

Final Submittal
VOGTLE MAY 2005 EXAM
50-424, 425/2005-301

MAY 17 - 25, 2005
MAY 27, 2005 (WRITTEN)

Combined RO/SRO Written Exam with KAs,
Answers, References, and Analysis

1. 001K2.01 001/2/2/CONTROL ROD DRIVE/MEM 3.5/M/VG05301/R/MAB/RSB

Which ONE of the following correctly states the order of components through which 480 VAC to 260 VAC power flows to the Control Rod Drive Mechanisms?

- A. Motor Starting Breakers, then Motor Generator Sets, then Power Cabinets, then Reactor Trip Breakers
- B. Power Cabinets, then Motor Starting Breakers, then Motor Generator Sets, then Reactor Trip Breakers
- C. Motor Starting Breakers, then Motor Generator Sets, then Reactor Trip Breakers, then Power Cabinets
- D. Motor Generator Sets, then Motor Starting Breakers, then Reactor Trip Breakers, then Power Cabinets

K/A

001 Control Rod Drive

K2.01 Knowledge of bus power supplies to the following: One-line diagram of power supply to M/G sets.

K/A MATCH ANALYSIS

Question tests knowledge of the power supplies to the M/G Sets at the memory level.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Plausible because all parts of the correct answer are listed, but in an incorrect order.
- B. Incorrect. Plausible because all parts of the correct answer are listed, but in an incorrect order.
- C. Correct. See Reference 1, Page 9.
- D. Incorrect. Plausible because all parts of the correct answer are listed, but in an incorrect order. This choice would be correct if "Motor Breakers" were replaced with "Generator Breakers".

REFERENCES

- 1. Vogtle Lesson Plan, LO-LP-27101, Rod Control System.
- 2. Vogtle Exam Bank Question, LO-LP-27101-03-02

2. 002G2.4.31 001/2/2/RCP VIBRATIONS/MEM 3.3/N/VG05301/R/MAB/RSB

ALB08-F03, RCP FRAME HI VIBRATION, is in alarm with both RCP #1 frame vibration channels reading 10 mils.

Which ONE of the following correctly describes the required actions?

- A✓ The alarm is valid, secure RCP #1.
- B. Continue operation of RCP #1 and frequently monitor vibrations.
- C. The alarm is invalid; therefore, RCP #1 may continue to run without any increased monitoring of vibrations.
- D. Secure RCP #1 ONLY if vibration rate of increase exceeds 0.2 mils per hour.

K/A

002 Reactor Coolant

G2.4.31 Knowledge of annunciators, alarms, and indications, and use of the response instructions.

K/A MATCH ANALYSIS

Question tests a memory item wrt the vibration level at which an RCP must be secured. The guidance exists in the ARPs.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. ALB08-F03 states that RCP must be secured when 5 mils Frame Vibe is exceeded. The subsequent actions has the operator attempt a reset of the alarm, but this is not required knowledge to answer the question. The question requires only one memory item in order to get the correct answer - RCP trip criteria.
- B. Incorrect. RCP must be tripped. Plausible because this would be the correct answer if a RCP FRAME VIBRATION ALERT alarm was in.
- C. Incorrect. Alarm is valid as evidenced by both channels indicating the alarm. Plausible because the Shaft Vibration alarms are 15 and 20 mils, therefore the applicant may get them confused.
- D. Incorrect. RCP must be secured even if there is no rate of increase and the question clearly states ONLY if there is a rate of increase. Plausible because this is the guidance given in RCP FRAME VIBRATION ALERT alarm.

REFERENCES

- 1. ALB08-E03, RCP FRAME VIBRATION ALERT, Rev. 13.1, 01/01/2004.
- 2. ALB08-E04, RCP SHAFT VIBRATION ALERT, Rev. 13.1, 01/01/2004.
- 3. ALB08-F03, RCP FRAME HI VIBRATION, Rev. 13.1, 01/01/2004.
- 4. ALB08-F04, RCP SHAFT HI VIBRATION, Rev. 13.1, 01/01/2004.

3. 003K5.03 001/2/1/RCP TAVE TAVG/C/A 3.1/M/VG05301/R/MAB/RSB

Unit 1 reactor power is 6% Rated Thermal Power with all four RCPs running. The following Loop 2 and 3 RCP indications are noted by the Control Room Staff.

Loop 2 RCP: Motor Bearing Temperature = 195 °F
Motor Stator Winding Temperature = 312 °F
Seal Water Inlet Temperature = 224 °F
RCP Shaft Vibration = 14 mils
RCP Frame Vibration = 3 mils

Loop 3 RCP: Motor Bearing Temperature = 175 °F
Motor Stator Winding Temperature = 310 °F
Seal Water Inlet Temperature = 226 °F
RCP Shaft Vibration = 16 mils
RCP Frame Vibration = 4 mils

Based on the above indications, assuming the required operator actions are taken, which ONE of the following describes the response of the affected loop Tave and the reason for the affect on Tave?

- A✓ Loop 2 Tave will initially decrease due to securing Loop 2 RCP.
- B. Loop 2 Tave will initially increase due to securing Loop 2 RCP.
- C. Loop 3 Tave will initially decrease due to securing Loop 3 RCP.
- D. Loop 3 Tave will initially increase due to securing Loop 3 RCP.

K/A

003 Reactor Coolant Pump

K5.03 Knowledge of the operational implications of the following concepts as they apply to the RCPS: Effects of RCP shutdown on Tave, including the reason for the unreliability of Tave in the shutdown loop.

K/A MATCH ANALYSIS

The K/A is matched for the following reasons:

- Knowledge of operational implications of an RCP being tripped is matched by testing the directional trend in Tave when the RCP is initially tripped. The operational implication of tripping an RCP is that Tave initially trends down.
- The reason for the unreliability of Tave is matched because Loop 2 Tave becomes unrepresentative due to the Loop 2 RCP being tripped. Therefore, the Loop 2 Tave indication is unreliable due to the Loop 2 RCP being tripped.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct because Loop 2 Tave is required to be tripped (Ref. 2) due to high motor stator winding temperature ($> 311^{\circ}\text{F}$) and Tave will initially decrease due to reverse flow, which occurs when the Loop 2 RCP is tripped.
- B. Incorrect because Loop 2 Tave will not increase due to a reduction in hot leg temperature due to the reverse flow, which occurs when Loop 2 RCP is tripped. Plausible because a misconception could exist where the applicant may believe that the coolant may have a longer transit time through the core in the forward direction, which would cause T_{hot} to increase, thus increasing Tave.
- C. Incorrect because Loop 3 RCP is not required to be tripped. Plausible because motor stator winding temperature is close to the value that requires the RCP to be tripped. Also, RCP Shaft vibration is at a level that creates an alarm in the control room, but below the value that requires the pump to be tripped (20 mils).
- D. Incorrect because Loop 3 RCP is not required to be tripped. Plausible because motor stator winding temperature is close to the value that requires the RCP to be tripped. Also, RCP Shaft vibration is at a level that creates an alarm in the control room, but below the value that requires the pump to be tripped (20 mils).

REFERENCES

1. V-LO-TX-16001 Reactor Coolant System.doc, Chpt. 16, Sect. B, Pg. 39, Rev. 3.
2. System Operating Procedure 13003-1, Rev. 31, 02/17/2004, Step 2.2.10
3. Vogtle Initial Exam VG02301, Question 003A2.02.

4. 004A2.07 001/2/1/LETDOWN ISOLATION/C/A 3.4/N/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Reactor is at 100% Rated Thermal Power
- PRZR LVL CNTL SELECT Switch is selected to CH 459 / 460
- PRZR LVL REC SEL Switch is selected to L-459
- LI-459 (Pressurizer Level Indicator) fails low
- Operators enter 18001-C, Primary Systems Instrumentation Malfunctions

Which ONE of the following correctly states the plant's expected response and correct operator actions?

- A. LV-459 (Letdown Isolation Valve) fully closes then HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening HV-8149B, then opening LV-459 and LV-460.
- B. HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close then LV-459 (Letdown Isolation Valve) fully closes. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening HV-8149B, then opening LV-459 and LV-460.
- C. LV-459 (Letdown Isolation Valve) fully closes then HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening LV-459 and LV-460, then opening HV-8149B.
- D. HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close then LV-459 (Letdown Isolation Valve) fully closes. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening LV-459 and LV-460, then opening HV-8149B.

K/A

004 Chemical and Volume Control

A2.07 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Isolation of letdown / makeup.

K/A MATCH ANALYSIS

The pressurizer level channel failure causes a letdown isolation valve to close. The impact of the letdown isolation valve closing is that the orifice isolation valves also close. Procedures then provide steps to restore letdown in a specific sequence caused by the automatic isolation of letdown. Therefore, the question addresses the impacts of letdown isolation as well as the procedural steps to mitigate the consequences. Even though the actions to restore are provided in procedure steps, only system

knowledge is needed to answer the question, thus no references should be provided.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. As stated below the orifice isolation valves will close prior to the letdown isolation valves. Also incorrect because upon restoration of letdown, LV-459 & 460 must be opened prior to HV-8149B being opened due to an interlock. Plausible because applicant may not be aware of the actuator design that allows for the quicker air bleed.
- B. Incorrect. Upon restoration of letdown, LV-459 & 460 must be opened prior to HV-8149B being opened due to an interlock. Plausible because applicant may not be aware of the interlock which will dictate the restoration sequence.
- C. Incorrect. As stated below the orifice isolation valves will close prior to the letdown isolation valves. Plausible because applicant may not be aware of the actuator design that allows for the quicker air bleed.
- D. Correct. CVCS System Description, Page 9, states that in the case of an automatic isolation, the actuators of the orifice isolation valves are designed to bleed air quicker so that they close before the letdown isolation valves (to avoid flashing). An auto close signal originates from the failed level transmitter (CVCS System Description, Page 8).

UTILITY NEEDS TO VERIFY THAT ORIFICE ISOLATION VALVES GET A CLOSED SIGNAL. OTHERWISE, "C" WOULD BE THE CORRECT ANSWER.

REFERENCES

- 1. Abnormal Operating Procedure 18001-C, Primary Systems Instrumentation Malfunctions, Rev. 23.2, 11/03/2003.
- 2. Abnormal Operating Procedure 18007-C, Chemical and Volume Control Malfunction, Rev. 17, 02/25/2004.
- 3. System Operating Procedure 13006-1, Chemical and Volume Control System, Rev. 62, 07/14/2004, Section 4.1.1.18.
- 4. Lesson Plan V-LO-TX-09101, Chemical and Volume Control System Lesson Plan, Rev. 3

5. 004K6.13 001/2/1/VCT MAKE-UP BORATE/C/A 3.1/N/VG05301/R/MAB/RSB

Unit 1 was at 100% Rated Thermal Power (RTP) for two weeks following a refueling outage when the following sequence of events occurred:

<u>Time</u>	<u>Actions / Condition</u>
13:00:00	Plant at 100% RTP
13:05:00	Plant at 85% RTP (Ramp down due to feedwater problems)
14:00:00	- VCT level = 30% - VCT auto make-up begins - The air line supplying 1FV-0110A (Boric Acid to Blender Valve) completely severs
14:01:00	Current time.

Assuming no operator action, which ONE of the following correctly states control room indications that the operator will receive?

- A. BORIC ACID FLOW DEVIATION Annunciator will NOT alarm. RCS temperature will rise.
- B. BORIC ACID FLOW DEVIATION Annunciator will alarm. RCS temperature will rise.
- C. BORIC ACID FLOW DEVIATION Annunciator will NOT alarm. RCS temperature will lower.
- D✓ BORIC ACID FLOW DEVIATION Annunciator will alarm. RCS temperature will lower.

K/A

004 Chemical and Volume Control

K6.13 Knowledge of the effect of a loss or malfunction on the following CVCS components: Purpose and function of the boration / dilution batch controller.

K/A MATCH ANALYSIS

Knowledge of the effect of a malfunction of the boration part of the VCT auto make-up is being tested. The effect is that the failure will halt both water and boron flow to the VCT, which has a subsequent effect on RCS average temperature. Also, the annunciators alarming as a result of the failure would be an effect of the malfunction. The K/A also states purpose and function of the batch controller. The purpose and function are elementary knowledge that must be understood in order to comprehend the question; therefore, they are being tested, although not explicitly.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. As stated below both alarms will annunciate. Plausible because the applicant may not be aware of the auto close feature of FV-0111B.
- B. Incorrect. Xe is building in due to the power reduction (less of a removal term due to lower neutron flux). FV-0110A fails open on loss of air. When FV-0110A fails open, FT-0110 senses a flow mismatch which causes BA FLOW DEVIATION to alarm and FV-0110B and FV-0111B to close. This stops all VCT makeup flow from both boron and water sources. When FV-0111B closes, TOTAL MAKEUP FLOW DEVIATION also alarms. With Xe concentration rising, the RCS temp will lower.
- C. Incorrect. TOTAL MAKEUP FLOW DEVIATION will alarm. Plausible because RCS temp will lower.
- D. Correct. RCS temperature will lower due to Xe buildup and potentially from some BA injection (20 second time delay?).

REFERENCES

- 1. VEGP 18007-C, Rev. 17, Page 12 of 13: Step 3 provides info to support that FV-110A will open upon loss of air.
- 2. VEGP 18007-C, Rev. 17, Page 9 of 13: SYMPTOMS provide annunciator choices for distractors and answer.
- 3. TOTAL MAKEUP FLOW DEVIATION, 17007-1, Rev. 21, Page 18 of 38, Window C02.
- 4. BA FLOW DEVIATION, 17007-1, Rev. 21, Page 33 of 38, Window F01.
- 5. LO-LP-60307-08, Rev. 08, 02/28/2002, Page 10: Provides Annunciator setpoints.
- 6. V-LO-TX-09101, Chemical and Volume Control System: Lesson Plan provides information on the VCT Makeup System.

6. 005A1.01 001/2/1/COOLDOWN RHR/C/A 3.5/N/VG05301/R/MAB/RSB

Unit 1 has just completed a cooldown via the RHR system. The following data was collected:

Today is May 27.

<u>Time (hrs)</u>	<u>RCS Temperature (°F)</u>	<u>RCS Pressure (psig)</u>
0100	300	350
0115	275	350
0130	250	350
0145	228	350
0200	200	350
0215	182	350
0230	147	350
0245	130	350
0300	100	350

Which ONE of the following correctly states the actions required by Technical Specifications? (Reference provided)

- A. No Technical Specification REQUIRED ACTION covers the plant conditions. Enter LCO 3.0.3.
- B. Perform Technical Specification required actions to restore parameters to within limits within 30 minutes. The RCS must be determined to be acceptable for continued operation by May 30 at 0230 hours.
- C. Perform Technical Specification required actions to restore parameters to within limits within 30 minutes. The RCS must be determined to be acceptable for continued operation by May 30 at 0300 hours.
- D✓ Perform Technical Specification required actions to immediately begin restoring parameters to within limits AND determine the RCS is acceptable for continued operation prior to entering Mode 4.

K/A

005 Residual Heat Removal

A1.07 Ability to predict and / or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RHRS controls including: Heatup/cooldown rates.

K/A MATCH ANALYSIS

The cooldown is being accomplished via RHRS controls. The question tests the applicants ability to calculate the cooldown rate which is a skill needed to monitor the cooldown rate and prevent exceeding the cooldown rate limit. The cooldown rate is a design limit with brittle failure as its basis. In this question, the design limit is not violated; however, the knowledge of the design limit is tested by calculating the rate, comparing it to Tech Specs, and making the determination that design limits were not violated. LCO 3.4.3 action statement is a less than 1 hour TS, thus it is required closed book knowledge.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Plausible because applicant may note that the LCO is applicable "at all times", but then realize that there is no LCO Condition and Required Action that covers Mode 5. LCO 3.0.3 is not a required action for this condition, but the applicant could potentially make that assumption given the wording of Tech Specs.
- B. Incorrect. The LCO action is only for Modes 1 -4. Plausible because this would be correct if applicant thought the cooldown rate was violated at 0230 hrs when it had changed by 103 F over the previous hour.
- C. Incorrect. The LCO action is only for Modes 1 -4. Plausible because this would be correct if the plant was still in Mode 4 due to the P being too high for 100 F.
- D. Correct. Action C applies during Mode 5, which is where the plant is when the C/D rate is violated.

REFERENCES TO BE PROVIDED: Tech Spec Section 3.4.3, Tech Spec Basis Section 3.4.3, PTLR Figure 2.1-2, PTLR Table 2.1-2, PTLR Section 2.0.

REFERENCES

1. Tech Spec 3.4.3, RCS Pressure and Temperature (P/T) Limits
2. Tech Spec Basis 3.4.3
3. Pressure Temperature Limits Report

7. 006A2.11 001/2/1/HPSI CORE COOLING/C/A 4.0/B/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Operators have initiated 19221-C, FR-C.1, "Response to Inadequate Core Cooling"
- The 'A' Safety Injection Pump (Intermediate Head Safety Injection) is not available
- The 'B' Safety Injection Pump (Intermediate Head Safety Injection) flow rate is 800 gpm.
- RVLIS Full Range Level is 28% and slowly lowering
- Core Exit Thermocouples are 720°F and slowly rising
- RCS pressure is 1800 psig
- NR Steam Generator levels are 35% and slowly rising
- Reactor Coolant Pumps have been secured

Which ONE of the following would be the next major action to mitigating the core cooling challenge?

- A✓ Depressurize all intact steam generators using steam dumps or ARVs to depressurize RCS down to the SI accumulator and SI injection pressures.
- B. Depressurize the RCS down to the SI accumulator and SI injection pressures by opening available pressurizer PORVs.
- C. Restart one RCP in a loop with an intact steam generator to provide forced two-phase flow for initiating RCS depressurization.
- D. Allow Intermediate Head Safety Injection to continue adding inventory, which will cool the RCS.

K/A

006 Emergency Core Cooling

A2.11 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Rupture of ECCS header.

K/A MATCH ANALYSIS

SI Pump flow indicating high when RCS pressure is above their shutoff head provides positive indication of an ECCS rupture. The procedural strategy to mitigate the above conditions is to depress the RCS via the SGs. Therefore, at a minimum, part (b) of the K/A is met by testing the procedural strategy of mitigating the ECCS break.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. 19221-C, Step 11, Page 10, provides direction to depress all intact SGs to 200 psig using either dumps (preferred) or ARVs. Parameters for the stem were chosen to reflect a Red Path leading to Inadequate Core Cooling. Safety Injection Pump flow and amps are indicative of runout conditions, yet the RCS pressure is above where injection would occur. SG parameters were chosen to allow for dump and/or ARV use.
- B. Incorrect. Use of PORVs would result in more RCS inventory loss and is therefore a less desirable option. (LO-LP-37061-10, Page 5) Opening PORVs and starting RCPs would only be attempted if depressing SGs was unsuccessful. Plausible because this is actually an option if depressing SGs is ineffective.
- C. Incorrect. See B above.
- D. Incorrect. As stated above, indications of an ECCS rupture are present, which preclude injection via Intermediate Head SI. Plausible because flow is indicated.

NOTE: This is considered an RO question because it does not test procedural transition or detailed knowledge of procedural steps. The question may be successfully answered by only knowing strategic knowledge of what to do in an inadequate core cooling situation.

REFERENCES

1. VG01301 Exam, Question 074EK1.03: Question modified for this exam.
2. 19221-C, FR-C.1 Response to Inadequate Core Cooling, Rev. 17.1, 08/27/2003.
3. ECCS Lesson Plan, Chapter 13, Rev. 2.0.
4. Lesson Plan LO-LP-37061-10, Rev. 10, 01/21/2002.
5. 19200-C, F-0 Critical Safety Function Status Trees, Rev. 19, 02/25/2004.

8. 007A3.01 001/2/1/PRT PRESSURIZER/C/A 2.7/M/VG05301/R/MAB/RSB

Unit 1 conditions are as follows:

- PRZR PRESS CNTL SELECT Switch is selected to 457 / 456
- Reactor is at 100% Rated Thermal Power
- PT-456 (Pressurizer Pressure Transmitter) has failed off scale high
- No operator actions have been taken
- At a later time Pressurizer Relief Tank (PRT) Parameters indicate:
 - Pressure = 1 psig
 - Temperature = 216 °F
 - Level = 90%

Which ONE of the following correctly states the current status of the Reactor and the PRT?

- A. Reactor trips on low pressurizer pressure. PRT rupture disks have blown.
- B✓ Reactor does not trip. PRT rupture disks have blown.
- C. Reactor trips on low pressurizer pressure. PRT rupture disks have not blown.
- D. Reactor does not trip. PRT rupture disks have not blown.

K/A

007 Pressurizer Relief/Quench Tank

A3.01 Ability to monitor automatic operation of the PRTS, including: Components which discharge to the PRT.

K/A MATCH ANALYSIS

An automatic function of the PRT is to have rupture disks blow at 100 psig. This is being tested because the PRT parameters, namely 2 psig, are evidence that the PRT has had rupture disks blown. Components that discharge to the PRT are being tested because the high failure of the PT causes a PORV to lift and cycle around the setpoint.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Rx does not trip. Plausible because the applicant may think that the PORV will fail open and stay open, thus leading to a low pwr press rx trip.
- B. Correct. PRT temp and press are high and pressure is low, which is indicative of a disk rupture. Also the failure will cause the PV-456A to open until pwr press drops to 2185 psig at which time it closes due to the interlock. The PORV will then cycle around the interlock setpt of 2185 psig. Therefore, with no operator action, the PORV will eventually fill the PRT and cause the rupture disk to blow, but the interlock will prevent a reactor trip on low pwr pressure.
- C. Incorrect. Rx does not trip and parameters are indicative of disk being blown. Plausible because the applicant may think that the PORV will fail open and stay open and may not realize that the low PRT press in conjunction with high temp and level is indication of disk rupture.
- D. Incorrect. Parameters are indicative of disk being blown. Plausible because the applicant may not realize that the low PRT press in conjunction with high temp and level is indication of disk rupture.

REFERENCES

1. System Operating Procedure 13004-1, Pressurizer Relief Tank Operation, Rev. 9, 09/18/2003.
2. Lesson Plan V-LO-TX-16001, Primary Systems Lesson Plan, Chapter 16, Rev. 3, Page 99.

NOTES:

Question was classified as modified because of its similarity to the lesson plan question and the fact that there is likely a question in a bank for Vogtle or some other Westinghouse plant that has this PT failure.

9. 008A4.01 001/2/1/CCW PUMP ALARM START/MEM 3.0/B/VG05301/R/MAB/RSB

The following conditions exist on Unit 1:

- Reactor is at 30% Rated Thermal Power
- NSCW Pumps 1 and 3 are running
- CCW Pumps 3 and 5 are running
- ACCW Pump 1 is running

CCW Pump 3 trips.

Which ONE of the following annunciators will provide adequate indication of the reason for the pump trip?

- A. ☒ CCW TRAIN A SURGE TANK LO-LO LEVEL
- B. CCW TRAIN A LO FLOW
- C. CCW TRAIN A SURGE TK MAKE UP LVL
- D. CCW TRAIN A LO HDR PRESS

K/A

008 Component Cooling Water

A4.01 Ability to manually operate and / or monitor in the control room: CCW indications and controls.

K/A MATCH ANALYSIS

Annunciators are being tested as an indication of the reason the CCW pump tripped. The K/A is met by testing knowledge needed to adequately monitor indications that cause the CCW pump to trip.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. LO-LO LEVEL will trip CCW pumps. See 17002-1 Window A05.
- B. Incorrect. See 17002-1 Window B06. Plausible because applicant may assume a minimum flow requirement for pump protection.
- C. Incorrect. See 17002-1 Window C05. Plausible because applicant may assume loss of suction would be a concern, hence auto pump trip.
- D. Incorrect. See 17002-1 Window A06. Plausible because there is an auto action (pump start) associated with the alarm.

REFERENCES

1. Alarm Response Procedure, 17002-1, ALB 02 on Panel 1A1.
2. Vogtle Exam Question LO-LP-10101-06-03.

10. 008AK3.05 001/1/1/SI ECCS TERMINATION/C/A 4.0/M/VG05301/R/MAB/RSB

The following conditions exist on Unit 2:

- A reactor trip and safety injection have occurred.
- No reactor coolant pumps are running.
- RCS pressure is 1335 psig and lowering.
- Pressurizer level is 100% and stable.
- RCS hot leg temperatures indicate 578 °F.
- Average of the five highest CETs on the IPC indicate 585 °F.
- Containment pressure is 4.5 psig.
- All steam generator narrow range levels indicate 8%.
- 200 gpm auxiliary feedwater flow is being supplied to each steam generator.

Which ONE of the following describes the correct course of action with respect to Safety Injection and the reason for that course of action?

- A✓ Do not terminate safety injection because of inadequate subcooling and inadequate RCS inventory.
- B. Do not terminate safety injection because of inadequate RCS inventory and inadequate secondary heat removal capability.
- C. Do not terminate safety injection because of inadequate subcooling and inadequate secondary heat removal capability.
- D. Safety injection may be terminated because all termination criteria are met.

K/A

008 Pressurizer Vapor Space Accident

AK3.05 Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: ECCS termination or throttling criteria.

K/A MATCH ANALYSIS

The question tests the reason for not terminating SI, which is the same as the reason for having the termination criteria in the first place. Conditions of a steam space LOCA are given to complete the K/A match.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Subcooling is zero (Core is saturated) and RCS P supports inventory being inadequate.
- B. Incorrect. Secondary heat removal is adequate. Plausible because SG levels are low, but AFW flows are adequate.
- C. Incorrect. Secondary heat removal is adequate. Plausible because SG levels are low, but AFW flows are adequate.
- D. Incorrect. Subcooling and RCS pressure are not met.

REFERENCES

- 1. ASME Steam Tables: <http://www.connel.com/freeware/steam.shtml>.
- 2. LO-LP-37022-16, SI Termination, Rev. 16, 08/29/2000.
- 3. Vogtle Exam Bank Question LO-LP-37022-04-02.
- 4. 19010-C, E-1 Loss of Reactor or Secondary Coolant, Rev. 28.2, 09/27/2002.
- 5. 19200-C, F-0 Critical Safety Function Status Trees, Rev. 19, 02/25/2004.

11. 009EA1.15 001/1/1/PORV BLOCK VALVE/C/A 3.9/B/VG05301/R/MAB/RSB

Unit 1 is operating at 100% rated thermal power with pressurizer level at 60% and both pressurizer spray valves in manual and shut while I&C investigates erratic responses.

A main turbine control failure results in a rapid load reduction. The RO stabilizes RCS pressure at 2300 psig by manually cracking open one spray valve. Pressure is held constant at 2300 psig for several minutes. The RO then observes that pressurizer level is 68%, PORV 455 is open, PORV 456 is shut, and the backup heaters are on.

Which ONE of the following correctly describes the status of the pressurizer pressure control system and required operator actions?

- A. The pressurizer pressure control system is functioning properly. Continue to lower pressure with pressurizer sprays.
- B✓ The pressurizer pressure control system is malfunctioning. Shut PORV Block Valve HV8000A.
- C. The pressurizer pressure control system is malfunctioning. Open PORV 456.
- D. The pressurizer pressure control system is malfunctioning. De-energize the backup heaters.

Have utility verify that there is no controller windup. If this were the case, could "A" also be correct?

K/A

009 Small Break LOCA

EA1.15 Ability to operate and monitor the following as they apply to a small break LOCA: PORV and PORV Block Valve.

K/A MATCH ANALYSIS

A breach in the RCS has occurred due to the PORV malfunctioning and being in the open position when it should be in the close position. The question tests the applicant's knowledge of the expected position of the valve given the plant conditions that are provided in the stem. The question also tests the required operator action based on the monitoring of the PORVs. The question tests the knowledge that the applicant must have in order to have the skills of monitoring and operating the PORV and PORV Block Valves.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Pzr pressure is below both PORV setpts and both PORVs should be closed, therefore the system is malfunctioning. Plausible because applicant may not know PORV setpoints.
- B. Correct. PORV 455 setpt is 2345 psig, therefore it should be closed.
- C. Incorrect. PORV 456 setpt is 2335 psig, therefore it should be closed. Plausible because applicant may not know the PORV setpts and opening the other PORV would be a correct response if the applicant were to think that the PORV setpt was violated.
- D. Incorrect. De-energizing backup heaters is an incorrect action. The B/U Htrs are energized because of high level in the pressurizer (insurge). Plausible because pressure is higher than nominal and de-energizing backup heaters would appear to help to reduce pressure.

REFERENCES

- 1. Vogtle Exam Bank Question LO-LP-16303-03-19.
- 2. Lesson Plan V-LO-TX-16001, Reactor Coolant System, Rev. 3.

12. 010K1.06 001/2/1/PRESSURIZER PRESSURE/C/A 2.9/M/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Reactor is at 85% Rated Thermal Power
- PRZR PRESS CNTL SELECT Switch is selected to CH 455 / 456
- Pressurizer Auxiliary Spray Valve (HV-8145) has started leaking
- ALB12, Window D03, PRZR PRESS LO PORV BLOCK, annunciates

Which ONE of the following correctly describes the affect on charging flow and the pressurizer pressure control system?

- A. Charging flow rate initially increases. The demand on the Pressurizer Pressure Master Controller increases.
- B. Charging flow rate initially decreases. The demand on the Pressurizer Pressure Master Controller increases.
- C✓ Charging flow rate initially increases. The demand on the Pressurizer Pressure Master Controller decreases.
- D. Charging flow rate initially decreases. The demand on the Pressurizer Pressure Master Controller decreases.

K/A

010 Pressurizer Pressure Control

K1.06 Knowledge of the physical connections and / or cause-effect relationships between the PRZ PCS and the following systems: CVCS.

K/A MATCH ANALYSIS

The aux spray is part of the pzs pcs. This question tests the applicants knowledge of how a malfunction in the pzs pcs will impact the CVCS, namely charging flow rate. Therefore, the cause-effect relationship knowledge is required to correctly answer the question.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Demand on the controller will decrease. Plausible because applicant may not have an indepth understanding of how the master controller will respond.
- B. Incorrect. Charging flow will increase. Plausible because applicant may not have an indepth understanding of how the master controller will respond and applicant may have a misconception of how charging flow will initially react to the leaking aux spray valve.
- C. Correct. There will be an initial pressure drop causing charging flow to intially go up. As pressure drops, the pcs will want more heaters to turn on, thus the demand on the master controller must lower.
- D. Incorrect. Charging flow will increase. Plausible because applicant may have a misconception of how charging flow will initially react to the leaking aux spray valve.

REFERENCES

- 1. Surry 2004-301, 004A2.17: Original question that was modified for this exam.
- 2. Lesson Plan V-LO-TX-16001, Primary Systems Lesson Plan, Chapter 16, Rev. 3, Page 99.
- 3. 1C1, Window D03, PRZR PRESS LO PORV BLOCK, 08/01/2003, Page 23 of 40.

13. 011EA2.07 001/1/1/RHR PUMP SEAL COOL/C/A 3.2/N/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- A Large Break LOCA and Loss of Offsite Power has occurred.
- The 'A' Diesel Generator failed to start.
- The crew has completed Cold Leg Recirc per 19013-C, Transfer to Cold Leg Recirculation, with the 'B' RHR Pump in operation.
- RCS temperature is 145 °F and stable.
- The CCW supply to the 'B' RHR Pump seal package has ruptured.

Which ONE of the following correctly states the actions required to mitigate the above conditions?

- A. The 'B' RHR pump must be secured to avoid seal damage. Use a steam generator to remove RCS heat.
- B. The 'B' RHR pump must be secured to avoid seal damage. Use safety injection pumps to remove RCS heat.
- C. The 'B' RHR pump must be secured to avoid seal damage. Use charging pumps to remove RCS heat.
- ☒ D. Continue to operate the 'B' RHR pump to remove RCS heat.

K/A

011 Large Break LOCA

EA2.07 Ability to determine or interpret the following as they apply to a Large Break LOCA: That equipment necessary for functioning or critical pump water seals is operable.

K/A MATCH ANALYSIS

The question tests knowledge of whether CCW is needed to support operation of the RHR pumps following a post-LOCA cooldown. CCW is relied upon to cool the seal packages (seal provides boundary for RCS water) of the RHR pumps when RCS temp is above a certain value.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. The RHR pump can continue to run with RCS temp < 150 F. Plausible because an applicant may think that the seal could be damaged with no CCW flow.
- B. Incorrect. The RHR pump can continue to run with RCS temp < 150 F. Plausible because an applicant may think that the seal could be damaged with no CCW flow.
- C. Incorrect. The RHR pump can continue to run with RCS temp < 150 F. Plausible because an applicant may think that the seal could be damaged with no CCW flow.
- D. Correct. The RHR pump can continue to run with RCS temp < 150 F.

The word "must" is used in the distractors to try to make it clear that the pump, if allowed to run, will have seal damage.

REFERENCES

- 1. V-LO-TX-12101, Residual Heat Removal System, Rev. 1.0.
- 2. 19013-C, ES-1.3 Transfer to Cold Leg Recirc, Rev. 24, 04/08/2004.

14. 012K1.07 001/2/1/STEAM DUMP RPS PORV/C/A 3.2/M/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Initial Reactor power was 51% Rated Thermal Power
- An Anticipated Transient Without Trip (ATWT) occurred (Turbine Trip without Reactor Trip)
- Tavg-Tref deviation is 20°F
- Crew has not yet manipulated any Steam Dump controls.
- The Balance of Plant operator reports that Steam Dump Banks 1, 2, 3 and 4 are fully open.

Which ONE of the following correctly describes the responses of the Steam Dump System with the current plant conditions?

- A✓ The steam dump system is operating properly.
- B. Banks 1, 2, and 3 should be full open. Bank 4 should be closed.
- C. Banks 1 and 2 should be full open. Bank 3 should be in a throttled position. Bank 4 should be closed.
- D. All 4 banks should be closed.

K/A

012 Reactor Protection

K1.07 Knowledge of the physical connections and / or cause effect relationships between the RPS and the following systems: SDS.

K/A MATCH ANALYSIS

The RPS interfaces with the steam dumps via the position of the rx trip bkrs and rx trip bypass bkrs. The ATWS provides information on the rx trip bkr position that will dictate which controller the SDS utilizes.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Rx Trip Bkrs and Bypass Bkrs are still closed. This causes the Load Rejection Controller to be utilized as opposed to the Rx Trip Controller. At 20°F temp deviation all 4 banks of dumps will be fully open. Therefore, the SDS is operating properly.
- B. Incorrect. See explanation in correct answer. Plausible because Bank 4 would not be open if on Plant Trip Controller.
- C. Incorrect. See explanation in correct answer. Plausible because Bank 4 would not be fully open and Bank 3 would likely be throttled if Plant Trip Controller were being utilized.
- D. Incorrect. See explanation in correct answer. Plausible because applicant may overlook the fact that there is an arming signal, C-7, associated with the load rejection.

REFERENCES

- 1. Lesson Plan V-LO-TX-21201, Steam Dumps, Rev. 1.
- 2. Lesson Plan V-LO-TX-28101, RPS-SSPS--AMSAC, Rev. 3.
- 3. Lesson Plan V-LO-TX-21101, Main Steam, Rev. 4.
- 4. VCSummer Exam Question 029EK2.06, SM04301.

15. 012K2.01 001/2/1/RTB REACTOR TRIP BRE/MEM 3.3/N/VG05301/R/MAB/RSB

Which ONE of the following correctly describes the power supply associated with the Unit 1 NSSS Protection Cabinet 2?

- A. Its normal power supply is 1NY2N and its alternate power supply is 1NYRS.
- B. Its normal power supply is 1NYRS and its alternate power supply is 1NY2N.
- C✓ Its normal power supply is 1BY1B, which supplies two 26v DC power supplies, that typically operate in a load sharing configuration for reliability purposes.
- D. Its normal power supply is 1BY1B, which supplies two 26v DC power supplies, each of which must be operating in order to supply 100% of the electrical demand from the cabinet.

K/A

012 Reactor Protection

K2.01 Knowledge of bus power supplies to the following: RPS channels, components, and interconnections.

K/A MATCH ANALYSIS

Question tests knowledge of power to the RPS. This question was designated as New because I had no prior knowledge of the question existing, but there is a high likelihood that a similar question does actually exist. This question could be designated as bank or modified without impacting the minimum number of new and modified question requirement.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. See referenced lesson plan Pages 6 and 7. Plausible because this is correct for the NSSS Control Cabinet 2.
- B. Incorrect. See referenced lesson plan Pages 6 and 7. Plausible because the choices from the above distractor are reversed for the normal and alternate power supplies to the NSSS Control Cabinet 2.
- C. Correct. See referenced lesson plan Pages 6 and 7.
- D. Incorrect. See referenced lesson plan Pages 6 and 7. The reasoning is incorrect in that each 26v DC power supply is capable of carrying 100% of the demanded load. Plausible because most of the time both are in service in a load sharing configuration.

REFERENCES

1. LO-LP-60324-05-C, Loss of 120V AC Instrument Power, Rev. 8, 03/25/2002.

16. 013A1.04 001/2/1/FEED AND BLEED/C/A 3.4/N/VG05301/R/MAB/RSB

The Unit 1 operating crew is performing 19231-C, FR-H.1 Response to Loss of Secondary Heat Sink, due to a loss of all feedwater.

The following conditions exist:

- All Hot leg RTDs are indicating 560 °F.
- All steam generator (SG) levels are indicating 7% WR.
- Maintenance is working on restoring auxiliary feedwater (AFW) capability and are estimating that it will be available in 15 minutes.

Which ONE of the following correctly states the mitigation strategy that is directed by 19231-C?

- A. Immediately establish feed and bleed to lower RCS temperature, then attempt to establish AFW at 30 to 100 gpm to one SG until a WR SG level of greater than 9% is reached.
- B. Immediately establish feed and bleed to lower RCS temperature, then attempt to establish AFW at 30 to 100 gpm to all SGs until WR SG levels of greater than 9% are reached.
- C. Continue monitoring SG levels until they reach 0% WR, then establish feed and bleed to lower RCS temperature and attempt to establish AFW at 30 to 100 gpm to one SG until a WR SG level of greater than 9% is reached.
- D. Continue monitoring SG levels until they reach 0% WR, then establish feed and bleed to lower RCS temperature and attempt to establish AFW at 30 to 100 gpm to all SGs until WR SG levels of greater than 9% are reached.

K/A

013 Engineered Safety Feature Actuation

A1.04 Ability to predict and / or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ESFAS controls including: S/G level.

K/A MATCH ANALYSIS

The question tests knowledge of operation of AFW controls during a loss of heat sink event given that SG levels are below a certain level. Without establishing cooling to the core, the fuel will exceed design limits and overheat.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. With NR Levels as low as they are, feed and bleed is required immediately (19231-C, Step 3) and one SG is to be fed at 30-100 gpm until its NR level is above 10% (19231-C, Note prior to Step 23).
- B. Incorrect. Feeding all SGs is not correct. Plausible because feeding all SGs would more quickly establish a heat sink.
- C. Incorrect. Feed and bleed is required immediately. Plausible because the applicant may think that there is still inventory in the SG due to 7% level.
- D. Incorrect. Feed and bleed is required immediately. Plausible because the applicant may think that there is still inventory in the SG due to 7% level.

REFERENCES

- 1. 19231-C, FR-H.1, Response to Loss of Secondary Heat Sink, Rev. 26.5, 04/14/2003.
- 2. 19200-C, F-0 Critical Safety Function Status Trees, Rev. 19, 02/25/2004.

17. 013K3.03 001/2/1/CONTAINMENT SPRAY/C/A 4.3/N/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- The unit is operating at 100% Rated Thermal Power.
- Bus 1AY1A is on its regulated transformer for maintenance activities to be performed.
- An earthquake occurs and causes the following simultaneous failures:
 - a double ended guillotine main steam line break in containment
 - containment pressure is 25 psig
 - a loss of offsite power
 - Bus 1BY1B is de-energized
- Both diesel generators start and load as designed.

Which ONE of the following correctly states the status of the containment spray system several minutes after the diesel generators finish their load sequence?

- A✓ Train "A" actuates, but Train "B" does not actuate.
- B. Train "B" actuates, but Train "A" does not actuate.
- C. Neither Train "A" or "B" actuate.
- D. Both Train "A" and "B" actuate.

HAVE UTILITY VERIFY THAT AFTER DIESEL SEQUENCE HAS FINISHED THAT THE CONTAINMENT PRESSURE COULD BE > 21.5 PSIG.

K/A

013 Engineered Safety Features Actuation

K3.03 Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Containment.

K/A MATCH ANALYSIS

The malfunction is the loss of 1BY1B and the effect on containment is that only one train of ESFAS equipment actuates.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. The EDG will repower 1AY1A from its backup source and actuate the "A" Train spray components.
- B. Incorrect. Relays are energize-to-actuate and Train "B" relays do not have power due to the fault. Plausible because most SSPS functions are de-energize to actuate.
- C. Incorrect. Plausible because power supplies from both trains have issues.
- D. Incorrect. Plausible because most SSPS functions are de-energize to actuate and power supplies from both trains are de-energized at one point or another during the above sequence.

REFERENCES

- 1. LO-LP-60324-05-C, Loss of 120VAC Inst Power, Rev. 8, 03/25/2002.
- 2. V-LO-TX-15101, Containment Spray, Rev. 6.

18. 014A1.03 001/2/2/PDIL SDM DRPI/C/A 3.6/N/VG05301/R/MAB/RSB

The RO withdraws control bank C rods to establish conditions for a dilution to criticality.

Prior to the rod withdrawal the following conditions existed:

DRPI: 42 Steps

Group 1 Step Counter: 42 Steps

Group 2 Step Counter: 41 Steps

After the rod withdrawal the following conditions exist:

DRPI: 42 Steps

Group 1 Step Counter: 56 Steps

Group 2 Step Counter: 55 Steps

Based on these indications, which ONE of the following correctly describes the state of the "Rod Dev" and "Rod Bank Lo-Lo-Limit" annunciators?

- A✓ The "Rod Dev" annunciator alarms and the "Rod Bank Lo-Lo-Limit" annunciator clears.
- B. The "Rod Dev" annunciator alarms and the "Rod Bank Lo-Lo-Limit" annunciator remains illuminated.
- C. The "Rod Dev" annunciator does not alarm and the "Rod Bank Lo-Lo-Limit" annunciator remains illuminated.
- D. The "Rod Dev" annunciator does not alarm and the "Rod Bank Lo-Lo-Limit" annunciator clears.

Replacement question provided by utility on 05/24/2005.

K/A

014 Rod Position Indication

A1.03 Ability to predict and / or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including: PDIL, PPDIL.

K/A MATCH ANALYSIS

A failure in DRPI, rod position indication, reduces the accuracy of that indication. Therefore, operators must then know, based on that failure, what the lowest indicated rod position, as read on DRPI, would allow for verification of compliance with PDIL requirements.

ANSWER / DISTRACTOR ANALYSIS

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

REFERENCES

1. Tech Specs referred to in answer choices.

19. 015/017G2.4.10 001/1/1/RCP ALARM ANNUNCIATO/C/ A 3.0/N/VG05301/R/MAB/RSB

Unit 1 Operators were in the process of swapping to Main Feedwater Regulating Valves in accordance with 12004-C, Power Operation (Mode 1), when the following alarms annunciated:

- ALB11-F06, UNDERFREQUENCY RCP BUS ALERT
- ALB11-E06, UNDERVOLTAGE RCP BUS ALERT

Subsequently Operators note that Bus 1NAA was de-energized.

Which ONE of the following correctly states the status of the RCPs?

- A. Only #1 and #2 RCPs trip.
- B. Only #1 and #3 RCPs trip.
- C. Only #2 and #4 RCPs trip.
- D✓ All RCPs trip.

K/A

015/017 RCP Malfunctions

G2.4.10 Knowledge of annunciator response procedures.

K/A MATCH ANALYSIS

The RCP malfunction is a loss of power. Guidance is contained in C1-F06 that states that all four RCPs will trip if P-7 is made up. Therefore, the question tests knowledge in the ARPs related to an RCP malfunction.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Plausible because applicant may confuse which RCPs are powered by 1NAA.
- B. Incorrect. Plausible because this would be correct if P-7 were not made up.
- C. Incorrect. Plausible because applicant may confuse which RCPs are powered by 1NAA.
- D. Correct. P-7 is made up because MFRV swap occurs between 16 and 20% RTP (P-7 logic is 2/4 NIs or 1/2 turb pwr > 10%). Therefore, according to 17011-1, 1C-F06, a trip of all RCPs will occur if Bus 1NAA is lost.

REFERENCES

- 1. 17011-1, Annunciator Response Procedures for ALB 11 on Panel 1C1 on MCB, Rev. 13, 08/01/03.
- 2. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3.0.
- 3. 12004-C, Power Operation (Mode 1), Rev. 64, 05/08/2004.

20. 017K3.01 001/2/2/CETC NATURAL CIRC/C/A 3.5/B/VG05301/R/MAB/RSB

Given the following Unit 2 conditions:

- A small break loss of coolant accident has occurred
- All reactor coolant pumps have been tripped
- Natural circulation is believed to be established

Core Exit Thermocouples (CETC) system readouts have failed.

- Pressurizer pressure channel PT-455 indicates 1725 psig
- Pressurizer pressure channel PT-457 indicates 1735 psig
- RCS pressure PT-408 and 418 indicate 1690 psig
- RCS pressure PT-428 and 438 indicate 1685 psig

RCS Hot and Cold Leg Wide Range Temperatures indicate as follows:

	Loop 1	Loop 2	Loop 3	Loop 4
Thot	540	550	560	555
Tcold	533	543	553	550

Which ONE of the following temperature values (in degrees F) will be the correct amount of subcooling when using RTDs?

- A✓ 53
- B. 56
- C. 57
- D. 60

K/A

017 In-core Temperature Monitor

K3.01 Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: Natural circulation indications.

K/A MATCH ANALYSIS

Question tests the knowledge of alternate indications of subcooling that are available if the CETCs are inoperable. NC has been established, therefore the WR instruments should provide an alternate indication.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Used Tsat for lowest pressure (1685 psig = 1700 psia corresponds to 613 F) and subtracted highest Thot ($613 - 560 = 53$ F).
- B. Incorrect. Used lowest Pzr P (1725 psig = 1740 psia corresponds to 616 F) and subtracted highest Thot ($616 - 560 = 56$ F)
- C. Incorrect. Used highest pressure (1735 psig + 15 psi = 1750 psia) for Tsat and subtracted highest Thot ($617 - 560 = 57$ F).
- D. Incorrect. Subtracted highest Tcold ($613 - 553 = 60$ F).

REFERENCES

- 1. Tech Spec Basis 3.3.3 Pages B 3.3.3-4 through B 3.3.3.-6)
- 2. Farley Exam FA01301, Question 017K3.01.

21. 022K2.01 001/2/1/CONTAINMENT COOLING/MEM 3.0/B/VG05301/R/MAB/RSB

All containment cooling fan controls are in their normal at power configuration.

Which ONE of the following correctly describes the response of the Train "A" containment fan coolers following a loss of offsite power with an "A" Train safety injection present?

(assume sequencer starts at 0 seconds)

- A. At 30.5 seconds 2 fans start in high speed and at 50.5 seconds 2 fans start in high speed.
- B. At 30.5 seconds 2 fans start in low speed and at 50.5 seconds 2 fans start in low speed.
- C. At 30.5 seconds 4 fans start in high speed.
- D. At 30.5 seconds 4 fans start in low speed.

K/A

022 Containment Cooling

K2.01 Knowledge of power supplies to the following: Containment cooling fans.

K/A MATCH ANALYSIS

The sequencer controls the bus loading when the EDGs are called upon. The sequencer is designed to prevent voltage drops and/or fluctuations due to loads on a particular safety bus. This question tests knowledge of the sequencer, hence it tests knowledge of the power supplies.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. All fans start at 30.5 sec. Plausible because this would be correct if no SI present.
- B. Incorrect. Plausible for same reason as "A" with exception of slow speed.
- C. Incorrect. Fans start in slow speed with an SI present. Plausible because all fans start at 30.5 sec.
- D. Correct. See Page 17 of referenced lesson plan.

REFERENCES

- 1. Vogtle test question LO-LP-29130-01-05.
- 2. Vogtle test question LO-LP-29130-02-01.
- 3. V-LO-TX-29101, Containment HVAC Systems.

22. 022K4.01 001/2/1/PENETRATION COOLING/MEM 2.5/B/VG05301/R/MAB/RSB

Which ONE of the following groups of components are ALL designed to be directly cooled by the Nuclear Service Cooling Water System?

- A. AFW pump motor cooler, CCW heat exchangers, EDG jacket water cooler, containment auxiliary cooler.
- B. Spent fuel cooling pump motor cooler, ACCW heat exchangers, seismic fire hose stations, CCW pump motor cooler.
- C✓ Control building ESF chillers, containment coolers, RHR pump motor cooler, piping area penetration cooler.
- D. Containment spray pump motor cooler, SI pump oil cooler and motor cooler, Charging pump oil and motor cooler, EDG lube oil heat exchanger.

K/A

022 Containment Cooling

K4.01 Knowledge of CCS design feature(s) and / or interlock(s) which provide for the following: Cooling of containment penetrations.

K/A MATCH ANALYSIS

One of the design features of the piping penetration is that it is cooled by the Nuclear Service Cooling Water system.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. AFW pump motor cooler is not cooled by NSCW. Plausible because the other loads are cooled by NSCW.
- B. Incorrect. Spent fuel pool cooling pump motor cooler is not cooled by NSCW. Plausible because the other loads are cooled by NSCW.
- C. Correct. See V-LO-TX-06101, Pages 9 and 10.
- D. Incorrect. EDG lube oil heat exchanger is not cooled by NSCW. Plausible because the other loads are cooled by NSCW.

23. 024AK2.01 001/1/2/EMERGENCY BORATION/MEM 2.7/M/VG05301/R/MAB/RSB

Which ONE of the following correctly describes an emergency boration flow path option through the regenerative heat exchanger in accordance with 13009-1, CVCS Reactor Makeup Control System?

- A. Emergency boration through 1-HV-8104, Emergency Borate Valve, by:
- starting a Boric Acid Transfer Pump
 - ensuring a Charging Pump is running
 - opening 1-HV-8104, and
 - placing 1-FIC-0121 in manual and adjusting flow to 30 gpm.
- B. Emergency boration through the normal charging path by:
- starting a Boric Acid Transfer Pump
 - ensuring a Charging Pump is running
 - opening 1-FV-0110A, BA to BA Blender
 - opening 1-FV-0110B, Blender Outlet to Charging Pump Suction
 - placing 1-FIC-0121 in manual and adjusting flow to 30 gpm.
- C. Emergency boration from the RWST by:
- ensuring one Charging Pump is running and supplied with cooling water
 - opening 1-LV-0112D and E, Charging Pump Suctions from the RWST
 - closing 1-LV-0112B and C, VCT Outlet Isolations
 - placing 1-LV-0112A to the HUT position
 - placing 1-FIC-0121 in manual and adjust charging flow to greater than 100 gpm
 - adjusting 1-HV-0182, Charging Seal Flow Control, to maintain RCP seal injection flow at approximately 40 gpm (8 - 13 gpm per pump).
- D. Emergency boration from the RWST by:
- ensuring one Charging Pump is running and supplied with cooling water
 - opening 1-LV-0112D and E, Charging Pump Suctions from the RWST
 - closing 1-LV-0112B and C, VCT Outlet Isolations
 - placing 1-LV-0112A to the HUT position
 - opening 1-HV-8801A and B, BIT discharge isolations
 - ensuring 1-FI-0917A, BIT flow, plus total seal injection flow, less total seal return flow is greater than 87.5 gpm.

K/A

024 Emergency Boration

AK2.01 Knowledge of the interrelations between the Emergency Boration and the following: Valves.

K/A MATCH ANALYSIS

Question tests knowledge of flow paths and valve position adjustments to get procedurally required flow rates to satisfy emergency boration requirements. Therefore, the interrelations between emergency boration and valves is being tested by the question.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Flow is too low. See 13009-1, Section 4.9.1.
- B. Incorrect. Flow is too low. See 13009-1, Section 4.9.2.
- C. Correct. See 13009-1, Section 4.9.3.
- D. Incorrect. Regen Heat Exchanger is in service. See 13009-1, Section 4.9.3.

REFERENCES

- 1. 13009-1, CVCS Reactor Makeup Control System, Rev. 31, 01/13/2004.
- 2. Vogtle Bank Question LO-LP-09401-04-11.
- 3. Vogtle Bank Question LO-LP-09401-04-14.
- 4. Vogtle Bank Question LO-LP-09401-04-03.

24. 025AK1.01 001/1/1/LOSS OF RHR MID-LOOP/C/A 3.9/M/VG05301/R/MAB/RSB

The following conditions exist on Unit 1:

- The plant is 37 days and 12 hours into a refueling outage.
- The unit is in Mode 5 at mid-loop conditions.
- RHR 1A heat exchanger inlet temperature is stable at 100 °F.
- Due to outage complications, core offload has not yet commenced.
- Subsequently the 1A RHR Pump trips.
- The crew enters 18019-C, Loss of Residual Heat Removal and are preparing to calculate the time to boil.

Which ONE of the following is correct if the loss of RHR continues without mitigation?
(References provided)

- A✓ The time to boiling is less than 50 minutes. Promptly initiate actions to protect personnel inside containment and establish containment closure.
- B. The time to boiling is more than 60 minutes. Promptly initiate actions to protect personnel inside containment and establish containment closure.
- C. The time to boiling is less than 50 minutes. Promptly align SI pumps for Hot Leg Injection and establish Charging flow needed to maintain RCS level.
- D. The time to boiling is more than 60 minutes. Promptly align SI pumps for Hot Leg Injection and establish Charging flow needed to maintain RCS level.

PROVIDE THE FOLLOWING REFERENCES:
18019-C, Figures 1 - 5.

K/A

025 Loss of RHR System

AK1.01 Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: Loss of RHRS during all modes of operation.

K/A MATCH ANALYSIS

An implication of loss of RHR at mid-loops is that there is a small amount of time until the core reaches saturation conditions. This question tests the ability of the applicant to use tools to calculate the time to boil and based on this time, determine required operator actions. Therefore, operational implications of loss of RHR are being tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Step B4 of 18019 gives direction to calculate heatup rate. If the time to boil is less than 1 hour, then do steps B6 and B7. Steps B6 and B7 contain actions to close containment and start fans in low speed. In this question the time to boil is less than one hour, per Figure 3 (900 hours at 100 F initial temp = < 45 minutes).
- B. Incorrect. Fans are to be started in slow speed, not fast. Plausible because applicant may not know correct mode of fan operation.
- C. Incorrect. If Figure 4 is incorrectly used, then time to boil is about 67 minutes, leaving 7 minutes until steps B6 and B7 need to be performed. Plausible due to possibility of using the wrong figure.
- D. Incorrect. Reasons of B and C above.

REFERENCES

- 1. 18019-C, Loss of Residual Heat Removal, Rev. 24, 09/17/2003.
- 2. Vogtle Exam Bank Question LO-LP-60315-03-02.

25. 026AK3.02 001/1/1/CCW SAFETY INJECTION/C/A 3.6/M/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Unit is in Mode 3.
- CCW Pumps 2 and 6 are running.
- CCW Pump 4 is in Pull-To-Lock.
- All other CCW Pumps are in their normal configuration.

A loss of offsite power occurs coincident with a Low Steam Line Safety Injection. Both emergency diesel generators start and energize their respective busses.

Which ONE of the following is the correct CCW system response and the reason for the response?

- A. Pumps 1, 2, and 3 start at 20.5 seconds and Pumps 5 and 6 start at 25.5 seconds due to the Pump 4 breaker not closing.
- B. Pumps 1, 2, and 3 start at 20.5 seconds and Pumps 5 and 6 start at 25.5 seconds due to Pump 4 low discharge pressure.
- C✓ Pumps 1, 2, and 3 start at 20.5 seconds and Pump 6 starts at 25.5 seconds due to the Pump 4 breaker not closing (Pump 5 does not start).
- D. Pumps 1, 2, and 3 start at 20.5 seconds and Pump 6 starts at 25.5 seconds due to Pump 4 low discharge pressure (Pump 5 does not start).

(ENSURE UTILITY VERIFIES THAT PUMP 6 STARTS DUE TO BREAKER POSITION OF PUMP 4 AND NOT LOW DISCHARGE PRESSURE. THE LESSON PLAN IMPLIES THIS, BUT DOES NOT EXPLICITLY STATE IT.)

K/A

026 Loss of Component Cooling Water

AK3.02 Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: The automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS.

K/A MATCH ANALYSIS

CCW is lost in its entirety when the LOOP and SIS occur. These conditions have an impact on which pumps auto start when the sequencer operates. The question tests what automatic actions occur to regain CCW and the reasons for those actions (i.e. What causes the start of pump 6?).

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Pump 5 does not start. Plausible because Pump 4 breaker actually does not close and an additional pump does actually start at 25.5 sec.
- B. Incorrect. Pump 5 does not start. Plausible because of same reasons as 'A' above.
- C. Correct. See Reference 4, Page 23 and the Referenced Vogtle Bank Questions.
- D. Incorrect. Pump 6 does not start due to Pump 4 low discharge pressure. Plausible because Pump 4 will not start and as a result will not develop discharge pressure.

REFERENCES

- 1. Vogtle Exam Bank Question LO-LP-10101-05-01.
- 2. Vogtle Exam Bank Question LO-LP-10101-10-03.
- 3. Vogtle Exam Bank Question LO-LP-10101-10-04.
- 4. V-LO-LP-10101, CCW System, Revision 1.0.

26. 026K4.09 001/2/1/RWST RECIRC RADIOACT/MEM 3.7/N/VG05301/R/MAB/RSB

Which ONE of the following design features prevents radioactivity from escaping containment when the RWST EMPTY LEVEL alarm annunciates?

- A✓ Check valve located on the RWST suction line to the containment spray pumps.
- B. Interlock on the containment emergency sump suction valve to the containment spray pump.
- C. Automatic closure of the containment spray pump minimum flow valves that discharge to the RWST.
- D. CCP swap to RWST on VCT low level is automatically blocked.

K/A

026 Containment Spray

K4.09 Knowledge of CSS design feature(s) and / or interlock(s) which provide for the following: Prevention of path for escape of radioactivity from containment to the outside (interlock on RWST isolation after swapover).

K/A MATCH ANALYSIS

The check valve is a design feature that prevents radioactivity from reaching the RWST when in recirc mode from the sump.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. P&ID 1X4DB131, Containment Spray System, Rev. 31, coordinate D-3, displays the check valve to support the correct answer.
- B. Incorrect. No interlock exists on the suction valves from the sump. Plausible because an interlock, such as RWST suctions closed, would make sense when trying to limit radioactivity release.
- C. Incorrect. The lines are isolated with locked closed valves. P&ID 1X4DB131, Containment Spray System, Rev. 31, coordinate B-4 / H-5, displays the LC valves. Plausible because these lines are a potential path back to the RWST.
- D. Incorrect. There are no automatic blocks - procedural actions are required (see V-LO-TX-13101 Page 24). Plausible because these actions are required, although they do not occur automatically.

REFERENCES

1. P&ID 1X4DB121, Safety Injection System, Rev. 35.
2. P&ID 1X4DB131, Containment Spray System, Rev. 31.
3. V-LO-TX-13101, Emergency Core Cooling System, Rev. 2.0.
4. V-LO-TX-15101, Containment Spray System, rev. 2.0.
5. 17006-1, Window E05, RWST EMPTY LEVEL, Rev. 28.

27. 027AK3.03 001/1/1/COOLDOWN LIMITS NC/MEM 3.7/B/VG05301/R/MAB/RSB

A Unit 2 RCS cooldown is in progress at 50 °F/hr in accordance with 19002-C, ES-0.2 Natural Circulation Cooldown.

Which ONE of the following describes the reason for maintaining temperature and pressure within the limits of Technical Specification LCO 3.4.3 (PTLR)?

- A. To prevent DNB limits from being exceeded.
- B. To maintain RCS pressure at an acceptable value to allow a restart of an RCP.
- C. To maintain the RCS at a temperature and pressure to prevent a safety injection.
- D. To maintain the RCS temperature and pressure within limits to prevent upper head voiding.

K/A

027 Pressurizer Pressure Control System Malfunction

AK3.03 Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: Actions contained in EOP for PZR PCS malfunction.

K/A MATCH ANALYSIS

The PCS malfunction is that forced circ is not available; therefore, the normal pzs sprays will not function. The question tests the reason for restrictions associated with performing a NC cooldown iaw ES-0.2.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Plausible because DNB is dependent on temp and press.
- B. Incorrect. Plausible because press is part of criteria for running RCPs.
- C. Incorrect. Plausible because SI can occur due to low press.
- D. Correct. See referenced lesson plan and first page of referenced procedure.

REFERENCES

1. 19002-C, ES-0.2 Natural Circulation Cooldown, Rev. 18.1, 02/06/2001.
2. LO-LP-37012-14-C, Natural Circulation Cooldown, Rev. 14, 09/22/1999.
3. VCSummer 2004-301 Exam RO Question 027AK3.03.

28. 032AK2.01 001/1/2/SOURCE RANGE POWER/C/A 2.7/B/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- The reactor is stable at the point-of-adding-heat.
- Reactor Physics testing is in progress.
- Power Range Channel N-44 is in trip with the reactivity recorder installed.
- A fault occurs that results in a loss of Bus 1AY1A.

Which ONE of the following describes the effect on the source range indications and the reason for the indications?

- A. Source Range Channels N-31 and N-32 will remain energized and their indications will remain stable.
- B. Source Range Channels N-31 and N-32 will remain energized and their indications will decrease.
- C. Source Range Channel N-31 will de-energize and N-32 indication will remain stable.
- D. Source Range Channel N-31 will de-energize and N-32 indication will decrease.

UTILITY NEEDS TO SUPPLY REFERENCES AND VERIFY TECHNICAL
ACCURACY.

K/A

032 Loss of Source Range

AK2.01 Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and the following: Power supplies, including power switch positions.

K/A MATCH ANALYSIS

Question tests knowledge of how losing a power supply will affect the SR indications.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. N-31 will de-energize. Plausible because applicant may not know the power supply.
- B. Incorrect. N-31 will de-energize. Plausible because applicant may not know the power supply.
- C. Incorrect. N-32 indication will lower because Rx trips because IR also loses power. Plausible because applicant may not understand that the reactor will also trip, thereby causing N-32 indication to lower.
- D. Correct. N-31 de-energizes and N-32 indication lowers because the IR also loses power, which trips the reactor.

REFERENCES

- 1. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3.
- 2. V-LO-TX-17201, Source and Intermediate Range, Rev. 1.
- 3. V-LO-TX-01101, Electrical Distribution, Rev. 2.
- 4. Surry Exam Question SR02301.

29. 034K4.03 001/2/2/FUEL HANDLING LOADS/C/A 2.6/N/VG05301/R/MAB/RSB

Operators are performing refueling operations for Unit 2. The following conditions exist:

- Operators have a fuel assembly attached to the mast of the refueling machine suspended about 4 feet from the bottom of the core.
- HOIST LOAD OVERLOAD LIGHT is illuminated red

Which ONE of the following correctly describes what physically must occur in order to get the refueling machine to continue to pull the assembly in the upward direction (Assume the Fuel Handling Supervisor has given you permission)?

- A. Place the HOIST JOYSTICK in the UP position. No other actions are required.
- B. Place the HOIST JOYSTICK in the UP position while pushing the HOIST LOAD BYPASS PUSHBUTTON.
- C. Select "MANUAL" operational mode followed by placing the HOIST JOYSTICK in the UP position.
- D. Select and hold "OVERRIDE" on the INTERLOCK OVERRIDE KEY SWITCH while placing the HOIST JOYSTICK in the UP position.

K/A

034 Fuel Handling Equipment

K4.03 Knowledge of design feature(s) and / or interlock(s) which provide for the following: Overload protection.

K/A MATCH ANALYSIS

Question requires knowledge of how to over-ride the overload protection.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. This will not work with an overload condition. Plausible because this will work without the overload condition.
- B. Incorrect. HOIST LOAD BYPASS PUSHBUTTON allows the assembly to be lowered with an underload, but not withdrawn with an overload. Plausible because the pushbutton does bypass an interlock, but not the overload interlock.
- C. Incorrect. "Manual" mode does not override the interlocks. Plausible because applicant could have a misconception that "Manual" mode will override interlocks.
- D. Correct. In the "Interlock Override" mode all interlocks are inactive.

REFERENCES

1. V-LO-TX-25101, Fuel Handling Systems and Refueling Operations.

30. 036AK1.02 001/1/2/SDM SHUTDOWN MARGIN/MEM 3.4/N/VG05301/R/MAB/RSB

Unit 1 refueling was in progress when a new fuel assembly was dropped in the reactor core and came to rest in close proximity to a previously irradiated fuel assembly. The control room staff noted a small increase in count rate and plotted the next point on the inverse count rate ratio (1/M) plot.

Which ONE of the following correctly describes the reactivity implications of the above conditions?

- A✓ The 1/M plot will trend in the downward direction. There is little risk of creating a critical configuration because the pre-event boron concentration must be such that K-eff is maintained less than 0.95.
- B. The 1/M plot will trend in the downward direction. Emergency boration would be required to prevent a loss of shutdown margin (SDM).
- C. The 1/M plot will trend in the upward direction. There is little risk of creating a critical configuration because the pre-event boron concentration must be such that K-eff is maintained less than 0.95.
- D. The 1/M plot will trend in the upward direction. Emergency boration would be required to prevent a loss of shutdown margin (SDM).

K/A

036 Fuel Handling Accident

AK1.02 Knowledge of the operational implications of the following concepts as they apply to the Fuel Handling Incidents: SDM.

K/A MATCH ANALYSIS

A fuel handling accident has occurred and an operational implication to that is an increase in count rate and a downward trend on the 1/M (ICRR) plot. Testing the knowledge of how the count rate affects the plot is testing an operational implication, related to SDM, of a fuel handling incident. Understanding the pre-event SDM conditions is pertinent to knowing how configuration changes can affect reactivity also.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Tech Spec 3.9.1; COLR 2.9; 12007-C, Step 2.2.3. The fuel increased count rate will cause the plot to trend downward because the configuration is closer to a critical configuration as compared to pre-event conditions when the baseline count rate would have been recorded.
- B. Incorrect. Refueling procedures and the fuel handling event AOP were all checked to ensure emergency boration was not required for a fuel handling event (utility's quote). Plausible because of the increase in CR.
- C. Incorrect. The plot will trend in the downward direction. Plausible because the count rate has gone up, which may lead an applicant to believe that the plot should also trend up.
- D. Incorrect. The plot will trend in the downward direction. Plausible because the count rate has gone up, which may lead an applicant to believe that the plot should also trend up.

REFERENCES

- 1. Technical Specification, LCO 3.9.1.
- 2. Core Operating Limits Report, Section 2.9.
- 3. 12007-C, Refueling Operations (Entry Into Mode 6), Rev. 57, 4/21/2004.

31. 037AK1.02 001/1/2/SGTL LEAK RATE/C/A 3.5/B/VG05301/R/MAB/RSB

Unit 2 is shutting down from 100% Rated Thermal Power in response to a steam generator tube leak per AOP 18009-C, Steam Generator Tube Leak.

Which ONE of the following correctly states the trend of the estimated leak rate during the shutdown and the reason for the trend? (Assume that the geometric size of the flaw remains constant)

- A✓ Estimated leak rate would decrease because the primary to secondary pressure difference is reduced as power is lowered.
- B. Estimated leak rate would decrease because the air ejector flow rate would decrease as power is lowered.
- C. Estimated leak rate would remain the same because the monitored isotopes analyzed are independent of power level.
- D. Estimated leak rate would increase because of the iodine spiking associated with the shutdown.

K/A

037 Steam Generator Tube Leak

AK1.02 Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: Leak rate vs. pressure drop.

K/A MATCH ANALYSIS

The question tests knowledge of operational implications of how the leak rate changes as the dP across the SG tubes decreases with a power reduction.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. As Gov Valves (or Control Valves) are closed, the pressure in the SGs will rise, thus reducing the dP across the tubes, thereby reducing the leak rate.
- B. Incorrect. If offgas flow rate goes down, then the leakage based on that would go up.
- C. Incorrect. Leakage decreases. Plausible there is not a noticeable change in isotopes and this distractor could be considered realistic if an applicant did not consider the dP changes.
- D. Incorrect. Plausible because iodine spiking does occur on a rapid shutdown such as a reactor trip.

REFERENCES

- 1. Point Beach 2002 RO Exam 037AK1.02.

32. 038EA2.17 001/1/1/SGTR RCP RESTART/MEM 3.8/N/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- A steam generator tube rupture has occurred and the control room crew has proceeded to the point in 19030-C, E-3 Steam Generator Tube Rupture, where they are evaluating conditions for restart of a reactor coolant pump.
- Containment pressure is 1 psig.
- Containment temperature is 100 °F.

Which ONE of the following correctly describes a set of conditions that would NOT prevent restart of a reactor coolant pump?

- A. RCP seal number 1 temperatures are 195 °F. Seal injection flow and ACCW cooling to the thermal barrier was lost for 15 minutes.
- B✓ RCP seal number 1 dP is 210 psi and pressurizer level is 95%.
- C. RCP seal number 1 temperatures are 225 °F. Seal injection flow and ACCW cooling to the thermal barrier was lost for 15 minutes.
- D. RCP seal number 1 dP is 220 psi and #1 seal leakoff flow is 5.8 gpm.

K/A

038 Steam Gen. Tube Rupture

EA2.17 Ability to determine or interpret the following as they apply to a SGTR: RCP restart criteria.

K/A MATCH ANALYSIS

The question tests knowledge of RCP restart criteria during a SGTR. The knowledge being tested is required for an applicant to have the ability to determine RCP restart criteria. Question is specifically worded as "NOT to prevent" because this clarifies the point that there are other parameters to look at prior to knowing enough to restart the pump. If the question was written as "conditions that would allow," then one could argue that there was not enough information to answer the question.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. RCPs should not be restarted if a loss of seal injection and a loss of thermal barrier cooling occurred until an eval of the RCPs is completed. Plausible since seal temperature < 220 °F.
- B. Correct. dP is > 200 psi (See App. B of 19030-C) and level is not an issue.
- C. Incorrect. Seal Temp < 220 F. Plausible because temp is close to being OK. Also, an eval needs to be performed prior to restart.
- D. Incorrect. Seal leakoff is slightly > limit of 5.5 gpm. Plausible because dP is OK.

REFERENCES

1. 19030-C, E-3 Steam Generator Tube Rupture, Rev. 30, 04/02/2004.
2. 13003-1, Reactor Coolant Pump Operation, Rev. 31, 02/17/2004.

33. 039A4.07 001/2/1/STEAM DUMPS/C/A 2.8/M/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- The reactor is at 90% Rated Thermal Power
- Rod control is in automatic with CBD at 196 steps
- All control systems are in their normal alignment
- Turbine load decreases to 850 MWe in 30 seconds
- PT-506 (turbine impulse pressure) sticks at 90%

Which ONE of the following is the correct response to this transient?

- A✓ The steam dump Tave controller generates a demand signal, but the steam dumps remain shut.
- B. The steam dump Tave controller generates a demand signal and Bank 1 opens.
- C. The steam dump Tave controller generates a demand signal and Banks 1 and 2 open.
- D. The steam dump Tave controller generates a demand signal and Banks 1, 2 and 3 open.

K/A

039 Main and Reheat Steam

A4.07 Ability to manually operate and / or monitor in the control room: Steam dump valves.

K/A MATCH ANALYSIS

The question tests the knowledge that is required to correctly monitor the steam dump system and recognize how it will respond when inputs to the system fail.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. A demand signal is generated due to the difference in Tref and Tavg. No arming signal is present because (C-7 not present) PT-506 must change by 10%/120 sec and it has stuck at its original value of 90%. The Tave mode would be the normal alignment, as noted in the question stem.
- B, C, D. Incorrect. No arming signal. Plausible because applicant would need to use data in stem to figure out what the demand would be if they believed there was an arming signal present. Applicants could think that dumps are armed because there is a load rejection.

REFERENCES

1. V-LO-TX21201, Steam Dumps, Rev. 1
2. V-LO-TX-27101, Rod Control, Rev. 1
3. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3
4. Question from Vogtle Exam Bank LO-LP-21000-00-01

34. 039K5.08 001/2/1/DUMPS REACTIVITY/C/A 3.6/N/VG05301/R/MAB/RSB

The following Unit 2 conditions exist after taking critical data during a reactor startup:

- Core Cycle Burnup = 15000 MWd/MTU
- Reactor Power is $2 \times 10^{-3}\%$
- RCS Temperature is being controlled at 557°F using steam dumps in their normal configuration
- A contact fails open in the steam pressure portion of the arming circuit for the steam dumps

Which ONE of the following correctly describes the effect on RCS temperature and reactivity?

- A. RCS temperature increases. Positive reactivity is added to the reactor.
- B✓ RCS temperature increases. Negative reactivity is added to the reactor.
- C. RCS temperature decreases. Positive reactivity is added to the reactor.
- D. RCS temperature decreases. Negative reactivity is added to the reactor.

ENSURE UTILITY VERIFIES VERBIAGE OF "CRITICAL APPROACH." WOULD THE UTILITY BE MORE LIKELY TO USE THE PHRASE "APPROACH TO CRITICAL?" OR WOULD THEY USE THE PHRASES INTERCHANGEABLY?

K/A

039 Main and Reheat Steam

K5.08 Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity.

K/A MATCH ANALYSIS

The steam pressure contact in the arming circuit failing open will close the air supply to the dumps, thus reducing steam demand. Reducing steam demand will affect RCS temp, which in turn affects reactivity. Therefore, the K/A is met because the operational implications of a change in steam removal is that the reactivity is affected.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. See correct answer for explanation. Plausible because applicant may not realize that the MTC will be negative for a critical approach at 1500 MWd/MTU and the RCS temperature actually will rise.
- B. Correct. The steam pressure contact opening will de-energize the arming relay, which de-energizes the solenoid, which blocks the air supply to the dump valve actuators. Therefore, the dumps are closed, reducing steam demand, causing an RCS heatup. Due to the core having 1500 MWd/MTU burnup, the MTC will be negative, which causes negative reactivity to be added during the heatup.
- C. Incorrect. See correct answer for explanation. Plausible because applicant may not realize that the MTC will be negative for a critical approach at 1500 MWd/MTU and applicant may not realize that opening of the contact will cause dumps to close.
- D. Incorrect. See correct answer for explanation. Plausible because applicant may not realize that opening of the contact will cause dumps to close.

REFERENCES

1. LO-LP-61201-20-C, Reactor Startup, Rev. 20, 02/22/2002, Page 8.
2. V-LO-TX21201, Steam Dumps, Pages 28 and 37.
3. 12003-C, Reactor Startup (Mode 3 to Mode 2), Rev. 39, 05/11/2004, Pages 5, 21, and 22.

35. 041K6.03 001/2/2/RODS STEAM DUMPS/C/A 2.7/N/VG05301/R/MAB/RSB

Unit 1 is at 100% rated thermal power with ALB10-B06, ROD CONTROL URGENT FAILURE, in alarm. Control Rods are in automatic mode. The turbine governor valves close unexpectedly resulting in a 10% load rejection over a 90 second period.

Which ONE of the following correctly describes how RCS temperature is controlled given the above conditions?

- A. RCS temperature will go down due to higher xenon concentration with no rod motion and no steam dump operation.
- B. RCS temperature will be controlled entirely by control rods because the power change is not enough to require steam dump operation.
- C✓ RCS temperature will be controlled entirely by steam dumps because the control rods will not move.
- D. RCS temperature will be controlled with a combination of control rods and steam dumps because the load rejection occurs quickly.

K/A

041 Steam Dump/Turbine Bypass Control

K6.03 Knowledge of the effect of a loss or malfunction on the following will have on the SDS: Controller and positioners, including ICS, S/G, CRDS.

K/A MATCH ANALYSIS

A malfunction of control rods exists as evidenced by the alarm. The effect on the steam dumps is that the dumps will actually be required to maintain RCS temp, which would not necessarily be the case if rods were able to automatically insert.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Steam dumps will operate as stated in correct answer. Plausible because rods will not operate and applicant may not make the connection that dumps are armed with a demand signal.
- B. Incorrect. Rods will not move due to the urgent failure. Plausible if applicant does not know that the alarm is indication that rods will not move because rods are capable of handling 10% load rejects without the help of the dumps.
- C. Correct. Rods will not move due to the urgent failure. Steam dumps will arm with a 10% rejection in less than 2 minutes. Therefore, with an arming signal and a Tave-Tref deviation (hence a demand signal), dumps will open.
- D. Incorrect. Rods will not move due to the urgent failure. Plausible if applicant does not know that the alarm is indication that rods will not move.

REFERENCES

- 1. V-LO-TX-21201, Steam Dumps.
- 2. V-LO-TX-27101, Rod Control.
- 3. ALB10-B06, ROD CONTROL URGENT FAILURE, Rev. 44, 04/28/2004.

36. 045K1.18 001/2/2/REACTOR TURBINE TRIP/C/A 3.6/B/VG05301/R/MAB/RSB

A secondary plant transient has occurred on Unit 1 resulting in the following plant conditions:

- Reactor and turbine power = 103%
- Both main feedwater pumps have tripped
- All steam generator levels are in the program band, but lowering rapidly
- Main feedwater flow indicators are at the bottom of the scale

Which ONE of the following correctly describes the initial automatic plant response to these conditions? (Reference Provided)

- A✓ Turbine trips immediately, which then causes the reactor to trip.
- B. Turbine trips immediately and the reactor trips on Lo-Lo Steam Generator Level.
- C. Turbine trips after a short time delay (less than a minute), which then causes the reactor to trip.
- D. Turbine trips after a short time delay (less than a minute) and the reactor trips on Lo-Lo Steam Generator Level.

PROVIDE THE APPLICANTS WITH: VOGTLE AMSAC VARIABLE TIMER GRAPH
IS A RATE OF LOWERING SG LEVEL NEEDED?

K/A

045 Main Turbine Generator

K1.18 Knowledge of the physical connections and / or cause-effect relationships between the MT/G system and the following systems: RPS.

K/A MATCH ANALYSIS

The question tests the knowledge that when power > P-9, a turbine trip will cause a reactor trip. The applicant must know this in order to get the question correct, therefore, the K/A is met. Question is closed book material because it only requires the applicant to know that there is no time delay above 102% reactor power, precluding the need to pull a specific time delay number from the AMSAC Variable Timer Chart.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Above 100% power there is no time delay for AMSAC, which will cause a turbine trip when both MWF Pps trip. The reactor trip, in turn, causes a turbine trip.
- B. Incorrect. The reactor will trip immediately due to the turbine trip. Plausible, because at certain power levels, the reactor will not trip on turbine trip, in which case the reactor would trip on lo-lo SG level.
- C. Incorrect. Turbine trips immediately. Plausible because rx will trip on turbine trip.
- D. Incorrect. Turbine trips immediately. Plausible because rx may trip on lo-lo SG level if there is a time delay on turbine trip.

REFERENCES

- 1. Lesson Plan, V-LO-TX-28101, RPS, SSPS, and AMSAC
- 2. Vogtle Requal Question RQ-SG-97200-28, LOLP28301, LO-TA-37014

37. 054AK3.02 001/1/1/MAIN FEEDLINE BREAK/C/A 3.4/M/VG05301/R/MAB/RSB

Unit 1 has the following indications:

- Plant is at end of life with 111 ppm boron in the RCS.
- Reactor power is at 100% Rated Thermal Power and approximately stable.
- Turbine load is 1200 MWe and approximately stable.
- Steam pressure is 970 psig and stable.
- #1 Steam Generator level is slowly trending down.
- ALB13-B01, STM GEN 1 FLOW MISMATCH, is illuminated.
- Containment pressure is 1 psig and slowly increasing.
- Containment radiation levels are normal.
- Main Feedwater Pump discharge pressure has started to drop.

Which ONE of the following correctly completes the statement regarding the plant response and reason for the response?

The #1 main feed regulating valve will INITIALLY modulate...

- A. open to try to maintain steam generator level as main feedwater pump speed increases.
- ☒ B. closed to try to maintain steam generator level by matching feed flow with steam flow.
- C. open to try to maintain steam generator level by matching feed flow with steam flow.
- D. closed to try to raise main feedwater pump discharge pressure.

This question was from the utility's bank, but ensure the utility verifies legitimacy of chosen parameters.

K/A

054 Loss of Main Feedwater

AK3.02 Knowledge of the reasons for the following responses as they apply to Loss of Main Feedwater (MFW): Matching of feedwater and steam flows.

K/A MATCH ANALYSIS

Indications are provided that are consistent with a main feedwater line break. The question tests how the MFRV responds in order to try to maintain SG level. The applicant must know why the MFRV responds as it does in order to get the correct answer. Therefore, the reason for matching feed and steam flows (to maintain SG Level) is being tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. The MFRV will initially close to try to match steam flows. Plausible because SG levels are going down, which may lead applicant to thinking that the initial MFRV response would be to raise SG level by opening. The lag feature in the SG level control causes this response. The system is level-dominant, but the steam and feed flow match is quicker to respond than the level function.
- B. Correct. The indications provided in the stem are consistent with a FW break in containment. The valve initially goes closed to match feed and steam flow. The break will cause indicated feed flow to go up, even though less feed will actually make it to the SG. The reason for this quick response is to maintain steam generator level, even though in this instance it actually makes the situation worse.
- C. Incorrect. MFRV will initially modulate closed. Plausible because SG levels are going down and it may be a logical assumption to think the MFRV will open to try to supply more feed. Also plausible because the applicant should know that the control system is designed to try to match feed and steam flow.
- D. Incorrect. MFW Pump speed is raised to maintain a dP across the MFRV, but the MFRV will respond to the feed flow / steam flow mismatch.

REFERENCES

- 1. Vogtle Bank Question LO-LP-60308-05-01.
- 2. V-LO-TX-21101, Main Steam System, Rev. 4.0.
- 3. Simulator Malfunction FW06.
- 4. V-LO-TX-18101, Condensate and Feedwater Text Part 1, Rev. 4.0.
- 5. V-LO-TX-18201, Condensate and Feedwater Text Part 2, Rev. 2.0.

38. 055EK1.02 001/1/1/NC NATURAL CIRCULATION/A 4.1/N/VG05301/R/MAB/RSB

The crew is performing 19101-C, ECA-0.1 Loss of All AC Power Recovery Without SI Required, and are attempting to verify natural circulation with the following conditions:

- Offsite power is not available
- Both emergency diesel generators are supplying their loads
- RCS subcooling is 22 °F
- Steam generator levels and pressures are stable
- Core exit thermocouples are stable
- RCS WR cold legs are at saturation temperatures for the steam generator pressures

Which ONE of the following describes the correct operator actions based on the above conditions?

- A. Open the steam dumps to lower steam generator pressures and cool the RCS.
- B✓ Open the steam generator ARVs to lower steam generator pressures and cool the RCS.
- C. Throttle closed the steam dumps to maintain the same steam generator pressures and conserve secondary inventory.
- D. Throttle closed ARVs to maintain the same steam generator pressures and conserve secondary inventory.

K/A

055 Station Blackout

EK1.02 Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Natural Circulation Cooling.

K/A MATCH ANALYSIS

The question tests knowledge of NC verification criteria and actions to take when parameters are not reading values that indicate NC has been established. The implications of not yet having NC are to steam the SGs to induce NC. Therefore, the question is matching the K/A testing operational implications (operator actions) of not having NC following a SBO.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Condenser is not available due to SBO. Plausible because dumping steam is the correct course of action.
- B. Correct. Step 13 of 19101-C. ARVs must be used because condenser is not available.
- C. Incorrect. Condenser is not available and procedure gives direction to dump steam at a higher rate if NC is not established. Plausible because the ability to maintain inventory is a concern with no power to transfer water to CST.
- D. Incorrect. Procedure gives direction to dump steam at a higher rate if NC is not established. Plausible because the ability to maintain inventory is a concern with no power to transfer water to CST.

REFERENCES

1. 19101-C, ECA-0.1 Loss of All AC Power Recovery Without SI Required, Rev. 20.1, 08/22/2003.

39. 056AK3.02 001/1/1/LOSS OF ALL AC/MEM 4.4/N/VG05301/R/MAB/RSB

During performance of 19100, ECA-0.0 Loss of All AC Power, operators encounter steps that have them open several electrical equipment room doors within 30 minutes of losing AC power (Step 15) and to depressurize the steam generators to 300 psig, but not less than 200 psig (Step 18).

Which ONE of the following correctly states the reasons (basis) for these two steps?

- A. If electrical equipment room doors are not opened within the time limit (30 minutes) a loss of control power could occur AND the steam generators must not be depressurized to less than 200 psig to prevent a steam bubble in the reactor vessel head.
- B✓ If electrical equipment room doors are not opened within the time limit (30 minutes) a loss of control power could occur AND the steam generators must not be depressurized to less than 200 psig to prevent injecting nitrogen from the accumulators.
- C. If electrical equipment room doors are not opened within the time limit (30 minutes) permanent damage to the station batteries due to reverse polarity may occur AND the steam generators must not be depressurized to less than 200 psig to prevent a steam bubble in the reactor vessel head.
- D. If electrical equipment room doors are not opened within the time limit (30 minutes) permanent damage to the station batteries due to reverse polarity may occur AND the steam generators must not be depressurized to less than 200 psig to prevent injecting nitrogen from the accumulators.

K/A

056 Loss of Off-site Power

AK3.02 Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Actions contained in EOP for loss of offsite power.

K/A MATCH ANALYSIS

The question tests the reasons behind Steps 15 and 18 of ECA-0.0, which are actions that must be taken when a loss of all AC occurs. A loss of all AC includes a loss of Offsite Power, along with EDGs failing to energize their respective safety buses; therefore, the K/A is met. This information, although it is basis-type information, is contained in caution statements and is appropriate for ROs to know.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Void creation is also incorrect. Plausible because in a quick cooldown situation, the reactor head will remain hot and create the potential for voids to form. This is not an issue even if voids do form, thus the reason is incorrect, but plausible.
- B. Correct. See caution statements prior to Steps 15 and 18 in 19100, ECA-0.0, and LP Page 7 and 9.
- C. Incorrect. Reverse polarity concerns are dealt with in Step 16, which provides guidance to open the battery breaker when voltage reaches < 105V dc. Plausible because reasons detailed in "A" regarding steam bubble formation. Also plausible because reverse polarity is an actual basis for a subsequent step.
- D. Incorrect. Reverse polarity concerns are dealt with in Step 16, which provides guidance to open the battery breaker when voltage reaches < 105V dc. Plausible because nitrogen injection is the actual concern with depressing. Also plausible because reverse polarity is an actual basis for a subsequent step.

REFERENCES

1. 19100, ECA-0.0 Loss of All AC, Rev. 28, 12/19/2003.
2. LO-LP-37031-15-C, Loss of All AC Power, Rev. 15, 12/14/2000.

40. 057AA1.04 001/1/1/VCT AUTO SWAPOVER/C/A 3.5/M/VG05301/R/MAB/RSB

The following Unit 1 conditions exists:

- The plant is in its normal configuration.
- PRZR level control is selected to 459/460
- PRZR pressure control is selected to 455/456
- 1AY1A, 120V AC Vital Instrument Distribution Panel, de-energizes due to a fault.
- CCP-1B is running and charging flow raises to 150 gpm.

Which ONE of the following correctly describes the response of the Centrifugal Charging Pumps (CCP) suction supply valves from the VCT and RWST over the next 15 minutes (assume no operator action)?

- A. LV-0112E (RWST to CCPs) opens and LV-0112C (VCT to CCPs & NCPs) closes. LV-0112D (RWST to CCPs) and LV-0112B (VCT to CCPs & NCPs) will not reposition.
- B. LV-0112D (RWST to CCPs) opens and LV-0112B (VCT to CCPs & NCPs) closes. LV-0112E (RWST to CCPs) and LV-0112C (VCT to CCPs & NCPs) will not reposition.
- C✓ LV-0112D and E (RWST to CCPs) open and LV-0112B and C (VCT to CCPs & NCPs) close.
- D. LV-0112D and E (RWST to CCPs) and LV-0112B and C (VCT to CCPs & NCPs) will not reposition.

Major revision provided by utility on 05/24/2005.

K/A

057 Loss of Vital AC Inst. Bus

AA1.04 Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: RWST and VCT valves.

K/A MATCH ANALYSIS

1AY1A is a vital instrument AC panel. The VCT and RWST supplies to the charging pumps reposition due to the failure.

ANSWER / DISTRACTOR ANALYSIS

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

REFERENCES

1. V-LO-TX-09101, Chemical and Volume Control System, Rev. 3.0.
2. Farley 2003-301 RO Exam Question 057AA1.04.

41. 058AA2.02 001/1/1/LOSS OF DC BUS/C/A 3.3/M/VG05301/R/MAB/RSB

Unit 1 has the following conditions:

- Unit is at 100% power
- Diesel Generator '1A' is paralleled with its safety bus for surveillance
- Pressurizer pressure control is selected to 455/456
- Pressurizer level control is selected to 459/460

The crew notes that the following Main Control Room annunciators are received followed by an automatic reactor trip.

- 125V DC SWGR 1AD1 TROUBLE
- 125V DC MCC 1AD1M TROUBLE
- 125V DC PNL 1AD12 TROUBLE
- 120V AC PANELS 1AY1A 1AY2A TROUBLE
- INVERTERS 1AD1I1 1AD1I11 TROUBLE
- 125V DC PNL 1AD11 TROUBLE

Which ONE of the following correctly describes the plant response?

- A. The reactor trips on Pressurizer High Pressure.
Diesel Generator 1A output breaker opens.
- B✓ The reactor trips on Pressurizer High Pressure.
Diesel Generator 1A output breaker remains closed.
- C. The reactor trips on OT-delta-T.
Diesel Generator 1A output breaker opens.
- D. The reactor trips on OT-delta-T.
Diesel Generator 1A output breaker remains closed.

K/A

058 Loss of DC Power

AA2.02 Ability to determine and interpret the following as they apply to Loss of DC Power: 125 V dc bus voltage, low/critical low, alarm.

K/A MATCH ANALYSIS

Part of interpreting the alarms is verifying the expected plant response based on those alarms. This question provides a plant situation where the operator is provided with indications of a loss of DC and part of the interpretation of the alarms is verifying why the reactor tripped and whether or not the EDG responded as expected based on those conditions.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Output breaker does not open.
- B. Correct. Output breaker fails as-is. Loss of 1AD1 creates a loss of 1AT1A. Loss of 1AY1A causes controlling P to fail low and all Pzr heaters energize and only one PORV (PV-456) is available.
- C. Incorrect. Reactor will trip on Hi Pzr P. Plausible because OTdT actually trips the reactor if normal pressure control is available.
- D. Incorrect. Reactor will trip on Hi Pzr P. Plausible because OTdT actually trips the reactor if normal pressure control is available.

This question was validated on the Vogtle simulator under many different conditions and every time the plant trips on Hi Pzr p within a few seconds of losing the dc bus.

REFERENCES

1. Vogtle Bank Question LO-LP-60329-02-09.
2. Vogtle Bank Question LO-LP-60329-02-10.
3. LO-LP-60329-06, Loss of 125V DC Power, Rev. 6, 02/28/2002.
4. 18034-1, Loss of Class 1E 125V DC Power, Rev. 7.1, 11/03/2003.
5. 17034-1, 125V DC SWGR 1AD1 TROUBLE, Rev. 16, 08/12/2004.

42. 059A4.12 001/2/1/FWI FEEDWATER ISOLAT/MEM 3.4/B/VG05301/R/MAB/RSB

If Train 'B' Reactor Trip Breaker fails to open on a reactor trip, which ONE of the following correctly states the effect this will have on the Low Tavg/P-4 Feedwater Isolation Signal as RCS temperature decreases?

- A. No FWI signal will be generated when RCS temperature lowers to 564 °F.
- B. Only Train A FWI signal will be generated and only two Main Feedwater Isolation Valves will close when RCS temperature lowers to 564 °F.
- C. Both Train A and Train B FWI signals will be generated and all four Main Feedwater Isolation Valves will close when RCS temperature lowers to 564 °F.
- D. Only Train A FWI signal will be generated and all four Main Feedwater Isolation Valves will close when RCS temperature lowers to 564 °F.

K/A

059 Main Feedwater

A4.12 Ability to manually operate and / or monitor in the control room: Initiation of automatic feedwater isolation.

K/A MATCH ANALYSIS

Part of monitoring is to correctly anticipate what is supposed to happen. Therefore, the K/A is matched because it tests the knowledge of how the FWI should respond when a RTB fails to open.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. A Train FWIS is generated. Plausible because it may be a misconception that both trains of P-4 are needed for the FWIS.
- B. Incorrect. All FWIVs close. Plausible because it may be a misconception that the A Train FWIS will isolate two loops of FW and the B Train will isolate the other two loops of FW.
- C. Incorrect. RTB being open prevents a B Train FWIS. Plausible because all FWIVs do actually close even without the B Train FWIS.
- D. Correct. P-4 is train-specific; however, a FWIS is generated and all FWIVs close when 564 °F is reached.

REFERENCES

1. Vogtle Bank Question, LO-LP-18201-07-09
2. Lesson Plan V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3
3. Lesson Plan V-LO-TX-18201, Condensate and Feedwater Part 2, Rev. 2.0

43. 059K3.03 001/2/1/SG STEAM GENERATOR/C/A 3.5/M/VG05301/R/MAB/RSB

Given the following Unit 1 conditions:

- Control rods are in manual
- Reactor Power is at 50% Rated Thermal Power with all secondary control systems in automatic.
- FT-512 (#1 SG Controlling Steam Flow) is selected and fails high.

Which ONE of the following correctly describes the effects of the failure assuming no operator action?

- A✓ Initially #1 FRV opens and #1 SG level rises rapidly. Main Feedwater Pump speed increases.
- B. Initially #1 FRV opens and #1 SG level rises rapidly. Main Feedwater Pump speed decreases.
- C. Initially #1 FRV closes and #1 SG level lowers rapidly. Main Feedwater Pump speed increases.
- D. Initially #1 FRV closes and #1 SG level lowers rapidly. Main Feedwater Pump speed decreases.

K/A

059 Main Feedwater

K3.03 Knowledge of the effect that a loss or malfunction of the MFW will have on the following: S/Gs.

K/A MATCH ANALYSIS

Main feedwater is affected by the steam flow transmitter failure, which affects the SG level. Therefore, the question tests knowledge of a MFW failure and the effect it has on SGs.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Initially feed flow will try to match steam flow, which will cause #1 FRV to open. The steam flow is an input to the MFW Pump speed controller and will cause the speed to increase to maintain programmed dP.
- B. Incorrect. MFWP speed increases. Plausible because #1 FRV does open.
- C. Incorrect. #1 FRV opens due to the failure. Plausible because MFWP speed increases.
- D. Incorrect. #1 FRV opens due to the failure. MFWP speed increases. Plausible because there is a high SG level which may lead applicant to believe that MFWP speed will lower.

REFERENCES

- 1. Vogtle Exam Bank Question LO-LP-21101-07-04.
- 2. Vogtle Simulator Malfunction Guide SG05.

44. 061A2.08 001/2/1/AFW DISCHARGE VALVE/C/A 2.7/N/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- The reactor has tripped
- E-0, Reactor Trip or Safety Injection, is being performed (Operators are at Step 19, verifying adequate AFW flow)
- Containment radiation levels are 2×10^5 Rad/hr
- Containment pressure is 3.0 psig
- The "A" motor driven AFW pump is tagged out for maintenance
- The "B" motor driven AFW pump is operating with its discharge valves full open
- The turbine driven AFW pump failed to automatically start and operators have not yet attempted a manual start
- All steam generator narrow range levels are 29% NR and slowly going down
- Total AFW flow is 550 gpm

Which ONE of the following correctly states the RO's required procedural action to address the above secondary heat removal issues?

- A. Trip all RCPs.
- B✓ Start the TDAFW pump.
- C. Start the TDAFW pump when SG levels reach 10% NR.
- D. Commence RCS feed and bleed.

K/A

061 Auxiliary/Emergency Feedwater

A2.08 Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Flow rate expected from various combinations of AFW pump discharge valves.

K/A MATCH ANALYSIS

A malfunction exists because the AFW flow is less than expected for one MDAFW pump with discharge valves full open. The operator must take procedural action to correct the lowering SG levels.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Conditions for tripping RCPs not yet met. Plausible because FR-H.1 does have actions for tripping RCPs when heat sink problems are present.
- B. Correct. E-0 requires that the TDAFW pump be started under these conditions (see Step 19).
- C. Incorrect. Plausible because the TDAFW pump does need to be started, but the conditions for starting it are currently met.
- D. Incorrect. SG WR level conditions must be less than 44% in 3 SGs to go to feed and bleed. Plausible because applicant could confuse requirements for WR and NR levels.

REFERENCES

- 1. 19000-C, E-0, Reactor Trip or Safety Injection, Rev. 29, 6/25/2004.
- 2. 19231-C, FR-H.1 Response to Loss of Secondary Heat Sink, Rev. 26.5, 4/14/2003.
- 3. 19235-C, FR-H.5 Response to SG Low Level, Rev. 9.1, 8/28/2000.
- 4. LO-LP-37002-14-C, Format and Use of EOP's, Rev. 14, 12/31/2002 (provided for verification of containment adverse number requirements).

45. 062A1.01 001/2/1/DIESEL EDG/MEM 3.4/B/VG05301/R/MAB/RSB

The following conditions were noted during the last Emergency Diesel Generator (EDG) test run:

- The EDG was loaded at a rate of 200 kW/min
- The maximum load attained was 7000 kW
- The maximum reactive loading was 1000 kVars negative (in)
- The output voltage was stable at 4090 Vac

Which ONE of the following was in violation of the EDG limitations?

- A. Load rate (kW/min)
- B. Load (kW)
- C. Reactive load (kVar)
- D. Output voltage (Vac)

K/A

062 AC Electrical Distribution

A1.01 Ability to predict and / or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ac distribution system controls including: Significance of D/G load limits.

K/A MATCH ANALYSIS

To effectively monitor the EDG, the applicant must possess a knowledge of the design limits of the EDG. This K/A tests the reactive loading limit of the EDG.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. The load may be raised at 1000 kW every 5 minutes. Plausible because 200 kW/min is at the upper limit.
- B. Incorrect. 7000 kW is equal to the max sustained load limit. Plausible because the load is at the upper limit.
- C. Correct. The EDG is procedurally restricted from having a leading kVar (kVars "in").
- D. Incorrect. The output voltage is equal to the limit of what is allowed prior to breaker closure. Plausible because the voltage is lower than normal.

REFERENCES

1. 13145-1, "Diesel Generators", Ref. 56, 7/22/2004.
2. 13427-1, "4160V AC 1E Electrical Distribution System", Rev. 34.1, 8/1/2003.
3. Surry Exam SR04301, 062A1.01.

46. 062A3.05 001/2/1/LOSP SEQUENCER/C/A 3.5/M/VG05301/R/MAB/RSB

The following conditions exist on Unit 1:

- A small break LOCA has occurred
- Safety Injection has just been reset
- CCW pump 1 has just undergone a complete shear of its shaft

Which ONE of the following, assuming no operator action, correctly describes the status of the plant loads one minute after the Diesel Generator Output Breakers close following a complete loss of offsite power?

- A. ACCW Pump 1 is running AND CCW Pumps 1, 3, and 5 are running.
- B. ACCW Pump 1 is running AND CCW Pumps 1 and 3 are running with CCW Pump 5 not running.
- C. RHR Pump A is running AND CCW Pumps 1, 3, and 5 are running.
- D. RHR Pump A is running AND CCW Pumps 1 and 3 are running with CCW Pump 5 not running.

Utility provided major revision on 05/24/2005 that changed the correct answer from "B" to "A".

K/A

062 AC Electrical Distribution

A3.05 Ability to monitor automatic operation of the ac distribution system, including: Safety-related indicators and controls.

K/A MATCH ANALYSIS

The question tests the knowledge of how the electrical distribution system is designed to work given the conditions presented in the question.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. CCW Pump 5 will have started on low header P. At 36 sec the auto/manual block times out and allows CCW pump 5 to start on low header P.
- B. Incorrect.
- C. Incorrect.
- D. Incorrect.

REFERENCES

1. Modified from WB020301 question 062A3.05 (same K/A).
2. Lesson Plan V-LO-TX-28201, Sequencer.
3. Lesson Plan V-LO-TX-10101, CCW. (Ref provided to support plausibility of distractors)

47. 062G2.1.32 001/1/1/SERVICE WATER NSCW/MEM 3.4/N/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- 18021-C, Loss of Nuclear Service Cooling Water System, has been entered and operators are at the point in the procedure where they are going to place one train of Nuclear Service Cooling Water in service in single pump operation.
- The pump that is going to be started previously tripped on a spurious overcurrent.

Which ONE of the following correctly describes precautions and limitations for starting the nuclear service cooling water pump and placing loads in service under these conditions?

- A✓ The electrical lockout relay for the pump to be started must be reset prior to pump start. Following pump start, system flow is adjusted to prevent pump runout.
- B. The electrical lockout relay for the pump to be started does not need to be reset prior to pump start. Following pump start, system flow is adjusted to prevent pump runout.
- C. The electrical lockout relay for the pump to be started must be reset prior to pump start. Following pump start, the supply header pressure is restricted to prevent overpressure condition in the discharge piping.
- D. The electrical lockout relay for the pump to be started does not need to be reset prior to pump start. Following pump start, the supply header pressure is restricted to prevent overpressure condition in the discharge piping.

K/A

062 Loss of Nuclear Svc Water

G2.1.32 Ability to explain and apply all system limits and precautions.

K/A MATCH ANALYSIS

A loss of NSCW has occurred and the crew is preparing to take mitigating actions for the event. The question tests knowledge in the SOP's Precautions and Limitations Section associated with restoring NSCW. Therefore, the question is testing the applicant's ability to explain and apply system limits and precautions during a loss of NSCW event.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. See 13150-1, Step 2.1.4 and 2.1.7.
- B. Incorrect.
- C. Incorrect.
- D. Incorrect.

REFERENCES

- 1. 13150-1, Nuclear Service Cooling Water System, Rev. 32, 08/04/2003.
- 2. 18021-C, Loss of Nuclear Service Cooling Water, Rev. 13, 11/03/2003.

48. 063A4.01 001/2/1/CONTROL FUSE BREAKER/C/A 2.8/B/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Reactor startup is in progress
- Reactor power has stabilized at $2 \times 10^{-3}\%$ Intermediate Range
- Intermediate Range channel N-35 was declared inoperable and removed from service

Which ONE of the following describes the plant response if an I&C Technician mistakenly removes control power fuses for N-35 instead of instrument power fuses while performing AOP-18002-C, "Nuclear Instrumentation System Malfunction"?

- A. The source range detectors, N-31 and N-32, are automatically reinstated because the P-6 permissive clears.
- B. The reactor trip breakers indicate closed because the trip signal was blocked by the P-6 permissive.
- C. The bistables for reactor trip and rod withdrawal block de-energize, however reactor trip breakers indicate closed.
- D. The level trip bypass is lost and the reactor trip breakers indicate open.

(I NEED UTILITY'S HELP WITH VALIDATION AND DISTRACTOR ANALYSIS)

K/A

063 DC Electrical Distribution

A4.01 Ability to manually operate and / or monitor in the control room: Major breakers and control power fuses.

K/A MATCH ANALYSIS

This question matches the K/A because it tests the applicant's ability to monitor both the operation of the control power fuses and the affect the removal of control power fuses will have on the reactor trip breakers.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. I do not think P-6 clears???
- B. Incorrect. RTBs will open.
- C. Incorrect. RTBs will open.
- D. Correct. According to Vogtle's exam bank, this is correct.

REFERENCES

1. Vogtle Exam Bank Question LO-LP-17103-09-01.
2. Lesson Plan V-LO-TX-28101, RPS-SSPS-AMSAC.
3. Lesson Plan V-LO-TX-17201, Source and Intermediate Range Nuclear Instruments.

49. 064G2.2.23 001/2/1/EDG TECH SPEC TS/MEM 2.6/N/VG05301/R/MAB/RSB

Which ONE of the following correctly describes required actions of Technical Specification LCO 3.8.1 (AC Sources - Operating; Modes 1, 2, 3, and 4) Action Statement B (One DG Inoperable)?

- A. Suspend fuel movements in the Spent Fuel Pool immediately and verify SAT available within 1 hour.
- B✓ Verify correct breaker alignment for each required offsite source within 1 hour and verify SAT available within 1 hour.
- C. Initiate action to suspend the operations involving reactivity additions immediately and verify SAT available within 1 hour.
- D. Verify indicated power available for each required offsite circuit within 1 hour and suspend fuel movements in the Spent Fuel Pool immediately.

K/A

064 Emergency Diesel Generator

G2.2.23 Ability to track limiting conditions for operations.

K/A MATCH ANALYSIS

K/A is met because the question tests the applicant's knowledge of one hour or less Tech Spec LCOs.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. SFP fuel moves do not need to be suspended. Plausible because TS 3.8.10 contains the requirement to suspend irradiated fuel moves. Also, verifying SAT available is correct. (Partially correct distractor)
- B. Correct. Plant is in Mode 4 ($T_{avg} > 200^{\circ}\text{F}$). TS 3.8.1 Action B provides the info for the correct answer.
- C. Incorrect. Boration does not need to be suspended. Plausible because TS 3.8.10 contains the requirement to suspend positive reactivity additions. Also, verifying SAT available is correct. (Partially correct distractor)
- D. Incorrect. SFP fuel moves do not need to be suspended. Plausible because TS 3.8.10 contains the requirement to suspend irradiated fuel moves. Also, verifying indicated power available for each required offsite circuit is correct. (Partially correct distractor)

REFERENCES

1. Technical Specification Table 1.1-1, "Modes"
2. Technical Specification 3.8.1, "AC Sources - Operating"
3. Technical Specification 3.8.2, "AC Sources - Shutdown"
4. Technical Specification 3.8.10, "Distribution Systems - Shutdown"

50. 065AA1.03 001/1/1/INSTRUMENT AIR/MEM 2.9/B/VG05301/R/MAB/RSB

Unit 1 has the following conditions:

- An inadvertent SI has occurred.
- The SI signal has not yet been reset.
- 1HV-9378, Instrument Air to Containment, is shut.

Which ONE of the following describes the reason for 1HV-9378 being shut and the actions required to restore instrument air to containment?

- A. 1HV-9378 went shut due to a CVI signal caused by the SIS. To open 1HV-9378, the SIS must be reset which will then allow the CVI to be reset allowing the valve to be reopened using the QMCB handswitch.
- B. 1HV-9378 went shut due to a CIA signal caused by the SIS. The SIS must be reset to allow CIA to be reset. After CIA is reset, 1HV-9378 can be opened from the QMCB.
- C. 1HV-9378 went shut as a direct result of the SIS. The only way to open the valve is to locally open the valve using the handwheel OR reset SI and then open 1HV-9378 from the QMCB.
- D✓ 1HV-9378 went shut due to a CIA signal caused by the SIS. The CIA can be reset without resetting SI and then open 1HV-9378 from the main control board.

K/A

065 Loss of Instrument Air

AA1.03 Ability to operate and/or monitor the following as they apply to Loss of Instrument Air: Restoration of systems served by instrument air when pressure is regained.

K/A MATCH ANALYSIS

Question tests knowledge needed to have the ability to restore instrument air to containment following a loss of instrument air due to CIA.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. 9378 closes due to CIA. Plausible because CVI and CIA are both caused by an SIS.
- B. Incorrect. SIS does not need to be reset prior to reset of CIA. Plausible because it is logical to assume that the initiating signal would first need to be reset.
- C. Incorrect. SIS does not directly cause 9378 to close. Plausible because manual operation is possible and 9378 does close following an SIS, but not as a direct result of SIS.
- D. Correct. See referenced LP.

REFERENCES

- 1. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3.
- 2. P&ID 1X4DB186-4, Instrument Air System Containment Building, Rev. 12.
- 3. Voglt Bank Question LO-LP-02110-14-01.

51. 068K6.10 001/2/2/LIQUID GAS RADIATION/C/A 2.5/N/VG05301/R/MAB/RSB

Prior to liquid radwaste release, all associated equipment is verified to be operable and all normal sample and approval processes have been completed.

Waste Monitor Tank 009 is in the process of being released on Unit 1 when power to the DPM for RE-018 (Liquid Waste Monitor) is lost due to an error made by an electrician.

Which ONE of the following correctly explains the affect on the liquid radwaste release?

- A. Liquid Radwaste Isolation Valve RV-018 closes. RV-018 may be immediately re-opened to allow the release to continue.
- B✓ Liquid Radwaste Isolation Valve RV-018 closes. RV-018 may not be immediately re-opened to allow the release to continue.
- C. Liquid Radwaste Isolation Valve RV-018 remains open. Immediately close the valve from the control room to stop the release.
- D. Liquid Radwaste Isolation Valve RV-018 remains open. The valve can not be controlled from the control room, therefore, immediately instruct an operator in the field to close the valve to stop the release.

Utility needs to verify that the power failure has the effect of not closing the valve (or closing the valve). Some detectors are designed to send a close signal if they lose power, and I am not seeing any info that says that this detector will perform like this.

Utility has now verified that if power is lost to the panel that RV-018 closes. (5/11/05)
Loss of power to the DPM results in de-energizing the relay causing the valve to close.

K/A

068 Liquid Radwaste

K6.10 Knowledge of the effect of a loss or malfunction on the following will have on the Liquid Radwaste System: Radiation monitors.

K/A MATCH ANALYSIS

The malfunction is that the monitor has lost power. The effect of that malfunction is that RV-018 will remain open and the operator must take action to close the valve in the field to stop the release. The release must be stopped until a second independent sample can be drawn and analyzed.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. 2 independent samples must be analyzed prior to restarting. Plausible because Valve does close.
- B. Correct. Valve does close. 2 independent samples must be analyzed prior to restarting.
- C. Incorrect. Valve closes and even if it did not, it cannot be closed from the control room. Plausible because applicant's may not be familiar with control of the valve or failure mechanism.
- D. Correct. Valve closes. Plausible because if the valve did not close, then the valve must be closed in the field because two independent samples have not yet been drawn and analyzed.

REFERENCES

- 1. V-LO-TX-32101, Digital Radiation Monitoring System.
- 2. V-LO-TX-47101, Liquid Waste Processing System, Rev. 1.0.
- 3. 13216-1, Liquid Waste Release, Rev. 32, 08/05/2004.

52. 073K1.01 001/2/1/RADIATION MONITOR/MEM 3.6/N/VG05301/R/MAB/RSB

Which ONE of the following will cause a CVI when reading full scale high?

- A✓ RE-2565A (Cnmt Vent)
- B. RE-004 (Cnmt Access Hatch)
- C. RE-2562A (Cnmt Atmos)
- D. RE-005 (Cnmt - High Range)

K/A

073 Process Radiation Monitoring

K1.01 Knowledge of the physical connections and / or cause-effect relationships between the PRM system and the following systems: Those systems served by PRMs.

K/A MATCH ANALYSIS

Correct answer contains a Cnmt Vent Monitor, which is a Process Rad Monitor. When RE-2565A alarms, it causes a CVI. Therefore, the cause-effect relationship between the Process Rad Monitor and a system served by it is being tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Reference material makes this obvious. Memory level question.
- B. Incorrect. RE-004 does not cause CVI.
- C. Incorrect. RE-2562A does not cause CVI.
- D. Incorrect. RE-005 does not cause CVI.

All distractors are plausible due to being installed plant radiation monitors.

REFERENCES

1. Lesson Plan V-LO-TX-32101, Digital Radiation Monitoring System, Rev. 0.

53. 076K2.08 001/2/1/SERVICE WATER NSCW/MEM 3.1/N/VG05301/R/MAB/RSB

The following conditions existed on Unit 1 prior to a simultaneous loss of offsite power (LOSP) and safety injection (SI):

- Unit operating at 100% rated thermal power
- Nuclear Service Cooling Water (NSCW) was in its normal configuration

Following the LOSP/SI, the electrical busses supplying the NSCW pumps energize from the Emergency Diesel Generators.

Which ONE of the following is correct with respect to restoration of NSCW?

- A. Due to the NSCW pump supply breakers remaining closed on the LOSP, the NSCW pumps immediately start and begin to deliver full flow upon energization of the respective electrical busses.
- B. The NSCW pumps immediately begin to deliver full flow after being started via the undervoltage load sequencer.
- C. The NSCW pumps begin to deliver full flow approximately 15 seconds after being started via the undervoltage load sequencer.
- D✓ The NSCW pumps begin to deliver full flow approximately 60 seconds after being started via the undervoltage load sequencer.

IS IT POSSIBLE TO COME UP WITH A BETTER DISTRACTOR THAN "A"?

K/A

076 Service Water

K2.08 Knowledge of bus power supplies to the following: ESF-actuated MOVs.

K/A MATCH ANALYSIS

The K/A is met because the applicant must have knowledge of whether the NSCW pump discharge MOVs on the running pumps will immediately regain power upon start of the EDG, regain power via the UV sequencer, or perhaps never regain power (but the valves were open when the LOSP and SI occurred so flow would immediately begin when the pump starts). The discharge MOVs are actuated with a LOSP and SI.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. The supply breakers are opened and sequenced on. Plausible because applicant may not realize that NSCW pumps are load shed and the system was just in operation, so assuming that the discharge valve does not need to be closed (full system flow) is logical, but wrong.
- B. Incorrect. Full flow is not immediately obtained due to the discharge MOVs being closed. Plausible because if the applicant were to think that the valves never regained power after the LOSP occurred, then full flow would occur upon pump start.
- C. Incorrect. The discharge MOVs will remain closed for 45 seconds after the pump is started. Plausible because the valve stroke time is 15 seconds. The applicant may have a memory lapse and correlate a 15 second valve stroke time with a full flow condition.
- D. Correct. The discharge MOV will remain closed for 45 seconds, followed by a 15 second valve stroke time. Therefore, full flow will be established about 60 seconds after pump start.

REFERENCES

- 1. V-LO-TX-06101, Nuclear Service Cooling Water System.
- 2. P&ID, 1X4DB133-1, Rev. 23.

54. 078K1.01 001/2/1/SUPERVISORY SENSOR/C/A 2.8/N/VG05301/R/MAB/RSB

A fuseable link in a Preaction Fire Protection system with supervisory air has developed a leak. A loss of supervisory air is occurring.

Which ONE of the following is the correct system response?

- A. The clapper valve will trip open making the system wet. Full sprinkler flow will not occur (except for leakage).
- B. The clapper valve will trip open and full sprinkler flow through the fuseable link occurs.
- C✓ An alarm will alert the control room operators of the problem. No sprinkler flow occurs and the system remains dry.
- D. An alarm will alert the control room operators of the problem. The leaking fuseable link will allow the system to become wet, but sprinkler flow will not occur.

K/A

078 Instrument Air

K1.01 Knowledge of the physical connections and / or cause-effect relationships between the IAS and the following systems: Sensor air.

K/A MATCH ANALYSIS

The K/A is met because the question requires knowledge of the loss of supervisor air, which is supplied by the IAS. Instrument air is being lost via the supervisory air.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Plausible since low air pressure could be linked with actuation of the clapper valve which would make the system wet.
- B. Incorrect. Plausible, since low air pressure could be linked with actuation of the clapper valve which would make the system wet and water would flow through the open fuseable link.
- C. Correct. The low air pressure will result in a trouble alarm. This will not affect the position of the clapper.
- D. Incorrect. Plausible since the control room alarm will be generated and the applicant may not know the flowpath is via the clapper valve then the link, vice the link then the clapper valve.

REFERENCES

1. V-LO-TX-43101, Fire Protection System, Pages 11 and 12.

55. 079A2.01 001/2/2/INSTRUMENT AIR/C/A 2.9/M/VG05301/R/MAB/RSB

Unit 1 is at 100% Rated Thermal Power (RTP) and Unit 2 is at 25% RTP. Two instrument air compressors are available on Unit 1, one of which is the swing compressor.

Two instrument air compressors are running on Unit 2, with the third compressor unavailable. The following Unit 2 alarms annunciate while instrument air pressure continues to lower:

- INST AIR EQUIP LO PRESS
- SERVICE AIR LO PRESS

18028-C, Loss of Instrument Air, is being implemented.

Which ONE of the following correctly states the actions that should be performed by the operators?

- A. Open the cross tie valve to supply Unit 2 air header from Unit 1.
- B. Re-align the swing compressor from Unit 2 to Unit 1.
- C✓ Verify isolation of service air (PV-9375) for Unit 2 and trip the reactor.
- D. Trip the turbine and isolate service air (PV-9375) for Unit 2.

K/A

079 Station Air

A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the SAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Cross-connection with IAS.

K/A MATCH ANALYSIS

Given the stated scenario, the operators must know the requirement to isolate service air from instrument air (SAS x-connection with IAS). Procedures give the guidance to perform the isolation. The question also tests the predictions of the impacts implicitly because the procedural actions are based on the impacts. Knowledge of the specific details of subsequent procedure steps is not required to answer this question, but knowledge of system design and capacity are required, as well as reactor trip criteria. These are all closed book required items for both RO and SRO applicants.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. There is evidence of a leak and Unit 1 supplies common loads and requires a second compressor to meet the demand.
- B. Incorrect. There is evidence of a leak and Unit 1 supplies common loads and requires a second compressor to meet the demand.
- C. Correct. 18028-C, Step A3 and A7.
- D. Incorrect. AP gives guidance to trip rx, not turbine. Plausible because isolation of service air is correct. (Partially correct distractor).

REFERENCES

- 1. 18028-C, Loss of Instrument Air, Rev. 23, 11/03/2003.
- 2. Lesson Plan, LO-LP-60321-13-C, Page 6 - 8.
- 3. Lesson Plan, V-LO-TX-02101, Service and Instrument Air.
- 4. ALB01B06, INST AIR EQUIP LO PRESS, Rev. 28, 01/11/2004.
- 5. ALB01C06, SERVICE AIR LO PRESS, Rev. 28, 01/11/2004.
- 6. Vogtle Requal Exam Bank, RQ-SG-94100-60, LOLP60321, LO-TA-60007

56. 086A3.02 001/2/2/FIRE PROTECTION/C/A 2.9/B/VG05301/R/MAB/RSB

The following sequence of events occurs:

- Both Units were operating at 100% power.
- Diesel Generator (DG) 1A is in an extended outage period and is unavailable
- Both Unit 1 Reserve Auxiliary Transformers (RAT) trip
- DG 1B starts and then trips on overspeed
- You receive a report that RAT 1A is on fire

Which ONE of the following correctly describes the automatic response of the fire detection and protection given the above sequence of events?

- A. The fire detection system will detect the fire. The diesel fire pump(s) will start, but the clapper valve(s) must be manually tripped.
- B. The fire detection system will not detect the fire. The diesel fire pump(s) must be manually started by pulling up the lever on the Primary Emergency Start Contactor.
- C. The fire detection system will not detect the fire. The diesel fire pump(s) must be manually started using the Alternate Emergency Start Contactor.
- D✓ The fire detection system will detect the fire. The diesel fire pump(s) will start and deliver water to RAT 1A without operator action.

K/A

086 Fire Protection

A3.02 Ability to monitor automatic operation of the Fire Protection System including:
Actuation of the FPS.

K/A MATCH ANALYSIS

An operator must know what to anticipate for system operation in order to effectively monitor the system. Therefore, the K/A is met because the applicant must know how the system should automatically respond given the sequence of events presented in the question.

ANSWER / DISTRACTOR ANALYSIS

A, B, C Incorrect. The diesel pumps will deliver flow automatically. All are plausible because they are likely answers with a lack of backup power supply knowledge.

D. Correct. Battery backup exists for detection and diesel fire pump starting. The system will flow water to the RAT without any operator action.

REFERENCES

1. V-LO-TX-22101, Fire Detection.
2. V-LO-TX-43101, Fire Protection.
3. Vogtle Exam Question LO-LP-22101-04-02.

57. 103K4.06 001/2/1/CONTAINMENT SI CIS/MEM 3.1/B/VG05301/R/MAB/RSB

The RCDT is aligned to the auxiliary building for liquid processing. Which ONE of the following correctly describes how the discharge flowpath would be affected if a safety injection (SI) were to occur?

- A. Discharge operations will not be affected by the SI.
- B. The discharge header isolation valves receive a close signal directly from the SI.
- C✓ The SI signal will result in a containment isolation actuation (CIA), which will directly close the discharge header isolation valves.
- D. The SI signal causes a CIA that will result in a loss of instrument air to containment, which will cause the RCDT discharge header isolation valves to close.

K/A

103 Containment

K4.06 Knowledge of containment system design feature(s) and / or interlock(s) which provide for the following: Containment isolation system.

K/A MATCH ANALYSIS

K/A is met because the question tests knowledge of what causes a CIS and then how that signal affects two isolation valves. Therefore, design features of containment isolation are being tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. SI will create a CIS, thus affecting discharge operations. Plausible because applicant could think that discharge operations would not be affected unless there was an obvious containment problem. SI is not necessarily indicative of a containment problem.
- B. Incorrect. SI will create a CIS, which then closes valves. SI does not send a signal directly to valves. Plausible because applicants may know that valves go closed on a SI, but they may not know what signal closes them.
- C. Correct. As noted in referenced lesson plan and P&ID.
- D. Incorrect. Valves will already be closed when they lose air. Plausible because air to ctmt is lost on a CIS.

REFERENCES

- 1. Vogtle Exam Bank Question LO-LP-16801-01-02
- 2. Lesson Plan V-LO-TX-28101, RPS-SSPS-AMSAC
- 3. P&ID 1X4DB127, Waste Processing System - Liquid System

58. G2.1.1 001/3//COMMUNICATIONS/MEM 3.7/N/VG05301/R/MAB/RSB

Which ONE of the following concerning reactivity manipulations meets station expectations per NMP-OS-001, Reactivity Management Program?

- A. When making a routine boration for temperature control at BOL conditions, the manipulation must be peer checked by another licensed operator. The SS does not need to approve the manipulation if it was covered in the pre-shift reactivity briefing.
- B✓ When making a routine dilution for temperature control, another licensed operator shall peer check the manipulation. The SS must approve the manipulation even if it was covered in the pre-shift reactivity briefing.
- C. When responding to a turbine runback the RO shall have a peer check from another licensed operator prior to inserting control rods to keep Tave matched with Tref. SS approval is not required for these conditions.
- D. When responding to a loss of feedwater heating at 100% power, the BOP shall get approval from the SS prior to lowering power. Peer check from another licensed operator is not required for these conditions.

K/A

G2.1.1

Knowledge of conduct of operations requirements.

K/A MATCH ANALYSIS

Administrative reactivity management requirements being tested.

ANSWER / DISTRACTOR ANALYSIS

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

Distractors are plausible because of the memory-level nature of the question.

REFERENCES

1. NMP-OS-001, Reactivity Management Program, Section 6.4.

59. G2.1.23 001/3//AOP ENTRY CONDITION/MEM 3.9/N/VG05301/R/MAB/RSB

Which ONE of the following correctly states symptoms, as listed in the procedure, for entry into Section "A" of Loss of Class 1E 125 V DC Power, 18034-1, for loss of train "A" power?

- A✓ Loss of indicating lights on switchgear breakers for 1AA02, 1AB04, 1AB05, 1AB15. Loss of power to 1AY1A and 1AY2A. Train A Main Steam Line Isolation.
- B. Loss of indicating lights on equipment powered by Motor Control Centers (MCCs) 1ABA through 1ABF. Loss of power to 1AY1A and 1AY2A. Train A Main Steam Line Isolation.
- C. Loss of power to 1AY1A. TDAFW pump loss of control and indication. Emergency DG-1A fails to start. Train A Main Feed Line Isolation.
- D. Trip of the normal and alternate incoming breakers for switchgear 1AA02. Train A Main Feed Line Isolation. 125V DC Vital Bus 1AD1 voltage low. Train A Main Steam Line Isolation.

K/A

G2.1.23

Ability to perform specific system and plant procedures during all modes of plant operation.

K/A MATCH ANALYSIS

Question tests AOP entry condition knowledge, which is necessary knowledge for performing plant procedures in an abnormal mode of operation.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. See Page 2 of reference.
- B. Incorrect. See Page 2 of reference. Plausible because all the conditions are correct except for the loss of control power to the "A" Trn MCCs. Control power for the MCCs comes from their own 480V power supply.
- C. Incorrect. See Page 2 of reference. Plausible because 1AT1A, EDG-1A, and the Train "A" Main Feed Line Iso are all powered from 1AD1. The TDAFWP control power is powered from the train "C" 125 VDC. The TDAFW loop 1 steam supply valve (HV-3009) is powered from Train "A" 125 VDC.
- D. Incorrect. See Page 2 of reference. Plausible since Train "A" MFW Iso, 1AD1 voltage and MSLI are all powered from train "A" 125 V DC. Incorrect because the incoming bkrs to switchgear 1AA02 are powered from 125 VDC Train "A" power, but they will not trip. Since they have lost power, they will be unable to process any protective trips.

REFERENCES

1. 18034-C, Loss of Class 1E 125V DC Power, Rev. 7.1, 11/03/2003.

60. G2.1.7 001/3//OTDT RTD NR TEMP/C/A 3.7/B/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- Reactor is at 100% Rated Thermal Power.
- Loop 1 NR temperature loop failure has resulted in the OTDT trip setpoint to be 92%.
- Control rods have been placed in manual.
- The DELTA T DEFEAT SWITCH has been selected to defeat the failed channel.
- The Tavg DEFEAT SWITCH has been selected to defeat the failed channel.

If no other actions were taken, which ONE of the following correctly states the plant status and/or required operator actions?

- A✓ If another loop OTDT trip setpoint is subsequently exceeded, then the operators are to ensure the reactor automatically trips.
- B. Loop 1 has been removed from the OTDT protection circuit. Two more loops must exceed the OTDT setpoint for a reactor trip to occur.
- C. The turbine should have already undergone a runback. The BOP is required to manually runback the turbine.
- D. The reactor should have already tripped on OTDT. The RO is required to immediately trip the reactor.

K/A

G2.1.7

Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

K/A MATCH ANALYSIS

The applicant must make operational judgements based on plant configuration and instrument interpretation to determine the required operator/plant response.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. OTDT is essentially in 1/3 logic because the protective circuit is not bypassed by the actions stated in the stem.
- B. Incorrect. Not in a 2/3 logic (I.E. loop is not bypassed). Plausible because loop can be removed from control, but not protective, circuits.
- C. Incorrect. Runback occurs on 2/4 within 3% of trip setpoint. Plausible because applicant may not understand or correctly remember runback logic.
- D. Incorrect. Loop only feeds one fourth of logic required for trip. Plausible because applicant may not understand or correctly remember trip logic.

REFERENCES

- 1. V-LO-TX-28101, Reactor Protection System, Rev. 3.
- 2. V-LO-TX-16001, Reactor Coolant System, Rev. 3.0.
- 3. Vogtle Exam Bank Question LO-LP-16101-16-06

61. G2.2.13 001/3/TAGGING CHECK VALVE/MEM 3.6/N/VG05301/R/MAB/RSB

Which ONE of the following correctly states the proper method for positioning a fail open air operated valve (AOV), with a handwheel, to be used as a fluid boundary per NMP-AD-003, Equipment Clearance and Tagging, as part of the tagging process?

- A. Local and/or remote control switches must be in the "Closed" position. The air supply valve must be closed with air vented off of the operator. The handwheel must be in the closed position.
- B. Local and/or remote control switches must be in the "Closed" position. The air supply valve must be closed with air vented off of the valve operator. The handwheel does not need to be in the closed position.
- C✓ Local and/or remote control switches must be in the closed position. The handwheel must be in the closed position. The air supply is not required to be isolated and vented.
- D. Local and/or remote control switches must be in the "Closed" position. The valve must be mechanically or hydraulically (as appropriate) gagged in the closed position.

K/A

G2.2.13

Knowledge of tagging and clearance procedures.

K/A MATCH ANALYSIS

Question tests knowledge of info found on page 56 of Tagging procedure.

ANSWER / DISTRACTOR ANALYSIS

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

Incorrect answers are all plausible due to the fact that they meet requirements for different AOV types in the NMP.

REFERENCES

1. NMP-AD-003, Equipment Clearance and Tagging, Version 3.0, Page 57 of 66, 07/13/2004.

62. G2.2.24 001/3//TECH SPEC SPRAY/C/A 2.6/N/VG05301/R/MAB/RSB

Which ONE of the following maintenance activities, if conducted, would result in entry into a technical specification LCO action statement (assume each case separately and that all other equipment is operable and in its normal configuration for the stated plant conditions)?

- A. RCS temperature is 425 °F and Maintenance wants to replace the Train "A" Containment Spray Pump bearing.
- B. The unit is at 100% rated thermal power and steam generator #2 ARV needs to be repaired to stop seat leakage.
- C. The unit is at 100% rated thermal power and Maintenance needs you to de-energize the Standby Auxiliary Transformer (SAT) for inspection of electrical bushings.
- D. RCS temperature is 190 °F and CCP-1A motor bearing needs replacement.

K/A

G2.2.24

Ability to analyze the affect of maintenance activities on LCO status.

K/A MATCH ANALYSIS

The proposed maintenance activity in the answer affects a TS LCO.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. LCO 3.6.6 is applicable above 200 F and requires both CS pumps to be operable.
- B. Incorrect. Plausible because this equipment is required under LCO 3.7.4 except only 3 ARVs are required to be operable.
- C. Incorrect. Plausible since the SAT may be used for approved off-site AC sources, but is normally not aligned as a required power source.
- D. Incorrect. Plausible since the CCPs are part of the ECCS system and they are also required under the technical requirements manual (TRM) in mode 5.

REFERENCES

- 1. TS LCO 3.6.6, Containment Spray and Cooling Systems.
- 2. TS LCO 3.7.4, Atmospheric Relief Valves (ARVs).
- 3. TS LCO 3.8.1, AC Sources - Operating.
- 4. TS LCO 3.5.3, ECCS - Shutdown.

63. G2.2.28 001/3//REFUELING/MEM 2.6/N/VG05301/R/MAB/RSB

During refueling activities the duties and responsibilities of the Reactor Operator, in accordance with 93300-C, Conduct of Refueling Operations, include all of the following EXCEPT:

- A. Shall be stationed in the control room during all fuel movement, and during control rod latching and unlatching.
- B. Directs disengagement of fuel assemblies in the core after determining stable count rate on nuclear instrumentation.
- C. Monitors nuclear instrumentation during control rod latching and unlatching activities.
- D. Initiates cavity water level surveillance whenever the reactor cavity is flooded.

K/A

G2.2.28

Knowledge of new and spent fuel movement procedures.

K/A MATCH ANALYSIS

Question tests knowledge of a precaution/limitation associated with a fuel handling procedure.

ANSWER / DISTRACTOR ANALYSIS

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

All distractors are plausible due to the memory/recall nature of the question.

REFERENCES

1. 93300-C, Conduct of Refueling Operations, Rev. 21, Page 3, 09/24/2003.

64. G2.3.1 001/3//DOSE LIMITS/C/A 2.6/N/VG05301/R/MAB/RSB

An operator began work at Vogtle in May 2004. The current date is May 2005. The operator has the following dose history (TEDE):

- Year 2004 = 3000 mrem
- Year 2005 = 1427 mrem (Accumulated through May 2005)

The worker is directed to perform a job with an estimated dose of 1156 mrem.

Which ONE of the following correctly states the required approval, if any, needed prior to beginning the work?

- A. Vice President
- B. HP/C Manager
- C. NRC
- D✓ No approval needed

K/A

G2.3.1

Knowledge of 10 CFR: 20 and related facility radiation control requirements.

K/A MATCH ANALYSIS

Question tests the knowledge of plant admin and 10 CFR 20 requirements and what level of approval is needed to perform the work. The applicant must know how to calculate his projected dose, he must know the Admin limits (4500 mrem) and must know that he is not projected to exceed the admin limit, thus not needing approval.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Plausible because if the applicant does not understand that the dose limits are on a calendar year, then this would be the correct answer because the limit of 4500 mrem would be exceeded when looking at the previous 12 months.
- B. Incorrect. Plausible because the HP/C manager is responsible for the conduct of HP.
- C. Incorrect. Plausible because if the applicant makes the assumption that it is a rolling 4 quarters, then NRC would be required to be notified for exceeding the 10 CFR 20 limits.
- D. Correct. This is less than 10 CFR 20 limits for TEDE for the calendar year, thus requiring no approval to perform the work.

REFERENCES

1. LO-LP-63920-C-08, Radiation Exposure Limits, Rev. 08, 12/14/2000.
2. 00920-C, Radiation Exposure Limits and Administrative Guidelines, Rev. 14, dated 01/22/2004.

65. G2.3.11 001/3//WASTE GAS RELEASE/MEM 2.7/N/VG05301/R/MAB/RSB

The #1 Gas Decay Tank on Unit 2 is being released in accordance with 13202-2, Gaseous Releases. After the release has been underway for 10 minutes, Flow Transmitter, A-FT-0014, fails low. Which ONE of the following correctly states the actions that are required by 13202-2?

- A. The release does not need to be terminated unless Waste Gas Processing System Effluent Monitor, A-RE-0014, becomes inoperable or its setpoint is exceeded.
- B. The release must be terminated. It may not be recommenced until A-FT-0014 is repaired.
- C. The release does not need to be terminated. It may continue provided release rates are manually calculated.
- D✓ The release must be terminated. It may be recommenced provided release rates are manually calculated.

K/A

G2.3.11

Ability to control radiation releases.

K/A MATCH ANALYSIS

Question tests ability to properly conduct a radioactive gas release to the environment. Memory level because it just requires recall of 13202-2, Step 2.2.3.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Release must be terminated. Plausible because it also needs to be terminated if the Rad monitor fails or comes into alarm.
- B. Incorrect. Release may be recommenced with manual calcs for release rate. Plausible because it is not unrealistic to think that an operable FT is required.
- C. Incorrect. Release must be terminated. Plausible because it may be restarted using manual calcs.
- D. Correct. Release must be terminated and it may be restarted using manual calcs of release rate. See 13202-2 Step 2.2.3 and 4.2.14 for confirmation of answer.

REFERENCES

1. 13202-2, Gaseous Releases, Rev. 8, 09/24/2003.

66. G2.4.12 001/3//IMMEDIATE ACTIONS/MEM 3.4/N/VG05301/R/MAB/RSB

19000-C, E-0 Reactor Trip or Safety Injection, has been entered upon a reactor trip.

Which ONE of the following correctly describes the required operator response with respect to performance of immediate operator actions following the reactor trip?

- A. The USS is required to state the entire step, including all substeps. The RO and BOP are required to repeat only the high level step.
- B. The USS is required to state the entire step, including all substeps. The RO and BOP are required to repeat the entire step, including all substeps.
- C✓ The USS is required to state the high level step. The RO and BOP are required to repeat the step, including all substeps.
- D. The RO and BOP are required to repeat only the high level step and be able to perform all substeps.

K/A

G2.4.12

Knowledge of general operating crew responsibilities during emergency operations.

K/A MATCH ANALYSIS

Part of crew responsibilities include correctly carrying out immediate operator actions. This question tests knowledge of the admin requirements for performing immediate actions during an EOP.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. USS not required to state substeps. RO/BOP required to repeat substeps.
- B. Incorrect. USS not required to state substeps.
- C. Correct. 10020-C, Section 3.4.
- D. Incorrect. Communication of substeps to USS is required.

Distractors are plausible because the question is memory-level. If applicants do not remember the requirements, then any one of the distractors could be a logical choice.

REFERENCES

1. 10020-C, EOP and AOP Rules of Usage, Rev. 2, 01/11/2004.

67. G2.4.4 001/3//FAULTED SG MSLB/C/A 4.0/M/VG05301/R/MAB/RSB

Unit 1 was at 100% rated thermal power with the following conditions:

- Chemistry confirmed a 7 gpd tube leak in Steam Generator #1.
- RE-12839C, SJAE Rad Monitor, alarm setpoint was adjusted.
- RE-0724, Main Steam N16 Monitor, was reading above background.
- Steam Generator #1 steam supply to the TDAFW Pump was isolated.
- 18009-C, Steam Generator Tube Leak, was entered, and remains in effect.
- Steam Generator #2 pressures are 800 psig and dropping rapidly.
- Containment pressure is 8 psig and rising rapidly.
- Containment sump levels are trending up.
- RCS subcooling is trending up.

The control room crew then enters 19000-C, E-0 Reactor Trip or Safety Injection, due to an automatic reactor trip and safety injection.

Which ONE of the following correctly describes the correct course of action?

- A✓ Transition from 19000-C to 19020-C, E-2 Faulted Steam Generator Isolation.
- B. Transition from 19000-C to 19030-C, E-3 Steam Generator Tube Rupture.
- C. Transition from 19000-C to 19010-C, E-1 Loss of Reactor or Secondary Coolant.
- D. Transition from 19000-C to 18004-C, Reactor Coolant System Leakage.

K/A

G2.4.4

Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

K/A MATCH ANALYSIS

Indications provided in the question can be used to determine what procedure to go to.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Faulted SG is correct procedure.
- B. Incorrect. A small amount of tube leakage does not require entry into SGTR. Plausible because there is SG tube leakage.
- C. Incorrect. Steam Generator pressure and RCS subcooling differentiates between a LOCA and faulted SG. Plausible because many parameters trend in same direction for either event.
- D. Incorrect. RCS subcooling and SG pressures indicate a faulted SG, not RCS leak. Plausible because many parameters trend in same direction for either event.

REFERENCES

- 1. 19030-C, E-3 Steam Generator Tube Rupture, Rev. 30, 04/02/2004.
- 2. 19000-C, E-0 Reactor Trip or Safety Injection, Rev. 29, 06/25/2004.
- 3. 19020-C, E-2 Faulted Steam Generator Isolation, Rev. 16.1, 07/30/2003.
- 4. 18004-C, Reactor Coolant System Leakage, Rev. 20, 04/21/2004.
- 5. Vogtle Exam Bank Question LO-LP-37121-06-02.

68. WE01G2.1.9 001/1/2/REDIAGNOSIS/MEM 2.5/B/VG05301/R/MAB/RSB

The SRO announces to the crew that 19005-C, Rediagnosis, must be entered.

Which ONE of the following conditions would require the RO to dispute this course of action (I.E. prevent entry into 19005-C)?

- A. Total ECCS flow is 2000 gpm.
- B. 19030-C, Steam Generator Tube Rupture, is in progress.
- C. Following a safety injection, a yellow path on "Inventory" is present at Step 1 of 19010-C, Loss of Reactor or Secondary Coolant, but the procedure reader has decided not to implement the FRP at this time.
- D. 19001-C, Reactor Trip Response, is in progress with pressurizer level at 20% and stable and RCS subcooling at 40 °F and stable.

K/A

WE01 Rediagnosis

G2.1.9 Ability to direct personnel activities inside the control room.

K/A MATCH ANALYSIS

In order to correctly direct control room activities, the operator must possess the knowledge of what procedure needs to be utilized. This question tests the entry conditions associated with Rediagnosis, which appear in a Note on Page 2 of the Rediagnosis procedure. ROs are required to know procedure entry conditions. Question is memory level because applicant only needs to memorize the Note on Page 2 of the Rediagnosis procedure.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. This is one of the entry conditions in 19005-C (ECCS in service).
- B. Incorrect. This is one of the entry conditions in 19005-C (Optimal Rec Proc).
- C. Incorrect. This is one of the entry conditions in 19005-C (Not Red or Orange Path).
- D. Correct. No Optimal Rec Proc has been entered and SI could not have been required if they are in Rx Trip Response.

REFERENCES

- 1. 19005-C, ES-0.0, Rediagnosis, Rev. 8.1, 11/17/1999.
- 2. Vogtle Exam Bank Question LO-LP-37002-12-02.

69. WF03EK3.3 001/1/2/LOCA COOL/DOWN DEPRES/MEM 3.9/B/VG05301/R/GWL/RSB

The following Unit 1 conditions exist:

- A Small Break LOCA has occurred
- A reactor trip and SI has occurred.
- Operators have entered 19012-C "Post-LOCA Cooldown and Depressurization."
- Cooldown to cold shutdown has commenced but depressurization to refill the pressurizer has not started.
- At Step 11 the operators are directed to "Check RCS subcooling based on CETCs greater than 24°F (38°F)."

Which ONE of the following describes the reason subcooling is checked to be above this value?

- A. To determine if RCPs must be stopped
- ☒ B. To determine if RCS depressurization can commence.
- C. To allow normal charging to be aligned
- D. To allow the SI signal to be reset

K/A

WE03 LOCA Cooldown - Depress.

EK3.3 Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization): Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.

K/A MATCH ANALYSIS

Question tests reasons for control manipulations during an emergency. A scenario is given to place the operator in the right frame of mind at a particular procedure step, but question is memory level because it is simple recall of the basis for an action.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect, Subcooling is checked to determine if RCPs can be started.
- B. Correct, Subcooling is checked to determine if the RCS can be depressurized.
- C. Incorrect, Subcooling for aligning normal charging is 31°F(46°F).
- D. Incorrect, The SI is reset at step 1 of this procedure and is not determined by subcooling.

REFERENCES

Vogtle Bank Question # LO-OR-37112-01 Need to obtain a Licensee Objective when the Lesson plans are received. VEGP 19012-C Rev 26.1 page 9 of 33.
WOG Background document Rev 1C page 109 Step Description for ES-1.2.

70. WE04EK1.1 001/1/1/1.LOCA OUTSIDE CONTAIN/MEM 3.5/B/VG05301/R/MAB/RSB

Which ONE of the following correctly states actions contained in 19112-C, ECA-1.2 LOCA Outside Containment, and reasons for those actions?

- A. Open HV-8802A (SI PMP-A TO HOT LEG 1 & 4 ISO VLV) to provide a flow path for Low Head Safety Injection. Then close HV-8809A (RHR PMP-A TO COLD LEG 1 & 2 ISO VLV) and monitor RCS pressure.
- B. Close HV-8809A (RHR PMP-A TO COLD LEG 1 & 2 ISO VLV). If this action does not result in an RCS pressure rise then allow the valve to remain closed because this will allow time for the operators to check Auxiliary Building alarms while the flow path is isolated.
- C. If the leak is not identified and isolated then transition to 19010-C, Loss of Reactor or Secondary Coolant, because RCS inventory will continue to be lost outside of containment.
- D✓ Close HV-8809A (RHR PMP-A TO COLD LEG 1 & 2 ISO VLV). If this action results in an RCS pressure rise then stop the 'A' RHR Pump.

K/A

WE04 LOCA Outside Containment

EK1.1 Knowledge of the operational implications of the following concepts as they apply to the (LOCA Outside Containment): Components, capacity, and function of emergency systems.

K/A MATCH ANALYSIS

The question tests operational implications of closing valves to identify the source of the leak. Therefore, the operational implications of components during a LOCA outside containment are being tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. No procedural direction is given to open HV8802A. Plausible because guidance does exist to close HV-8809A.
- B. Incorrect. If pressure does not rise when the valve is closed, then closing the valve did not isolate the leak and the procedure directs the valve to be re-opened. Plausible because guidance does exist to close HV-8809A.
- C. Incorrect. If the leak is not isolated, then the correct action would be to transition to ECA-1.1, Loss of Emergency Coolant Recirculation. Plausible because a LOCA does exist.
- D. Correct. 19112-C, Step 2.

REFERENCES

- 1. Surry 2004-301 Exam Question WE04EK3.2.
- 2. 19112-C, ECA-1.2, LOCA Outside Containment, Rev. 4.1, 11/22/2000.

71. WE08G2.4.20 001/1/2/PTS MSLB SG DEPRESS/MEM 3.3/N/VG05301/R/MAB/RSB

A depressurization of all steam generators is occurring and 19121-C, ECA-2.1 Uncontrolled Depressurization of All Steam Generators, has just been entered. The turbine driven auxiliary feedwater pump (TDAFWP) is the only source of feedwater available to feed the steam generators.

Per the CAUTION statements of 19121-C, which ONE of the following meets the required actions associated with the TDAFW Pump?

- A. Shut HV-3009 (LP-1 MS SPLY TO AUX FW TD PMP-1) and HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1).
- B✓ Shut HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1) and maintain 30 gpm of auxiliary feed flow to each steam generator.
- C. Do not shut HV-3009 (LP-1 MS SPLY TO AUX FW TD PMP-1) or HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1), and maintain 60 gpm of auxiliary feed flow to only one steam generator.
- D. Do not shut HV-3009 (LP-1 MS SPLY TO AUX FW TD PMP-1) or HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1) and maintain 60 gpm of auxiliary feed flow to each steam generator.

K/A

WE08 RCS Overcooling - PTS

G2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.

K/A MATCH ANALYSIS

ECA-2.1 is used in a condition where a rapid cooldown of the RCS occurs with the potential to repressurize. In this condition it is important to maintain a heat sink and avoid SG dryout. PTS mitigation strategies include limiting the cooldown and RCS soak, both of which are linked to the caution statements. (FR-P.1, Response to Pressurized Thermal Shock Condition, also contains the same guidance as is found in ECA-2.1.) The question is memory level because it only requires the knowledge of the caution statements.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. See Cautions in ECA-2.1 and FR-P.1. Plausible because feeding SGs when they are blowing down would provide more inventory to further blow down the SG.
- B. Correct. The Caution in ECA-2.1 (Page 2 of 34) requires that if the TDAFWP is the only source of feed, then the steam supply to the TDAFWP should be maintained from one SG. Notice that this Caution is slightly different than the Caution in FR-P.1, which requires maintaining steam to the TDAFWP from at least one SG.
- C. Incorrect. Caution in ECA-2.1 (Page 5 of 34) requires feed flow be maintained to all SG at 30 gpm to prevent SG dryout. Plausible because maintaining both valves open is in agreement with the caution in FR-P.1.
- D. Incorrect. Same as "C" above.

REFERENCES

- 1. LO-LP-37071-04, Pressurized Thermal Shock, Rev. 4, 03/17/1999.
- 2. 19121-C, ECA-2.1, Uncontrolled Depressurization of All Steam Generators, Rev. 23.1.
- 3. 19241-C, FR-P.1, Response to Imminent Pressurized Thermal Shock Condition, Rev. 20.

72. WE09EK2.2 001/1/2/NC NATURAL CIRC ARV/C/A 3.6/N/VG05301/R/MAB/RSB

Unit 1 has just tripped and operators are performing E-0, Reactor Trip or Safety Injection, Step 21, "VERIFY RCS temperatures," with the following conditions.

- RCS cold leg temperatures are 560 °F and rising
- Condenser vacuum is 27.00 inches of Hg and lowering
- Power supply 1AY1A is de-energized
- Busses 1NAA and 1NAB are de-energized

Which ONE of the following correctly states the required operator action?

- A. With steam dumps in steam pressure mode, turn the PIC-507 potentiometer counter-clockwise.
- B. With steam dumps in steam pressure mode, turn the PIC-507 potentiometer clockwise.
- C. With SG #1 (PV-3000A) and SG #4 (PV-3030A) in manual mode, depress the manual up arrow to dump steam.
- D. With SG #2 (PV-3010A) and SG #3 (PV-3020A) in manual mode, depress the manual up arrow to dump steam.

K/A

WE09 Natural Circ.

EK2.2 Knowledge of the interrelations between the (Natural Circulation Operations) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

K/A MATCH ANALYSIS

Operation of the SG as a heat sink in order to enhance NC is being tested. Applicant has adequate info to decipher that RCPs are not operating due to loss of busses. Adequate memory level info is given for applicant to decipher that steam dumps are not available and specific power supply information wrt ARVs is not needed (applicant only needs to know which electrical train).

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. No Condensate pumps running - no C-9 interlock for condenser - no stm dumps. Plausible because if applicant does not know that condensate pumps are supplied by the two busses that tripped, then applicant may think this choice is correct.
- B. Incorrect. See "A" above, except potentiometer direction is also wrong.
- C. Incorrect. ARV-3000A and 3030A not available with loss of 1AY1A. Plausible because ARVs are required to dump steam with current plant conditions.
- D. Correct. No condensate pumps are operating, thus the condenser is not available for stm dumps, which requires the use of ARVs with a rising cold leg temp above 557 F. ARV-3010A and 3020A still have power and depressing the UP arrow will open the ARVs.

REFERENCES

- 1. P&ID, 1X3D-AA-C01A, Rev. 20, 13800 v Switchgear 1NAA.
- 2. P&ID, 1X3D-AA-C02A, Rev. 11, 13800 v Switchgear 1NAB.
- 3. V-LO-TX-07101, Circulating Water, Rev. 2.
- 4. V-LO-TX-21101, Main Steam, Rev. 4.0.
- 5. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3.
- 6. 19000-C, E-0 Reactor Trip or Safety Injection, Rev. 29.

73. WE11EK2.2 001/1/1/LOSS OF RECIRC/C/A 3.9/B/VG05301/R/MAB/RSB

The following Unit 1 conditions exist:

- A primary LOCA outside containment is in progress
- The reactor was tripped and Safety Injection was manually actuated
- 19112-C, ECA-1.2 LOCA Outside Containment, has been completed
- The crew was unable to isolate the leak and they have transitioned to 19111-C, ECA-1.1 Loss of Emergency Coolant Recirculation.

Which ONE of the following choices describes the correct actions to take in 19111-C under these conditions?

- A. Start makeup to the RWST from the boric acid system, shift Containment Cooling Units to fast speed, and initiate RCS cooldown.
- B. Initiate RCS cooldown, establish one train of ECCS flow to maintain subcooling greater than 74 °F, and start makeup to the RWST from the Spent Fuel Pool.
- C. Initiate RCS cooldown, establish one train of ECCS flow to maintain subcooling greater than 74 °F, and start makeup to the RWST from the boric acid system.
- D✓ Start makeup to the RWST from the Spent Fuel Pool, initiate RCS cooldown, and minimize ECCS flow to keep RVLIS full range > 62%.

K/A

WE11 Loss of Emergency Coolant Recirc.

EK2.2 Knowledge of the interrelations between the (Loss of Emergency Coolant Recirculation) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

K/A MATCH ANALYSIS

The RWST is providing inventory for heat removal and is relied upon for a longer period of time when emergency coolant recirculation is not available. The question tests knowledge that is required to keep the core covered and maintain a cooling medium for the fuel.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Containment cooling fans are to be verified in slow speed (19111-C, Step 3). Plausible because the other items are correct.
- B. Incorrect. Maintaining subcooling greater than 74 °F is contradictory to Major Actions (19111-C, Page 1). Plausible because the other items are correct.
- C. Incorrect. Maintaining subcooling greater than 74 °F is contradictory to Major Actions (19111-C, Page 1). Plausible because the other items are correct.
- D. Correct. See 19111-C, Page 1, Step 7, Step 9, Step 20

REFERENCES

- 1. 19111-C, Loss of Emergency Coolant Recirculation, Rev. 24.1, 09/18/2002.
- 2. 19112-C, ECA-1.2 LOCA Outside Containment, Rev. 4.1, 11/22/2000.
- 3. Vogtle Bank Question LO-LP-37112-01-08.

74. WE12G2.1.8 001/1/1/UNCONTROLLED DEPRESS/MEM 3.8/N/VG05301/R/MAB/RSB

Operators have entered 19121-C, ECA-2.1 Uncontrolled Depressurization of All Steam Generators, for Unit 2. While checking steam generator pressure boundaries, the reactor operator noted that Main Feed Isolation Valves (MFIVs) were not closed and could not be closed from the Main Control Room. Main Steam Isolation Valves and Main Feed Regulating Valves were verified to be shut.

Which ONE of the following correctly describes the mitigating actions in accordance with ECA-2.1 that are required to be taken by the operators faced with the open Main Feed Isolation Valves?

- A. Dispatch an operator to take local control of the MFIVs and stroke them shut.
- B✓ Dispatch an operator to momentarily open breakers 2AD12-08 and 2BD12-08.
- C. Dispatch an operator to locally isolate the air supply to the hydraulic pump on the MFIVs.
- D. Allow the valves to remain open because the Main Feed Regulating Valves and Main Feed Regulating Bypass Valves are closed.

K/A

WE12 Uncontrolled Depressurization of all Steam Generators

G2.1.8 Ability to coordinate personnel activities outside the control room.

K/A MATCH ANALYSIS

The question tests local actions that must be performed during an uncontrolled depress of all SGs. The control room staff must have knowledge of the local actions that are required to be performed in order to have the ability to coordinate the activities.

Therefore, the K/A is met because the question tests knowledge that is required in order to have the ability to coordinate activities outside the control room during an uncontrolled depress of all SGs.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. See 19121-C, Step 1. Plausible because this is a logical alternative to most valves when they will not operate by normal means from the control room.
- B. Correct. See 19121-C, Step 1.
- C. Incorrect. See 19121-C, Step 1 - brks are to be momentarily opened. Plausible because the hydraulic pump needs air to maintain valves in open position.
- D. Incorrect. See 19121-C, Step 1. Plausible because MFRVs are closed, but procedure still requires that MFRVs be closed.

REFERENCES

1. 19121-C, ECA-2.1 Uncontrolled Depressurization of All Steam Generators, Rev. 23.1, 11/12/2002.

75. WE16EK2.1 001/1/2/CONTAINMENT RADIATIO/MEM 3.0/B/VG05301/R/MAB/RSB

Which ONE of the following correctly describes the automatic actions that occur with respect to a Containment Ventilation Isolation (CVI) signal resulting from a high radiation condition in containment?

- A✓ Containment purge and containment atmosphere sample lines are isolated.
- B. Containment purge is isolated and electrical penetration area filtration and exhaust system receives a stop signal.
- C. Containment atmosphere sample lines are isolated and the piping penetration area filtration and exhaust system receives a stop signal.
- D. The electrical penetration area and the piping penetration area filtration and exhaust systems receive a stop signal.

K/A

WE16 Containment Radiation

EK2.1 Knowledge of the interrelations between the (High Containment Radiation) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

K/A MATCH ANALYSIS

Question tests knowledge associated with the control functions associated with CVI.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. See reference.
- B. Incorrect. Elec Pen Room filtration and exhaust not affected by CVI. Plausible because it is partially correct.
- C. Incorrect. Pipe Pen Room filtration and exhaust not affected by CVI. Plausible because it is partially correct.
- D. Incorrect. See "B" and "C" above. Plausible because both rooms are adjacent to containment.

REFERENCES

1. Vogtle ILT Exam Bank, LO-LP-23202-01-03. Used as basis for question.
2. V-LO-TX-32101, Digital Radiation Monitoring System, Rev. 0.

76. 005A2.04 001/2/1/RHR VALVE MALFUNCTION/C/A 2.9/N/VG05301/S/MAB/RSB

The following Unit 1 conditions exist:

- The reactor cavity is flooded with the transfer canal open and fuel in the vessel
- The 'A' RHR pump is operating
- The 'B' RHR pump is out of service due to a breaker malfunction
- The Train 'A' Residual Heat Exchanger Outlet Valve has closed and will not re-open
- No RCS leakage is present
- 18019-C, Loss of Residual Heat Removal, has been entered.

Which ONE of the following correctly describes the actions that must be taken in accordance with 18019-C?

- A. Implement 91001-C, Emergency Classification and Implementing Instructions.
Shift CCP Suction to the RWST.
Place SFP Purification in service and transfer water from the SFP to the RWST.
- B. Implement 91001-C, Emergency Classification and Implementing Instructions.
Ensure open RHR Train to Hot Leg Crossover Iso Valves (HV-8716A/B).
Ensure RCS temperature remains less than 200 °F.
- C. Stop the 'A' RHR Pump and declare the 'A' RHR Train Inoperable.
Ensure open RHR Train to Hot Leg Crossover Iso Valves (HV-8716A/B).
Initiate actions to establish containment closure.
- D. Stop the 'A' RHR Pump and declare the 'A' RHR Train Inoperable.
Start available containment cooling fans in low speed.
Ensure open HV-8804A, SIP/CCP Suction Header Discharge.

K/A

005 Residual Heat Removal

A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR valve malfunction.

K/A MATCH ANALYSIS

The HX outlet valve has malfunctioned and the Loss of RHR procedure needs to be used to mitigate the problem. The question is SRO level because the E-Plan must be entered.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Section C (begins on Page 31) of 18019-C provides guidance to enter the E-Plan procedure, shift CCP suction to RWST, align SFP purification, and xfer water from SFP to RWST.
- B. Incorrect. No guidance exists for opening HV-8716A/B and they tap off downstream of the HX outlet. Plausible because these valves do cross-connect the two trains and can be operated from the CR.
- C. Incorrect. See B analysis above.
- D. Incorrect. No guidance exists for opening HV-8804A and it also taps off downstream of the HX. Plausible applicant may think this to be a viable flowpath to circulate water through the RHR HX.

REFERENCES

- 1. 18019-C, Loss of Residual Heat Removal, Rev. 24, 09/17/2003.
- 2. P&ID, 1X4DB122, Residual Heat Removal, Rev. 47.

77. 005AA2.03 001/1/2/STUCK CONTROL ROD/C/A 4.4/N/VG05301/S/MAB/RSB

The following Unit 1 conditions exist:

- Reactor power is 75% following a power reduction.
- During rod insertion the crew observed that three control rods failed to insert with the rest of their group and are now 14 steps further withdrawn than the group step counter demand position.
- Troubleshooting revealed the following:
 - All three control rods will not move via operation of the control rod drive system.
 - A verification has not yet been made to determine if a rod control system failure is preventing rod motion.
- The crew has verified shutdown margin to be 1.85 % delta-k / k.

Which ONE of the following correctly describes additional actions, if any, that are required by Technical Specifications and the basis for those actions?

- A✓ Reduce thermal power to place the plant in Mode 3 because the conditions are outside of the Safety Analysis assumptions.
- B. Verify $F_Q(z)$ is within its steady state limit and initiate boration to restore shutdown margin within the limits of the COLR.
- C. Reevaluate the Safety Analysis to confirm that the results remain valid for the duration of operation under these conditions and initiate boration to restore shutdown margin within the limits of the COLR.
- D. No additional actions are required because the stated plant conditions are bounded by the Safety Analysis.

K/A

005 Inoperable/Stuck Control Rod

AA2.03 Ability to determine and interpret the following as they apply to the Inoperable / Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.

K/A MATCH ANALYSIS

The stem describes a situation where three rods are immovable and inoperable. The question then tests the actions that are required by tech specs based on more than one rod being inoperable, therefore, the question is testing the knowledge required by the K/A. The question is SRO-only knowledge because it is asking about actions and the reasons for those actions. The question is closed reference because SROs are required to know the bases behind the Tech Specs. The question is also closed book because the completion time knowledge is not being tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Power must be reduced because the plant must be taken to Mode 3 based on inoperability of the control rods (LCO 3.1.4 Action A.2 and D.2).
- B. Incorrect. SDM is already met, therefore boration is not required. Plausible because boration would be required if SDM were not met. Also, verification of $F_Q(z)$ is required for one misaligned rod.
- C. Incorrect. SDM is already met, therefore boration is not required. Plausible because boration would be required if SDM were not met. Also plausible because reevaluation of the Safety Analysis is required for one misaligned rod.
- D. Incorrect. Actions stated above are required. Plausible because SDM requirements are met.

REFERENCES

- 1. Technical Specification LCO 3.1.4, Rod Group Alignment.
- 2. Technical Specification LCO 3.1.4 Basis.
- 3. Technical Specification LCO 3.2.1, Heat Flux Hot Channel Factor.
- 4. Core Operating Limits Report, Unit 1, Cycle 12.

78. 008AA2.22 001/1/1/RCP VAPOR SPACE LOCA/C/A 4.2/N/VG05301/S/MAB/RSB

The following conditions exist on Unit 1:

- A reactor trip and safety injection have occurred.
- Pressurizer pressure is 1300 psig and lowering.
- Pressurizer Code Safety Temperature Indicator, TI-0466, is rising.
- PRT level, temperature, and pressure are rising.
- All safety equipment has functioned as expected.

The operating crew has just entered 19010-C, E-1 Loss of Reactor or Secondary Coolant.

Which ONE of the following correctly states procedurally directed requirements for RCP operation and the reasons for the requirements?

- A. Secure RCPs to reduce pressure in the vessel due to pressurized thermal shock concerns.
- B✓ Secure RCPs due to peak clad temperature concerns.
- C. Do not secure RCPs because securing the pumps may raise the fuel rod peak clad temperature.
- D. Do not secure the RCPs because securing the pumps may worsen the voiding in the reactor vessel head.

K/A

008 Pressurizer Vapor Space Accident

AA2.09 Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Consequences of loss of pressure in RCS; methods for evaluating pressure loss.

K/A MATCH ANALYSIS

The stem provides indications for verifying the method of pressure loss is in the vapor space of the pressurizer. The question tests the consequences of this pressure loss - RCP tripping. Question is SRO level because it tests the reasons for securing RCPs.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. RCPs are not secured to reduce pressure.
- B. Correct. Pumps must be secured iaw E-1 Step 1. Per referenced lesson plan, pumps are secured because PCT may be higher if pumps are secured at lower pressures.
- C. Incorrect. Pumps must be secured iaw E-1 Step 1. Plausible because there is no break in the hot or cold legs when you may have an inventory loss concern in those areas. An applicant may think that it would make sense to keep the pumps running when the break is located in the upper portions of the system.
- D. Incorrect. Pumps must be secured iaw E-1 Step 1. Plausible for same reasons as 'C' above. In addition, head voiding is a concern, and keeping the RCPs running would likely lessen the voiding.

REFERENCES

1. 19010, E-1 Loss of Reactor or Secondary Coolant, Rev. 28.2, 09/27/2002.
2. LO-LP-37111, Operator Response To Loss Primary Coolant, Rev. 15, 08/29/2000.

79. 010G2.2.22 001/2/1/SAFETY LIMIT/MEM 4.1/N/VG05301/S/MAB/RSB

The following Unit 1 conditions exist:

- Pressurizer pressure is 2750 psig.
- Plant is in Mode 3.

Which ONE of the following correctly states the required Technical Specification action and its basis?

- A. Restore pressurizer pressure within 1 hour because reactor coolant pressure boundary design conditions will not be exceeded since credit is taken in the Technical Specification Bases for pressurizer power operated relief valve automatic operation.
- B. Restore pressurizer pressure within 1 hour because reactor coolant pressure boundary design conditions are not to be exceeded during normal operation and anticipated operational occurrences (AOOs).
- C. Restore pressurizer pressure within 5 minutes because reactor coolant pressure boundary design conditions will not be exceeded since credit is taken in the Technical Specification Bases for pressurizer power operated relief valve automatic operation.
- D✓ Restore pressurizer pressure within 5 minutes because reactor coolant pressure boundary design conditions are not to be exceeded during normal operation and anticipated operational occurrences (AOOs).

K/A

010 Pressurizer Pressure Control

G2.2.22 Knowledge of limiting conditions for operations and safety limits.

K/A MATCH ANALYSIS

The question tests knowledge related to the TS required actions associated with controlling pressure below the Safety Limit. The question is SRO-only knowledge because the TS Basis must be known in order to correctly answer the question.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Restore P w/i 5 min, not 1 hour. Plausible because 1 hour is correct if in Mode 1 or 2.
- B. Incorrect. Restore P w/i 5 min, not 1 hour. Plausible because 1 hour is correct if in Mode 1 or 2.
- C. Incorrect. PORVs are not credited in the Tech Spec Basis.
- D. Correct. See TS Basis Page B2.1.2-1 and TS Section 2.0.

REFERENCES

- 1. Technical Specification Section 2.0, Safety Limits (SLs).
- 2. Technical Specification Basis Section 2.0, SLs.

80. 011EA2.08 001/1/1/HOT LEG RECIRC/C/A 3.9/M/VG05301/S/MAB/RSB

The plant staff is recovering from a large break loss of coolant accident that occurred 5 hours ago. The break is thought to be on one of the cold legs. The control room staff is evaluating conditions for entry into 19014-C, ES-1.4 Transfer to Hot Leg Recirculation, in accordance with 19010-C, E-1 Loss of Reactor or Secondary Coolant. Plant conditions appear to be stable as the TSC and operating crew are making their evaluations of long term mitigation strategies.

Which ONE of the following correctly describes conditions needed to go to hot leg recirculation and the reason?

- A. Enter 19014-C in 1.5 hours to flush high concentration boric acid in the reactor vessel out the break and back to the sump.
- B✓ Enter 19014-C in 2.5 hours to flush high concentration boric acid in the reactor vessel out the break and back to the sump.
- C. Enter 19014-C in 1.5 hours to refill the reactor vessel and downcomer.
- D. Enter 19014-C in 2.5 hours to refill the reactor vessel and downcomer.

K/A

011 Large Break LOCA

EA2.08 Ability to determine or interpret the following as they apply to a Large Break LOCA: Conditions necessary for recovery when accident reaches stable conditions.

K/A MATCH ANALYSIS

The plant is stable, several hours after a LBLOCA. The crew has a condition on time that they must meet in order to go to HL Recirc. The question is SRO level because the reason for performing the step is also tested.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. E-1 states that HL recirc is to be conducted at 7.5 hours after the accident. The accident occurred 5 hours ago, so $5 + 1.5$ is only 6.5 hours after the accident. Plausible because E-1, Step 20 states that the crew should prepare for HL Recirc at 6.5 hours after accident.
- B. Correct. $5 \text{ hours} + 2.5 \text{ hours} = 7.5 \text{ hours}$ (E-1, Step 21). LO-LP-37114-14, Page 4, provides the correct reason.
- C. Incorrect. E-1 states that HL recirc is to be conducted at 7.5 hours after the accident. The accident occurred 5 hours ago, so $5 + 1.5$ is only 6.5 hours after the accident. Plausible because water is helping to refill the vessel.
- D. Incorrect. Boron plate-out is correct, not filling the downcomer (which is on the cold leg side). Plausible because water is helping to refill the vessel.

REFERENCES

- 1. Farley 1995 Exam Question 009K3.21.
- 2. LO-LP-37114-14, Transfer To Hot Leg Recirculation, and Loss of Emergency Coolant Recirculation, Rev. 14, 11/08/2000 (OBJ #9).
- 3. 19010-C, E-1 Loss of Reactor or Secondary Coolant, Rev. 28.2.

81. 016A2.03 001/2/2/PRESSURIZER LEVEL/C/A 3.3/N/VG05301/S/MAB/RSB

Pressurizer Water Level Indicator, LI-459A, becomes inoperable due to a signal interruption from the level transmitter (LT-459). No operator actions have been taken to address the failure.

Which ONE of the following correctly states the Reactor Trip System (RTS) Instrumentation operability requirements in accordance with Technical Specifications and the basis?

- A. LCO 3.3.1 RTS Instrumentation is met because only two channels are required to be operable for the Reactor Trip System Instrumentation. The system is designed so that with the slow rate of charging available, pressure overshoot due to pressurizer level channel failure will cause the safety valve to lift before the reactor high pressure trip.
- B. LCO 3.3.1 RTS Instrumentation is met because only two channels are required to be operable for the Reactor Trip System Instrumentation. The system is designed to prevent water relief through the pressurizer safety valves.
- C. LCO 3.3.1 RTS Instrumentation is not met because three channels are required to be operable for the RTS Instrumentation. The system is designed so that with the slow rate of charging available, pressure overshoot due to pressurizer level channel failure will cause the safety valve to lift before the reactor high pressure trip.
- D. LCO 3.3.1 RTS Instrumentation is not met because three channels are required to be operable for the RTS Instrumentation. The system is designed to prevent water relief through the pressurizer safety valves.

K/A

016 Non-nuclear Instrumentation

A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.

K/A MATCH ANALYSIS

The pwr level instrumentation is NNI. The impacts of one channel being inoperable are that the TS LCO is not met for RTS Instrumentation. Knowing that the LCO is not met is the first step in applying TS in order to maintain the plant within its design basis. Therefore the question is testing knowledge necessary to mitigate the consequences of having the channel inoperable. The question is SRO level because it requires basis knowledge in order to arrive at the correct answer.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Three channels are required to be operable. Plausible because only two channels are required to be operable for PAM Instrumentation.
- B. Incorrect. Three channels are required to be operable. Plausible because only two channels are required to be operable for PAM Instrumentation.
- C. Incorrect. System is designed so that safety valves cannot lift before reactor trip. Plausible because three channels are required to be operable.
- D. Correct. See TS 3.3.1 and its Basis.

REFERENCES

- 1. Technical Specification 3.3.1, Reactor Trip System Instrumentation.
- 2. Technical Specification 3.3.1 Basis.
- 3. Technical Specification 3.3.3, Post Accident Monitoring (PAM) Instrumentation.
- 4. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3.

82. 022G2.1.12 001/1/1/TS ECCS TECH SPEC/C/A 4.0/N/VG05301/S/MAB/RSB

The following Unit 1 conditions exist:

- Tavg = 300 °F
- Both CCPs have been declared inoperable due to a common cause

Which ONE of the following correctly states the required actions in accordance with Technical Specifications and the basis for the actions?

- A✓ Restore a CCP to operable status within 1 hour because the plant is not prepared to provide a high pressure response to Design Basis Events requiring Safety Injection.
- B. Restore a CCP to operable status within 72 hours because at least 100% of ECCS flow equivalent to a single OPERABLE ECCS train is available.
- C. Restore a CCP to operable status within 1 hour to regain protection from a single failure disabling the ECCS.
- D. Enter LCO 3.0.3 due to no ECCS trains being operable to provide a high pressure response to Design Basis Events requiring Safety Injection.

K/A

022 Loss of Rx Coolant Makeup

G2.1.12 Ability to apply technical specifications for a system.

K/A MATCH ANALYSIS

The High Pressure SI, provided by the CCPs, falls into the category of Inventory Control. Therefore, RCS makeup is encompassed. The question tests Technical Specifications, which completes the K/A match. The question tests TS Basis knowledge, which makes it SRO level and it concerns a 1 hour Action Statement, which makes it required closed-book knowledge.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Restoring a CCP to OPERABLE would allow the action statement to be completed. The reason given is taken out of the TS Basis Document.
- B. Incorrect. 72 hours would only be applicable if 100% of ECCS flow were available. Plausible because 72 hours would be the case if 100% of ECCS flow were available.
- C. Incorrect. Single failure criteria does not apply, per the TS Basis. Restoring a CCP would not place the plant in a situation where they would be single-failure proof. A single failure could still eliminate all high head SI. Plausible because single failure criteria applies in most other conditions where TS are used.
- D. Incorrect. The TS cover the current situation. Plausible because no ECCS trains are operable.

REFERENCES

- 1. Technical Specifications 3.5.2, ECCS - Operating.
- 2. Technical Specifications 3.5.2, Basis.
- 3. Technical Specifications 3.5.3, ECCS - Shutdown.
- 4. Technical Specifications 3.5.3, Basis.

83. 026G2.4.48 001/1/1/CCW RHR COOLDOWN/C/A 3.8/N/VG05301/S/MAB/RSB

Unit 1 was operating at full power for 200 days and was preparing to shutdown for a refueling outage next week when an RCS leak developed. The plant shut down 20 hours ago and is currently cooling down to cold shutdown.

Current plant conditions are:

- The Unit RCS Temperature is 335 °F and RHR Train "A" shutdown cooling is in service.
- RHR train "B" is aligned for ECCS injection.
- RCPs 1, 2, and 3 are shut down
- ALB 008-D06, CCW TRAIN A RHR HX LO FLOW, is in alarm.
- Operators inform the SRO that the CCW Pump #1 has tripped and CCW Pump #5 cannot be started.
- The SRO declares CCW train "A" inoperable.

Which ONE of the following correctly describes actions that are required to be taken by the crew in response to the above conditions?

- A. Do not align RHR Train B for shutdown cooling until RCS temperature is less than 250 °F. Continue the cooldown to 250 °F using the available steam generator(s). Immediately take action to restore one additional RCS loop to operation.
- B. Immediately align RHR Train B for shutdown cooling and immediately take action to restore one additional RCS loop to operation.
- C✓ Do not align RHR Train B for shutdown cooling until RCS temperature is less than 250 °F. Continue the cooldown to 250 °F using the available steam generator(s).
- D. Immediately align RHR Train B for shutdown cooling, but action to restore one additional RCS loop to operation is not required.

K/A

026 Loss of Component Cooling Water

G2.4.48 Ability to interpret control room indications to verify the status and operation of the system, and understand how operator actions and directives affect plant and system conditions.

K/A MATCH ANALYSIS

The alarm is a control room indication (maybe the CCW flow also). The CCW system is in an abnormal configuration with flow at 4000 gpm to the RHR HX (partial loss of CCW). The Question also requires RHR/CCW system design knowledge for the applicant to know what actions are needed to accomplish the cooldown.

ANSWER / DISTRACTOR ANALYSIS

operating and RHR B operable. Plausible because with RHR aligned for ECCS injection, the applicant may mistakenly believe it cannot be used to meet the minimum loops operable requirement in TS 3.4.6.

B. Incorrect. See C below for SR 3.5.3.1 and 12006-C guidance. While RHR in the shutdown cooling mode will remain operable for ECCS injection mode, 12006 provides more restrictive limits on single RHR Train operation in SDC mode above 250F that must be followed. Plausible because relying on TS 3.5.3 alone would allow the only remaining RHR train to be aligned for SDC in mode 4. See C below for TS 3.4.6 operability. Plausible because, with RHR aligned for ECCS injection, the candidate may mistakenly believe it cannot be used to meet the minimum loops operable requirement in TS 3.4.6.

C. Correct. While RHR train B is in SDC mode, it will remain operable for ECCS injection in this mode. 12006 provides more restrictive limits on single train RHR operation in the SDC mode above 250F that must be followed. 12006-C directs continuing the cooldown using SGs in lieu of the only available RHR train until temp is less than 250F, which meets the more restrictive limitations imposed by 12006-C to ensure operability as ECCS source is maintained. One RHR loop operable/operating and one RCS loop operating meet the requirements of TS 3.4.6, RCS loops - Mode 4.

D. Incorrect. While RHR Train B in the SDC mode will remain operable for ECCS injection in this mode, 12006 provides more restrictive limits on the single RHR train operation in SDC mode above 250F that must be followed. Plausible because relying on the TS 3.5.3 alone would allow only remaining RHR train to be aligned for SDC in mode 4.

REFERENCES

1. V-LO-TX-12101, Residual Heat Removal System, Rev. 1.0.
2. 1A1-D06, CCW TRAIN A RHR HX LO FLOW, Rev. 15, 03/26/2004.
3. 12006-C, Unit Cooldown To Cold Shutdown, Rev. 64, 05/12/2004.
4. 13011-1, Residual Heat Removal System, Rev. 56, 05/20/2004.
5. 13715-1, Component Cooling Water System, Rev. 18, 08/06/2003.

84. 029EA2.05 001/1/1/ATWS ATWT PORV/C/A 3.4/N/VG05301/S/MAB/RSB

Unit 1 has exceeded the High Pressure Reactor Trip Setpoint, but the reactor did not trip. The crew is performing 19211, FR-S.1 Response To Nuclear Power Generation / ATWT, to initiate emergency boration. The crew notes that the Pressurizer pressure is 2400 psig and control rods have not yet been inserted. Both Pressurizer PORV valve position indicating green lights are on and red lights are off.

Which ONE of the following procedural actions should the SRO direct and what are the reasons for those actions?

- A. Do not open the Pressurizer PORVs due to DNB concerns.
- B. Do not open the Pressurizer PORVs due to containment atmosphere concerns.
- C. Open the Pressurizer PORVs and reduce pressure to avoid exceeding ASME pressure vessel code requirements.
- D. Open the Pressurizer PORVs and reduce pressure to allow for adequate boration flow to the core.

K/A

029 ATWS

EA2.05 Ability to determine or interpret the following as they apply to an ATWS:
System component valve position indications.

K/A MATCH ANALYSIS

PORVs are indicating closed and they should be open, and are procedurally required to be open, in order to ensure adequate boration flow. The question is SRO level because it tests the basis behind the step.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. PORVs are required to be open (19211-C, Step 5). Plausible because DNB is more likely as pressure lowers.
- B. Incorrect. PORVs are required to be open (19211-C, Step 5). Plausible because opening PORVs will send RCS water to PRT which has a rupture disk.
- C. Incorrect. Safety Valves will protect vessel and the procedure requires the PORVs to be opened to raise boration flow, not protect the vessel. Plausible because there are high pressure requirements for the vessel.
- D. Correct. See 19211-C and Referenced lesson plan.

REFERENCES

- 1. 19211-C, FR-S.1 Response To Nuclear Power Generation / ATWT, Rev. 16, 02/25/2004.
- 2. LO-LP-37041, Anticipated Transient Without Trip, Rev. 12, 12/29/1999.
- 3. V-LO-TX-16001, Primary Systems, Rev. 3.0.

85. 035G2.1.20 001/2/2/TECH SPEC SG STEAM G/C/A 4.2/M/VG05301/S/MAB/RSB

The following Unit 1 conditions exist:

- The reactor is at 10% power.
- SG # 1 Primary to Secondary Leakage = 0.5 gpm
- SG # 2 Primary to Secondary Leakage = 0.1 gpm
- SG # 3 Primary to Secondary Leakage = 0.1 gpm
- SG # 4 Primary to Secondary Leakage = 0.2 gpm
- Pressurizer PORV-456A is leaking to the PRT at 1.2 gpm

Which ONE of the following correctly states the status of Technical Specification LCO 3.4.13, RCS Operational LEAKAGE, and the basis?

- A✓ Primary to Secondary Leakage limit is exceeded. The limit is based on the assumption that a single crack leaking at the maximum allowed rate would not propagate to a SGTR under the stress conditions of a LOCA.
- B. Primary to Secondary Leakage limit is exceeded. The limit is to ensure that 10 CFR Part 20 - Standards For Protection Against Radiation, requirements are not violated.
- C. Unidentified Leakage limit is exceeded. The limit is to prevent continued degradation of the Reactor Coolant Pressure Boundary.
- D. Unidentified Leakage limit is exceeded. The limit is to ensure pressurizer level will be maintained in the event of a reactor trip.

K/A

035 Steam Generator

G2.1.20 Ability to execute procedure steps.

K/A MATCH ANALYSIS

Tech Specs can be considered a procedure that is used by the operators. The question tests the knowledge of whether or not a limit is violated and what the basis of the limit is. The applicant must have this knowledge in order to have the ability to execute the Tech Specs. Testing the basis info makes it SRO-only level.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. 0.5 gpm = 720 gpd, which is greater than TS limit.
- B. Incorrect. Incorrect basis given. Plausible because it is partially correct.
- C. Incorrect. All leakage listed in stem is identified leakage. Plausible because applicant may think that PORV leakage is unidentified and at 1.2 gpm, this would exceed the limit.
- D. Incorrect. All leakage listed in stem is identified leakage. Plausible for same reason as C above.

REFERENCES

- 1. Technical Specification 3.4.13, Operational Leakage.
- 2. Technical Specification 3.4.13 Basis.
- 3. Vogtle Exam Bank Question LO-LP-16001-07-05.
- 4. Vogtle Exam Bank Question LO-LP-39202-01-21 (Just verifies that facility considers PORV leakage as identified).

86. 038G2.4.46 001/1/1/SGTR MSIS MSIV/C/A 3.6/N/VG05301/S/MAB/RSB

Unit 1 tripped three minutes ago.

Currently plant conditions are as follows:

- Steam Generator Pressures:
 - SG #1 = 583 psig and lowering.
 - SG #2 = 585 psig and lowering.
 - SG #3 = 600 psig and lowering.
 - SG #4 = 605 psig and lowering.
- Steam Generator NR Levels are:
 - SG #1 = 0%.
 - SG #2 = 0%.
 - SG #3 = 5% and lowering.
 - SG #4 = 0%.
- The Condenser Air Ejector Radiation Monitor is in alarm and the indication is rising.
- RCS Pressure is 1600 psig and lowering.
- Operators are at the point in 19000-C, E-0 Reactor Trip or Safety Injection, where they are evaluating if Main Steam Lines should be isolated.

Which ONE of the following correctly states the status of the Main Steam Line Isolation Valves, the required actions, and reasons for those actions?

- A. Main Steam Isolation should have occurred, but did not. Attempt to close all Main Steam Line Isolation Valves to limit a radiation release to the atmosphere.
- B✓ Main Steam Isolation should have occurred, but did not. Attempt to close all Main Steam Line Isolation Valves to prevent pressurized thermal shock conditions due to the increased tensile stress on the outside wall of the reactor vessel.
- C. Main Steam Isolation did not occur because it was designed not to occur under the given conditions. Monitor steam generator pressures to ensure that Main Steam Isolation occurs when appropriate setpoints are reached to prevent pressurized thermal shock conditions.
- D. Main Steam Isolation did not occur because it was designed not to occur under the given conditions. Manually close all Main Steam Isolation Valves to limit the radiation release to the public.

K/A

038 Steam Gen. Tube Rupture

G2.4.46 Ability to verify that the alarms are consistent with the plant conditions.

K/A MATCH ANALYSIS

All SGs are blowing down, which has caused a SGTR in #3 SG, as evidenced by its level being slightly higher than the other 3 SGs and the Air Ejector Rad alarm. The Air Ejector Rad alarm is indication that a main stm iso did not occur. The isolation should have occurred, therefore the air ejector rad monitor is not consistent with the plant conditions.

ANSWER / DISTRACTOR ANALYSIS

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

REFERENCES

1. V-LO-TX-28101, RPS-SSPS-AMSAC, Rev. 3.
2. LO-LP-37121-17-C, Loss of Secondary Coolant / Faulted SG, Rev. 17, 09/13/2000.
3. 19000-C, E-0 Reactor Trip or Safety Injection, Rev. 29, 06/25/2004.

87. 061G2.4.18 001/2/1/SG DRYOUT HEAT SINK/MEM 3.6/N/VG05301/S/MAB/RSB

The following conditions exist on Unit 1:

- The plant was at 100% power for the last 12 months prior to the reactor tripping due to a loss of Main Feedwater Pumps
- 19231-C, FR-H.1, Response to Loss of Secondary Heat Sink, is in progress
- MDAFW Pump B has just been started
- The BOP is feeding SGs 1 and 4 through the AFW cross tie valves
- The SRO has just cautioned the BOP to limit AFW flow to 600 gpm

What is the basis for limiting AFW flow to 600 gpm?

- A✓ To prevent MDAFW Pump B from reaching runout conditions.
- B. To ensure an adequate secondary heat sink is established with SG NR level less than 10% if RCS bleed and feed is in progress.
- C. To prevent excessive RCS cooldown if RCPs are secured.
- D. To prevent thermally shocking SG tubes in a hot dry SG.

QUESTION PROVIDED BY FACILITY ON 05/24/2005.

K/A

061 Auxiliary/Emergency Feedwater

G2.4.18 Knowledge of the specific bases for EOPs.

K/A MATCH ANALYSIS

K/A is met because the question tests the information located in the EOP lesson plan for the basis to a caution. It is SRO-only knowledge because it is basis information.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Per provided references.
- B. Incorrect. Plausible since 570 gpm is the min required AFW flow for secondary heat sink. Heat sink requirements are not met until SG NR L > 10% established with an RCS feed and bleed I/P.
- C. Incorrect. Plausible since there is a note to limit feed flow rates to prevent excessive SG depressurization with no RCPs running.
- D. Incorrect. Plausible since this is the correct reason for limiting flow rates to a hot dry SG, but 600 gpm is above the limit of 30 - 100 gpm.

REFERENCES

1. Lesson Plan LO-LP-37051-17-C, Rev. 17, July 2, 2004.
2. 19231-C, FR-H.1, Response to Loss of Secondary Heat Sink, Rev. 26.5.

88. 064A2.05 001/2/1/DIESEL EDG/C/A 3.2/N/VG05301/S/MAB/RSB

The following Unit 1 conditions exist:

- A loss of offsite power occurs
- Offsite power is projected to be unavailable for several hours and the SAT is unavailable
- Both Emergency Diesel Generators (EDGs) have a speed of 440 rpm
- A common voltage regulator malfunction has occurred in both EDGs resulting in:
 - The "A" EDG voltage reaching 4000 VAC
 - The "B" EDG voltage reaching 3700 VAC
 - Neither EDG output voltage can be raised above its current indication
- The following alarms are energized:
 - ALB38-E01, "DG1B TROUBLE"
 - ALB38-E02, "DG1B LOW VOLTAGE"
 - All Train "B" 4160 VAC and 480 VAC switchgear MCC trouble alarms on ALB37
 - ALB37-A04, "SEQ B TROUBLE" energized

Which ONE of the following correctly describes the actions the USS should direct to mitigate the electrical problems?

- A✓ Direct the operator to Emergency Trip both EDGs and implement 19100-C, "ECA-0.0 Loss of All AC Power" and 13145-1, "Diesel Generators" to swap to the alternate voltage regulators for both EDGs.
- B. Direct the operator to Emergency Trip both EDGs and implement 19100-C, "ECA-0.0 Loss of All AC Power" and 13427-1, "4160 V AC 1E Electrical Distribution System" to restore offsite power to either emergency bus when an offsite source is made available.
- C✓ Direct the operator to Emergency Trip EDG 1B and implement 18031-C, "Loss of Class 1E Electrical Systems" and 13145-1, "Diesel Generators" to swap to the alternate voltage regulators for EDG 1B.
- D. Do not trip either EDG. Implement 18031-C, Loss of Class 1E Electrical Systems" and 13145-1, "Diesel Generators" to swap to the alternate voltage regulators for the EDGs. The voltage regulator swaps can occur with the EDGs running.

K/A

064 Emergency Diesel Generator

A2.05 Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loading the ED/G.

K/A MATCH ANALYSIS

The "B" EDG does not load due to the voltage regulator problem. In order to get it to load, the guidance in the AOP will direct operators to an SOP which will address voltage regulator problems.

SRO only because ROs are required to know entry conditions, but SROs are also required to make transitions between procedures.

ANSWER / DISTRACTOR ANALYSIS

- correct*
see
- A. ~~Incorrect~~. A total loss of AC does not occur because the "A" EDG starts and loads. Plausible because if the applicant does not realize that the "A" EDG output breaker will close at 4000 Vac, then ECA-0.0 would be required. *THIS ANSWER WAS ACCEPTED*
- B. Incorrect. *based on Post Exam Comment Resolution. see*
- C. Correct. The AOP is appropriate for loss of a single safety bus. The AOP also contains guidance to direct operators to 13145-1 where voltage regulator problems are addressed. *6/14/05*
- D. Incorrect. See utility fax.

REFERENCES

1. 18031-C, Loss of Class 1E Electrical Systems, Rev. 20.1, 12/19/2003.
2. 19100-C, ECA-0.0 Loss of All AC Power, Rev. 28, 12/19/2003.
3. 13145-1, Diesel Generators, Rev. 56, 07/22/2004.
4. 13427-1, 4160V AC 1E Electrical Distribution System, Rev. 34.1, 08/01/2003.
5. V-LO-TX-11101, Emergency Diesel Generator, Rev. 4.

89. 067G2.4.28 001/1/2/FIRE SABOTAGE REPORT/C/A 3.3/N/VG05301/S/MAB/RSB

The following sequence of events occurred on Unit 2:

- At 0915 hours a small fire was discovered in the protected area outside of the Vital Area.
The fire burned itself out in about 5 minutes.
- At 0930 hours Security personnel found a bomb device that had started the fire.
- At 0950 hours the Shift Manager was notified by the Security Manager of a confirmed security event associated with the bomb device.
- At 1000 hours, the Shift Manager classified the event in accordance with 91001-C, "Emergency Classification and Implementing Instructions."

Which ONE of the following correctly states when the NRC was required to be notified in accordance with 91002-C, "Emergency Notifications?"

- A. 1015 hours
- B. 1030 hours
- C. 1050 hours
- D✓ 1100 hours

K/A

067 Plant Fire On-site

G2.4.28 Knowledge of procedures relating to emergency response to sabotage.

K/A MATCH ANALYSIS

The fire was a result of sabotage and the reportability requirements are contained in procedures.

ANSWER / DISTRACTOR ANALYSIS

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

REFERENCES

1. 00152-C, Federal and State Reporting Requirements, Rev. 33, 02/20/2004.
2. 91001-C, Emergency Classification and Implementing Instructions, Rev. 20.1, 09/12/2000.

90. 069G2.1.33 001/1/2/CONTAINMENT PRESSURE/MEM 4.0/N/VG05301/S/MAB/RSB

Which ONE of the following states a condition that would require entry into the Containment Pressure Technical Specification (LCO 3.6.4) action statement and the Technical Specification Basis for that requirement? (Assume Unit 1 is in Mode 1.)

- A. Containment pressure is + 1.8 psig (positive 1.8 psig). The high containment pressure requirement is in place as an Accident Analysis input for the Loss Of Coolant Accident (LOCA), which is more limiting than the Steam Line Break (SLB) Accident Analysis with respect to peak containment pressure. Therefore, the LOCA analysis bounds the SLB analysis with respect to peak containment pressure.
- B. Containment pressure is + 1.9 psig (positive 1.9 psig). The high containment pressure requirement is in place as an Accident Analysis input for the Steam Line Break (SLB) Accident Analysis, which is more limiting than the Loss Of Coolant Accident (LOCA) with respect to peak containment pressure. Therefore, the SLB analysis bounds the LOCA analysis with respect to peak containment pressure.
- C. Containment pressure is - 0.3 psig (negative 0.3 psig). The low containment pressure requirement protects against a containment design negative pressure limit of - 2.0 psig (negative 2.0 psig) in the event of an inadvertant containment spray actuation.
- D✓ Containment pressure is - 0.4 psig (negative 0.4 psig). The low containment pressure requirement protects against a containment design negative pressure limit of - 3.0 psig (negative 3.0 psig) in the event of an inadvertant containment spray actuation.

K/A

069 Loss of CTMT Integrity

G2.1.33 High Containment Pressure - Ability to recognize indications for system operational parameters which are entry-level conditions for technical specifications.

K/A MATCH ANALYSIS

The question meets the K/A because the applicant must recognize the entry condition for the TS. The question is SRO-only because the applicant must then use TS Basis knowledge to decipher between the two answers that display data that is outside of that allowed by the LCO. The question is closed book because all applicants are required to know 1-hr TS without reference and basis info is closed book required knowledge for SRO applicants.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. P not high enough to exceed TS.
- B. Incorrect. SLB bounds LOCA. Plausible because P is above TS limit.
- C. Incorrect. P is within allowable TS LCO requirement and negative P limit is -0.3 psig. Plausible because P is at the limit, but not is not exceeding the limit.
- D. Correct. P is below TS low limit and basis is correct according to Ref. 2 below.

REFERENCES

- 1. Technical Specification LCO 3.6.4.
- 2. Technical Specification Bases for LCO 3.6.4.

91. 072A2.02 001/2/2/AREA RADIATION ARM/C/A 2.9/N/VG05301/S/MAB/RSB

The following radiation monitors were declared inoperable yesterday.

RE-2565A, Containment Particulate Monitor
RE-2565B, Containment Iodine Monitor
RE-2565C, Containment Gaseous Monitor

Now Unit 1 Tavg is 300 °F and heating up when RE-003, Containment Area Low Range Monitor, is declared inoperable due to a detector failure.

Which ONE of the following correctly describes the compliance status of LCO 3.3.6, Containment Ventilation Isolation Instrumentation?

- A. LCO 3.3.6 is met, therefore no action statements are required to be entered.
- B. LCO 3.3.6 is not met. Performing maintenance and declaring RE-2565A operable would meet the LCO allowing all action statements to be exited.
- C. LCO 3.3.6 is not met. Performing maintenance and declaring RE-2565B operable would meet the LCO allowing all action statements to be exited.
- D. LCO 3.3.6 is not met. Performing maintenance and declaring RE-003 operable would meet the LCO allowing all action statements to be exited.

K/A

072 Area Radiation Monitoring

A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the ARM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Detector failure.

K/A MATCH ANALYSIS

RE-003, an area monitor, is inoperable due to a detector failure. Tech Specs are impacted by this failure and must be complied with to correct, control, or mitigate the consequences. The question is SRO-only level because it requires basis knowledge to arrive at the answer. The question is closed book because if RE-003 were also inoperable, there would be an immediate action for Action Statement B (< 1 hr TS are memory items).

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Two operable channels do not exist. Plausible because applicant may not know what configuration makes two operable channels.
- B. Incorrect. RE-2565B or C would also need to be declared operable for this channel to be operable.
- C. Incorrect. RE-2565A or C would also need to be declared operable for this channel to be operable.
- D. Correct. TS Basis states that RE-002 and RE-003 are separate channels, thus making RE-003 operable would allow the LCO to be met.

REFERENCES

1. Technical Specification 3.3.6, Containment Ventilation Isolation Instrumentation.
2. Technical Specification 3.3.6 Basis.

92. 074G2.4.6 001/1/2/INADEQUATE CORE COOL/MEM 4.0/M/VG05301/S/MAB/RSB

In 19221-C, Response to Inadequate Core Cooling, contains the following two steps:

- (a) If attempts to establish high head safety injection using the high head portion of safety injection are ineffective, then depressurize the intact steam generators (SG) to atmospheric pressure.
- (b) If SG level is above a minimum value, then start the respective reactor coolant pump (RCP).

Which ONE of the following correctly describes the basis for these two steps?

- A✓ (a) Intact SG are depressurized to lower the pressure in the RCS to raise accumulator flow and low head ECCS flow.
- (b) The steam generator level must be above a minimum value to ensure that SG tubes are kept cool to prevent creep rupture failure of the SG tubes after starting the RCP.
- B. (a) Intact SG are depressurized to lower the pressure in the RCS to raise accumulator flow and low head ECCS flow.
- (b) The steam generator level must be above a minimum value to ensure a heat sink is available for cooling the core once the RCP is started.
- C. (a) Intact SG are depressurized to lower the pressure in the RCS to prevent pressurized thermal shock conditions in the reactor vessel.
- (b) The steam generator level must be above a minimum value to ensure a heat sink is available for cooling the core once the RCP is started.
- D. (a) Intact SG are depressurized to lower the pressure in the RCS to prevent pressurized thermal shock conditions in the reactor vessel.
- (b) The steam generator level must be above a minimum value to ensure that SG tubes are kept cool to prevent creep rupture failure of the SG tubes after starting the RCP.

K/A

074 Inad. Core Cooling

G2.4.6 Knowledge of symptom based EOP mitigation strategies.

K/A MATCH ANALYSIS

The question tests knowledge of the symptoms based EOP mitigation strategy, namely the basis behind EOP steps. Because the basis is being tested, the question is considered SRO-only level.

ANSWER / DISTRACTOR ANALYSIS

- A. Correct. Per referenced lesson plan and corroborated with two Vogtle Exam Bank Questions.
- B. Incorrect. See referenced lesson plan. Plausible because it is desirable to have SG level for core cooling also, but the basis for the step is as stated in the lesson plan.
- C. Incorrect. See referenced lesson plan. Plausible because it is desirable to have SG level for core cooling also, but the basis for the step is as stated in the lesson plan. Also plausible because lowering RCS pressure is considered a good thing when trying to prevent PTS (but cooling down is not).
- D. Incorrect. See referenced lesson plan. Plausible because it is partially correct.

REFERENCES

- 1. LO-LP-37061-10, Response to Inadequate Core Cooling, Rev. 10, 01/09/2002.
- 2. Vogtle Exam Bank Question LO-LP-37061-02-04.
- 3. Vogtle Exam Bank Question LO-LP-37061-02-06

93. 076G2.4.11 001/2/1/EDG NCSW/MEM 3.6/N/VG05301/S/MAB/RSB

The plant is at 100% power. "A" train nuclear service cooling water is completely lost while running a surveillance test on the "A" diesel generator (DG).

Which ONE of the following describes the correct actions to be taken by the SRO while performing 18021-C, Loss of Nuclear Service Cooling Water?

- A. Direct the operator to depress and hold the "A" Run / Stop Push Button ("A" Pull-To-Run / Push-To-Stop Button), located at the DG. Due to Technical Specification 3.0.6, which describes the rules of operability for supported equipment, the "A" DG does not need to be declared inoperable.
- B. Direct the operator to depress and release the "A" Run / Stop Push Button, located at the Engine Control Panel. Declare the "A" DG inoperable and enter Technical Specification 3.8.1, "AC Sources - Operating".
- C. Direct the operator to emergency trip the "A" DG and initiate action to place the DG in Maintenance Mode. Due to Technical Specification 3.0.6, which describes the rules of operability for supported equipment, the "A" DG does not need to be declared inoperable.
- D✓ Direct the operator to Emergency Trip the "A" DG and initiate action to place the DG in Maintenance Mode. Declare the "A" DG inoperable and enter Technical Specification 3.8.1, "AC Sources - Operating".

K/A

076 Service Water

G2.4.11 Knowledge of abnormal condition procedures.

K/A MATCH ANALYSIS

The question tests knowledge of operability and shutting down the DG to preclude inadvertent start when NSCW is not available (guidance in AOP). The question is SRO-only knowledge because of the operability determination.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect.
- B. Incorrect.
- C. Incorrect.
- D. Correct. Refer to 18021-C, Page 6 and Tech Spec 3.7.8.

REFERENCES

- 1. 13145-1, Diesel Generators, Rev. 56, Page 28 and 29.
- 2. Tech Spec 3.8.1
- 3. Tech Spec 3.7.8
- 4. Tech Spec 3.0.6
- 5. 18021-C, Loss of Nuclear Service Cooling Water System, Rev. 13

94. G2.1.14 001/3//NOTIFICATIONS ALARMS/C/A 3.3/N/VG05301/S/MAB/RSB

While performing an emergency downpower, all annunciators in the Unit 1 Control Room are unexpectedly lost at 0900 hours and the SS makes an emergency classification at 0910 hours.

Which ONE of the following describes the emergency classification and required notifications?

- A. The SS was required to declare a NOUE and was expected to notify plant personnel by 0905.
- B. The SS was required to declare a NOUE and was expected to notify plant personnel by 0915.
- C. The SS was required to declare an Alert and was expected to notify plant personnel by 0905.
- D. The SS was required to declare an Alert and was expected to notify plant personnel by 0915.

K/A

G2.1.14

Knowledge of system status criteria which require the notification of plant personnel.

K/A MATCH ANALYSIS

ED is expected to notify plant personnel within 5 minutes of declaring an Alert or higher. The system status portion of the K/A is met by giving them a total loss of annunciators.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Unplanned loss of annunciators places plant in automatic Alert.
- B. Incorrect. Unplanned loss of annunciators places plant in automatic Alert.
- C. Incorrect. Expectation is within 5 minutes of declaring Alert or higher.
- D. Correct. Alert declared at 0910 and expectation is within 5 minutes of declaring Alert.

All distractors are plausible based on memory nature of items.

REFERENCES

1. LO-LP-40101-39-C, EPIP Overview, Rev. 39, 05/03/2004.
2. 91001-C, Emergency Classification and Implementing Instructions, Rev. 20.1, 09/12/2000.

95. G2.2.21 001/3//RHR PMT OPERABILITY/MEM 3.5/N/VG05301/S/MAB/RSB

The "A" Train RHR Pump impeller was replaced and a significant portion of its motor control circuit wiring was replaced.

Which ONE of the following correctly describes post maintenance testing requirements for the work that was performed?

- A. Perform flow capacity performance tests (Inservice Test) at the Tech Spec Runout flow or maximum Accident Analysis flow, but mini-flow conditions are not required to be tested. An Auto-start Functional Test must also be performed, but a Manual Start/Stop Test is not required to be performed.
- B✓ Perform flow capacity performance tests (Inservice Test) at the Tech Spec Runout flow or maximum Accident Analysis flow AND at mini-flow conditions. Test signals shall be used to verify the auto-start functions and Manual Start/Stop Test must also be performed.
- C. Perform flow capacity performance tests (Inservice Test) at the Tech Spec Runout flow or maximum Accident Analysis flow, but mini-flow conditions are not required to be tested. Test signals shall be used to verify the auto-start functions and Manual Start/Stop Test must also be performed.
- D. Perform flow capacity performance tests (Inservice Test) at the Tech Spec Runout flow or maximum Accident Analysis flow AND at mini-flow conditions. An Auto-start Functional Test must also be performed, but a Manual Start/Stop Test is not required to be performed.

K/A

G2.2.21

Knowledge of pre- and post- maintenance operability requirements.

K/A MATCH ANALYSIS

The proper post-maintenance tests must be performed as a basis for declaring the pump operable. The question tests knowledge of PMT and operability, which are SRO-only required knowledge.

ANSWER / DISTRACTOR ANALYSIS

B. Correct. See referenced procedure, Pages 22 - 25.

A & C Incorrect. Plausible because applicant may not know the requirements for testing at mini-flow conditions because the more important concern may be flow to the core.

D. Incorrect. A Manual start/stop test is required. Plausible because the first part of the distractor is correct.

REFERENCES

1. 29401-C, Work Order Functional Tests, Rev. 20, 07/03/2003.

96. G2.2.7 001/3//50.59 TS FSAR TECH/C/A 3.2/N/VG05301/S/MAB/RSB

The plant manager has assigned you to develop a test which is not described in the FSAR and requires a change to the Plant's Technical Specifications.

Which ONE of the following correctly describes the approval process with respect to 10 CFR 50.59, "Changes, Tests, and Experiments," in accordance with 00056-C, 10 CFR 50.59 Screening and Evaluations?

- A. A 10 CFR 50.59 Screening is required, but no Evaluation is needed because the test will be classified as "Screened Out."
- B. A 10 CFR 50.59 Evaluation is required with Plant Review Board approval. NRC approval is not required.
- C. A 10 CFR 50.59 Evaluation and a License Amendment are required regardless of the effect on the risk to the public.
- D. A 10 CFR 50.59 Evaluation and a License Amendment are required only if there is an increased risk to the public.

K/A

G2.2.7

Knowledge of the process for conducting tests or experiments not described in the safety analysis report.

K/A MATCH ANALYSIS

Question tests knowledge of conducting a test that is not described in the FSAR.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. A Safety Evaluation is required.
- B. Incorrect. NRC approval is required because the TS change is a change to the Op License.
- C. Correct. A License Amendment is required because of the TS Change.
- D. Incorrect. The Safety Evaluation is required to determine if there is an increased risk to the public, therefore it is required even if there is no increased risk.

All distractors are plausible because they all pertain to parts of the process that must be followed when making changes to the plant or the procedures that guide operation of the plant.

REFERENCES

1. 00056-C, 10 CFR 50.59 Screenings and Evaluations, Rev. 21.2, 10/03/2001.

97. G2.3.6 001/3//LIQUID WASTE RELEASE/MEM 3.1/N/VG05301/S/MAB/RSB

The USS has received a completed release permit for the following tanks:

- Waste Monitor Tank 009 (Unit 1)
- Waste Monitor Tank 010 (Unit 2)

Due to the plant schedule, Operations Management would like both tanks to be released at the same time in accordance with 13216-1 and 13216-2, Liquid Waste Release.

Which ONE of the following correctly states the procedure requirements given the above conditions?

- A. Two tanks may never be released at the same time under any conditions.
- B. Two tanks may be released without additional authorization because they are on different Units.
- C✓ The two tanks may be released simultaneously as long as the USS receives authorization from the Chemistry Superintendent.
- D. The two tanks may be released simultaneously as long as the USS receives authorization from the HP Supervisor.

QUESTION DELETED - NO CORRECT ANSWER - RSB 6/14/05

K/A

G2.3.6

Knowledge of the requirements for reviewing and approving release permits.

K/A MATCH ANALYSIS

The USS has the responsibility for approving release permits.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Two tanks may be released at the same time with Chem Superintendent permission. Plausible because it is logical that part of a controlled release would be one tank at a time.
- B. Incorrect. Two tanks may be released at the same time with Chem Superintendent permission. Plausible because applicant may think that as long as each tank meets specifications for release, that it would be OK to authorize both at the same time.
- C. Correct. See Step 2.1.6 of both referenced procedures.
- D. Incorrect. Chem Superintendent permission must be received. Plausible because applicant may think that HP Supv has authority to approve releases that may contain certain levels of radioactivity.

REFERENCES

1. 13216-1, Liquid Waste Release, Rev. 32, 08/05/2004.
2. 13216-2, Liquid Waste Release, Rev. 19, 08/05/2004.

98. G2.4.16 001/3//ATWS LOSS OF ALL AC/C/A 4.0/B/VG05301/S/MAB/RSB

Unit 1 was operating at 100% rated thermal power when a loss of offsite power occurred. The reactor failed to trip and the crew entered 19211-C, FR-S.1, Response to Nuclear Power Generation/ATWT. The "A" Train Diesel Generator energized its bus, and the "B" Train Safety Bus was grounded and de-energized. As the crew began performing steps in FR-S.1, the "A" Train Diesel Generator tripped and could not be restarted from the control room.

Which ONE of the following correctly describes the procedure transitions that the Unit Supervisor must direct?

- A. Complete all the actions of 19211-C and then go to 19100, ECA-0.0 Loss of All AC Power. Power will be restored to a safety bus using 13145, Diesel Generators, after completion of 19100.
- B. Complete all the actions of 19211-C and then go to 19100, ECA-0.0 Loss of All AC Power. Power will be restored to a safety bus using 13145, Diesel Generators, while completing 19100.
- C. Stop performance of 19211-C and immediately go to 19100, ECA-0.0 Loss of All AC Power. Power will be restored to a safety bus using 13145, Diesel Generators, after completion of 19100.
- D✓ Stop performance of 19211-C and immediately go to 19100, ECA-0.0 Loss of All AC Power. Power will be restored to a safety bus using 13145, Diesel Generators, while completing 19100.

K/A

G2.4.16

Knowledge of EOP implementation hierarchy and coordination with other support procedures.

K/A MATCH ANALYSIS

The question addresses the hierarchy of EOPs and ECAs, which is an EOP support procedure. The question is SRO level because it requires the applicant to know that the FRPs are developed with the assumption that at least one safety train of power is available.

ANSWER / DISTRACTOR ANALYSIS

- A. Incorrect. Operator will not exit ECA-0.0 prior to restoring power.
- B. Incorrect. FR-S.1 assumes power to one safety bus.
- C. Incorrect. Operator will not exit ECA-0.0 prior to restoring power.
- D. Correct. FR-S.1 assumes power to one safety bus. ECA-0.0 uses an "initiating" step to send operators to an SOP to try to get the EDG started.

Distractors are plausible because applicants may not know the assumptions behind the FRPs and may not know that they need to stop performing an FRP before it is completed because normally FRPs must be completed prior to exiting them (particularly the highest ranked safety function).

REFERENCES

- 1. Turkey Point 2002-301 SRO Exam Question.
- 2. LO-LP-37031-15-C, Loss of All AC Power, Rev. 15, 12/14/2000.
- 3. LO-LP-37002, Format and Use of EOP's, Rev. 14, 12/31/2002.
- 4. 19100-C, ECA-0.0 Loss of All AC Power, Rev. 28, 12/19/2003.

99. G2.4.44 001/3//PARS PROTECTIVE ACTION/MEM 4.0/N/VG05301/S/MAB/RSB

Which ONE of the following correctly states the minimum protective action recommendations following declaration of a General Emergency?

- A✓ Evacuate all people within a 2 mile radius and all people within 5 miles in the downwind affected zones. Shelter all remaining people within the 10 mile EPZ.
- B. Evacuate all people within a 5 mile radius and all people within 10 miles in the downwind affected zones. Shelter all remaining people within the 10 mile EPZ.
- C. Evacuate all people within a 2 mile radius and shelter all remaining people within a 5 mile radius.
- D. Evacuate all people within a 5 mile radius and shelter all remaining people within a 10 mile radius.

K/A

G2.4.44

Knowledge of emergency plan protective action recommendations.

K/A MATCH ANALYSIS

Question tests knowledge of PARs.

ANSWER / DISTRACTOR ANALYSIS

A. Correct. See referenced lesson plan and procedure.

B, C, D. Incorrect. See referenced lesson plan and procedure. Plausible because applicants may not correctly remember the minimum PARs as stated in the LP and Procedure.

REFERENCES

1. LO-LP-40101, EPIP Overview, Rev. 39, 05/03/2004.

2. 91035-C, Protective Action Guidelines, Rev. 19, 03/12/2004.

100. G2.4.45 001/3//EAL RAD MONITORS/MEM 3.6/M/VG05301/S/MAB/RSB

Unit 1 Operators are moving irradiated fuel in the reactor and spent fuel pool when a fuel handling accident occurs.

The following radiation monitors are in alarm:

- RE-005 (Containment High Range)
- RE-2562A (Containment Atmosphere)
- RE-2565A (Containment Vent)
- RE-008 (FHB)

Which ONE of the following radiation monitor alarms both will be used by the Emergency Director in assessing the Emergency Action Level?

- A✓ RE-005 and RE-008
- B. RE-008 and RE-2562A
- C. RE-008 and RE-2565A
- D. RE-005 and RE-2565A

K/A

G2.4.45

Ability to prioritize the significance of each annunciator or alarm.

K/A MATCH ANALYSIS

Question addresses alarm prioritization from the perspective of the Emergency Director. This allows for the K/A match at the SRO-only level because this is knowledge that the ED must have to effectively prioritize alarms to make an EAL Classification.

ANSWER / DISTRACTOR ANALYSIS

A. Correct. See Figure 4 of Reference 3 for correct answer.
B, C, D. Reference 2 provided for plausible distractors. Memory level nature of the question makes the distractors plausible.

REFERENCES

1. Byron SRO Exam Question G2.4.45, 06/29/2000.
2. V-LO-TX-32101 Digital Radiation Monitoring System (DRMS), Rev. 0.
3. 91001-C, Emergency Classification and Implementation Instructions, 09/12/2000.