pumps and NO Reactor pressure)

B (fully withdrawn out of the Core) is wrong because there is conflicting rod position indication from the Full Core display – '00' indicates full in HOWEVER the 'red' indication is for a rod that is full OUT.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

C (Fully inserted into the Core based on the RPIS "00" indication) is wrong because there is conflicting rod position indication from the Full Core display – '00' does indicate full in HOWEVER the 'red' indication is for a rod that is full OUT.

| 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: | 3.00 | | |
| System ID: | 23091 | | |
| User-Defined ID: | 23091 | | |
| Cross Reference Number: | NLSRO-5003-4 / 234000-4 | | |
| Topic: | Control Rod Position indication and the PBAPS Full Core display | | |
| RO value: | 4.3 | | |
| SRO Value: | 4.4 | | |
| KA Reference: | 295006 AA2.02 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-1-S-20 sht 8 GE 104B2506 sht 2 | Revision #: 50 0 |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b)10 10CFR55.43(b)5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 1 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

45

ID: 23089

Points: 1.00

PBAPS Unit 2 plant conditions are as follows:

- MODE 5
- Reactor Cavity water level is +474"
- Control Rod Drive Exchanges are in progress
- "2A" Loop of RHR is blocked for maintenance
- "2B" Loop of RHR is in Shutdown Cooling
- "2A" Loop of Core Spray is Operable
- "2B" Loop of Core Spray is blocked for maintenance

A Control Rod Drive is removed from a Control Cell that already has the Control Rod Blade removed.

WHICH ONE of the following describes the impact of the Control Rod Drive removal on Reactor Cavity water level assuming **NO** Operator action?

Reactor Cavity water level will lower to:

- A. The bottom of the Reactor Cavity to Fuel Pool Gates and then remain steady.
- B. Approximately the + 1" point and then remain steady.
- C. Approximately the -160" point and then begin to rise.
- D. The 2/3 Core Coverage point (Top of Jet Pump Mixer sections) and then begin to rise.

Answer: C

Answer Explanation:

C (approximately the -160 inch point and then begin to rise.) is correct because the water leak will drain water from the Reactor Cavity into the drywell and then back into the Torus. Water will drain and level will continue to go down until the ECCS initiation setpoint is reached (-160 inches) and then the 'A' Loop of Core Spray will inject 6000 gallons per minute into the Reactor Cavity which will raise level to +474 inches (in fact, level will raise above that and end up flowing out of the Fuel Pool/Reactor Cavity).

A (the bottom of the Reactor Cavity to Fuel Pool Gates and then remain steady) is wrong because the Reactor Cavity Water level will continue to go down past the bottom of the Fuel Pool Gates (Fuel Pool water level will stop lowering at this point).

B (approximately the + 1 inch point and then remain steady at approximately +1 inch) is wrong because the Reactor Cavity water level will continue to go down past the +1 inch point (Shutdown Cooling will isolate) but the Group 2 isolations will NOT stop the leak.

D (the 2/3 Core Coverage point (Top of Jet Pump Mixer sections) and then begin to rise) is wrong because the Core Spray system will NOT permit the Cavity Water level to get down to the -226 inch point.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | |
| System ID: | 23089 | |
| User-Defined ID: | 23089 | |
| Cross Reference Number: | NLSRO-5014-5 / 295023-1 | |
| Topic: | Removing CRD and CRB from same control cell will result in water level going to | |
| RO value: | 4.2 | |
| SRO Value: | 4.3 | |
| KA Reference: | 295031 EK2.03 | |
| Comments: | General Data | |
| | Technical Reference with Revision Number: | M-1-B-65 shts 2 & 4 M-1-S-40 shts 2-->5 M-1-S-65 shts 2,3,4 M-361 sht 1 GP-8B M-362 sht 1 |
| | | Revision #: 0/0 51/49/5 1/52 99/95/9 5 81 18 62 |
| | Cognitive Level | H |
| | PRA: (i.e. Yes or No or #) | N |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b)7 |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New |
| | Question Source: (i.e. New, Bank, Modified) | New |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None |
| | Low KA Justification (if required): | N/A |
| | | Safety Function 2 |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

46

ID: 23102

Points: 1.00

PBAPS Unit 3 is in a refueling outage with plant conditions as follows:

- The "3C" RHR Pump is in Shutdown Cooling
- The "3C" HPSW Pump lined up to the "3C" RHR Heat Exchanger
- Reactor water temperature is 110°F and steady

The HPSW Outlet Valve on the out-of-service "3A" RHR Heat Exchanger fails open.

WHICH ONE of the following describes the impact of the valve failure on the Shutdown Cooling system? (Assume **NO** Operator action)

| <u>Total HPSW System Flow</u> | <u>Reactor water temperature</u> |
|-------------------------------|----------------------------------|
| A. Down | Down |
| B. Down | Up |
| C. Up | Down |
| D. Up | Up |

Answer: D

Answer Explanation:

D (UP / Up) is correct because the failure of the 'A' HX outlet valve will allow system head (resistance) to go down and allow more SYSTEM flow (NOTE – There is LESS 'C' HX flow). With less cooling water going through the 'C' HX (due to being diverted through the 'A' HX), the heat removal function is reduced and the Reactor Cavity water temperature will go up. NOTE – Limerick does NOT have two RHR HXs in each RHR loop and therefore does NOT control Cavity temperature by splitting the HPSW flow between two HXs (one in service and one NOT in service).

A (Down / Down) is wrong because the total HPSW System flow will go up AND because the reduction in flow HPSW flow through the 'C' HX will result in Cavity water temperature going Up.

B (Down / Up) is wrong because the total HPSW System flow will go up with the additional flowpath.

C (Up / Down) is wrong because the reduction in HPSW through the 'C' HX will result in Cavity water temperature going up (NOT down).

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 46 Info | | | |
|--------------------------|---|-----------------------------|-------------------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 3 | | |
| Difficulty: | 3.00 | | |
| System ID: | 23102 | | |
| User-Defined ID: | 23102 | | |
| Cross Reference Number: | NLSRO-5010-2 / 295023-3 | | |
| Topic: | PBAPS HPSW valve failure and how it impacts SDC and Rx water temperature | | |
| RO value: | 3.5 | | |
| SRO Value: | 3.6 | | |
| KA Reference: | 205000 K1.15 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | M-361sht 3/4 M-315 sht 3 | Revision #: 68/68 53 |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 4 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | New | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 4 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

47 ID: 23099 Points: 1.00

PBAPS Unit 3 is in a refueling outage with plant conditions as follows:

Activities are occurring in preparation for remove the Control Rod Blade (CRB) at location 18-37:

- Refuel Platform is positioned over CRB 18-37
- All Refuel Platform Hoists are unloaded
- The undervessel crew has reported difficulty in uncoupling the CRD 18-37
- The CRB 18-37 Coupling Handle has just been actuated by the RPO per M-C-741-301 "Control Rod Blade, FSP and Control Rod Guide Tube Removal and Installation"
- The Refuel Platform 'STOP' pushbutton is depressed

AFTER the Refuel Platform 'STOP' pushbutton is depressed, THEN the Reactor Operator applies a continuous withdraw signal to Control Rod 18-37 while the undervessel crew attempts uncoupling.

The following indications are observed:

- The CRB raised slightly and has now settled to a lower position
- CRD 18-37 "Rod Overtravel" Annunciator is lit in the MCR
- "Rod Block Interlock #1" Annunciator is Lit

WHICH ONE of the following actions should be directed by the Fuel Handling Director?

- A. Re-attempt uncoupling of Control Rod 30-31 from under Vessel using M-C-741-301 "Control Rod Blade, FSP and Control Rod Guide Tube Removal and Installation"
- B. Re-attempt uncoupling of Control Rod 30-31 from above Vessel using M-C-741-301 "Control Rod Blade, FSP and Control Rod Guide Tube Removal and Installation"
- C. Move Control Rod Blade 30-31 when the Refuel Platform is restarted in accordance with SO 18.1.C-3 "Electrical, Mechanical and Pneumatic Alignment / Checkout of Refueling Platform"
- D. Stop ALL Core Component moves until the Refuel Platform Interlocks are verified operable per ST-O-018-120-3 "Refueling Interlocks Functional Test with the Ability to Move Control Rods"

Answer: D

Answer Explanation:

D (Stop ALL Core Component moves until the Refuel Platform Interlocks are verified operable per ST-O-018-120-3 "Refueling Interlocks Functional Test with the Ability to Move Control Rods") is correct since depressing the "STOP" push button with the Refuel Platform over the core should bring in a 'Rod Interlock Block #1' (even though Hoists are unloaded). Since the Control Rod was able to be withdrawn with the 'STOP' push Button depressed, There is a failure of the 'Rod Interlock Block #1' circuitry. Therefore, Core Alterations should be suspended until the Refuel Interlocks are verified to be operating correctly. NOTE – At Limerick, depressing the "STOP" push button does NOT bring in the 'Rod Interlock Block #1'.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

A (Re-attempt uncoupling of Control Rod 30-31 from under Vessel using M-C-741-301 "Control Rod Blade, FSP and Control Rod Guide Tube Removal and Installation") is wrong because the Control Rod Blade is uncoupled.

B (Re-attempt uncoupling of Control Rod 30-31 from above Vessel using M-C-741-301 "Control Rod Blade, FSP and Control Rod Guide Tube Removal and Installation") is wrong because the Control Rod Blade is uncoupled.

C (Move Control Rod Blade 30-31 when the Refuel Platform is restarted in accordance with SO 18.1.C-3 "Electrical, Mechanical and Pneumatic Alignment / Checkout of Refueling Platform") is wrong because the Control Rod Blade should NOT be moved until the Refuel Interlocks are verified Operable.

| Question 47 Info | | | |
|--------------------------|---|--|-------------|
| Question Type: | Multiple Choice | | |
| Status: | Active | | |
| Always select on test? | No | | |
| Authorized for practice? | No | | |
| Points: | 1.00 | | |
| Time to Complete: | 4 | | |
| Difficulty: | 4.00 | | |
| System ID: | 23099 | | |
| User-Defined ID: | 23099 | | |
| Cross Reference Number: | NLSRO-0762-9 / 234000-19 | | |
| Topic: | PBAPS - Identify failure of the the Rod Block Interlock #1 and provide direction | | |
| RO value: | 3.3 | | |
| SRO Value: | 3.7 | | |
| KA Reference: | 234000 A2.01 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | SO 18.1.A-3 attachment 1 M-1-S-20 326-P-VC-1 | Revision #: |
| | Cognitive Level | H | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 5 // 10CFR55.43(b) 5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

48 ID: 23098 Points: 1.00

PBAPS Unit 2 is in a refueling outage with plant conditions as follows:

- Core Shuffle Part II is complete
- Vessel Re-assembly is in progress
- Reactor Building Ventilation is in a normal lineup
- Refuel Floor Ventilation is in a normal lineup

Reactor Level Instrumentation failure results in low reactor water level -10" indication on all Wide Range Level instruments.

WHICH ONE of the following describes the Unit 2 ventilation lineup (assume **NO** Operator action)?

Unit 2 Reactor Building Ventilation from:

Unit 2 Refuel Floor Ventilation from:

- | | |
|---------------------------------|------------------------------|
| A. Normal HVAC | Normal HVAC |
| B. Normal HVAC | Standby Gas Treatment (SBGT) |
| C. Standby Gas Treatment (SBGT) | Normal HVAC |
| D. Standby Gas Treatment (SBGT) | Standby Gas Treatment (SBGT) |

Answer: D

Answer Explanation:

D (Standby Gas Treatment (SBGT) / Standby Gas Treatment (SBGT)) is correct because an indication of less than or equal to + 1 inch will result in a Group 2 isolation which includes putting both the Unit 2 Reactor Building AND the Unit 2 Refuel Floor on the Standby Gas Treatment system. NOTE – This would NOT be the case at Limerick. The low Reactor water level signal at Limerick will result in the Reactor Building ventilation going to SBGT, However, the Refuel Containment would NOT be affected (would remain on Normal HVAC).

A (Normal HVAC / Normal HVAC) is wrong because the setpoint for the Group 2 isolation is +1 inch, and since that is met the normal ventilation (for Reactor Building & Refuel Floor) will isolate and the SBGT will start and draw on both areas.

B (Normal HVAC / Standby Gas Treatment (SBGT)) is wrong because the SBGT system will start and draw on the Unit 2 Reactor Building

C (Standby Gas Treatment (SBGT) / Normal HVAC) is wrong because the SBGT system will start and draw on the Unit 2 Refuel Floor NOTE – This would be the correct answer if this were to occur at Limerick.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23098 | | |
| User-Defined ID: | 23098 | | |
| Cross Reference Number: | NLSRO-5040B-5 | | |
| Topic: | PBAPS Refuel Floor and Rx Building Ventilation lineup from an INVALID low level indication | | |
| RO value: | 2.8 | | |
| SRO Value: | 2.9 | | |
| KA Reference: | 223002 K6.06 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | GP-8B | Revision #: 18 |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New | |
| | Question Source: (i.e. New, Bank, Modified) | New | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (if appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 5 | |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

49

ID: 23100

Points: 1.00

PBAPS plant conditions are as follows:

- Unit 2 is in a refueling outage
- Unit 3 is shutdown and depressurized for a forced maintenance outage
- **ALL** Low Pressure ECCS subsystems are in a normal lineup
- A Loss of offsite power has occurred
- The E-4 Emergency Diesel Generator (EDG) is the **ONLY** EDG that is running

WHICH ONE of the following describes the ability of the Low Pressure ECCS systems to automatically inject water into the Reactor Vessel on a low water level condition (assume **NO** Operator actions)?

PBAPS Unit 2 Automatic ECCS Injection

PBAPS Unit 3 Automatic ECCS Injection

- | | |
|------------------|---------------|
| A. Available | Available |
| B. Available | NOT Available |
| C. NOT Available | Available |
| D. NOT Available | NOT Available |

Answer: A

Answer Explanation:

A (Available / Available) is correct because the E-4 EDG powers both Unit 2 AND Unit 3 ECCS -- The Unit 2 B Loop C/S valves (and one pump) and the Unit 3 B Loop RHR valves (and one pump). Logic circuits are powered off of batteries. NOTE – This would NOT be the case at Limerick. A single Limerick EDG does NOT power Unit 1 & Unit 2 ECCS equipment.

B (Available / NOT Available) is wrong because Unit 3 B Loop RHR is available for automatic injection

C (NOT Available / Available) is wrong because Unit 2 B Loop RHR AND B Loop Core Spray are available for auto inject.

D (NOT Available / NOT Available) is wrong because Both Unit 2 AND Unit 3 ECCS is available for automatic injection

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| Question 49 Info | | |
|--------------------------|---|---|
| Question Type: | Multiple Choice | |
| Status: | Active | |
| Always select on test? | No | |
| Authorized for practice? | No | |
| Points: | 1.00 | |
| Time to Complete: | 2 | |
| Difficulty: | 3.00 | |
| System ID: | 23100 | |
| User-Defined ID: | 23100 | |
| Cross Reference Number: | NLSRO-5054-2 / 234000-47 | |
| Topic: | PBAPS Unit 2 & Unit 3 --- Given ONE EDG operating (LOOP), determine ECCS capability | |
| RO value: | 4.2 | |
| SRO Value: | 4.4 | |
| KA Reference: | 264000 K3.01 | |
| Comments: | General Data | |
| | Technical Reference with Revision Number: | E-1 sht 1 E-1617 sht 1 E-1717 sht 1 |
| | | Revision #:45 64 60 |
| | Cognitive Level | L |
| | PRA: (i.e. Yes or No or #) | N |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 7 |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | New |
| | Question Source: (i.e. New, Bank, Modified) | New |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | None |
| | Low KA Justification (if required): | N/A |
| | | Safety Function 6 |

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

50

ID: 23117

Points: 1.00

PBAPS Unit 2 is in a refueling outage with plant conditions are as follows:

- Core Shuffle Part I is in progress
- An irradiated Fuel Assembly is being moved to a Spent Fuel Rack near the Cask Pit

Concurrent with the Fuel Assembly being lowered into the specified rack location, the 20C075 C-1 'Fuel Storage Pool Hi Radiation' alarm comes in.

WHICH ONE of the following describes the location of the Spent Fuel Pool Radiation Monitor AND the required procedure entry?

| | <u>Location of SFP Radiation Monitor</u> | <u>Required Procedure Entry</u> |
|----|--|--|
| A. | North Wall SFP | ON-124 'Fuel Floor and Fuel Handling Problems' |
| B. | South Wall SFP | ON-124 'Fuel Floor and Fuel Handling Problems' |
| C. | North Wall SFP | GP-15 'Local Evacuation' |
| D. | South Wall SFP | GP-15 'Local Evacuation' |

Answer: A

Answer Explanation:

A is correct (North Wall SFP / ON-124 'Fuel Floor and Fuel Handling Problems') because the SFP Rad Monitor is located on the North Wall of the Spent Fuel Pool (by CRB Racks) AND since the CASK PIT is NOT close to the Rad Monitor, the correct procedure to cover the unexpected Rad Monitor Alarm is ON-124 (per ARC-20C075 C-1)

B is wrong (South Wall SFP / ON-124 'Fuel Floor and Fuel Handling Problems') because the Unit 2 SFP Rad Monitor is on the North Wall. NOTE - This would be the correct answer if this event were to occur on PBAPS Unit 3.

C is wrong (North Wall SFP / GP-15 'Local Evacuation') because this procedure would be entered on an unexpected ARM alarm (The SFP Rad Monitor is NOT an ARM (Area Radiation Monitor)).

D is wrong (South Wall SFP / GP-15 'local Evacuation') because the SFP Rad Monitor is located on the North Wall of the Unit 2 SFP AND because the GP-15 procedure would NOT be entered in this situation unless an ARM were to alarm as well.

EXAMINATION ANSWER KEY

NRC LSRO 10-1 QUESTIONS IN SAMPLE PLAN ORDER

| 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: | 3.00 | | |
| System ID: | 23117 | | |
| User-Defined ID: | 23117 | | |
| Cross Reference Number: | NLSRO-1550-1 / 295023-7 | | |
| Topic: | PBAPS Hi Spent Fuel Pool Rad Monitor alarm during Shuffle Part I | | |
| RO value: | 4.0 | | |
| SRO Value: | 4.2 | | |
| KA Reference: | 272000 G2.4.11 | | |
| Comments: | General Data | | |
| | Technical Reference with Revision Number: | ARC 20C075 C-1 & ARC 218 C-1 ON-124 AG-CG-132 Exhibit 3 | Revision #: 4 1 14 1 |
| | Cognitive Level | L | |
| | PRA: (i.e. Yes or No or #) | N | |
| | 10CFR55.43 (n/a for RO) | 10CFR55.41(b) 10 10CFR55.43(b) 5 | |
| | Question History: (i.e. LGS NRC-05, OYS CERT-04) | NEW | |
| | Question Source: (i.e. New, Bank, Modified) | NEW | |
| | Revision History: Revision History: (i.e. Modified distractor "b" to make plausible based on OTPS review) | | |
| | Supplied Ref (If appropriate): (i.e. ABN-##) | None | |
| | Excluded Reference: (i.e. Ensure ON-## not provided) | ARC 20C075 C-1 ON-124 | |
| | Low KA Justification (if required): | N/A | |
| | | Safety Function 7 | |