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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000008 Pressurizer Vapor Space Accident / 3

AK1.01-Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: Thermodynamics and flow characteristics of open or leaking valves

Tier: 1      Group: 1      RO Imp: 3.2

Applicable 10CFR55 Section: 41.14

Palisades Learning Objective: PCS\_E01.01

References: **Steam Tables, Mollier Diagram (Provide)**

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**Question:**

Following a reactor trip caused by a loss of feedwater to the Steam Generators, one of the Pressurizer code safety valves is stuck slightly open. The following parameters are noted:

- PCS pressure = 900 psia
- PZR vapor space temperature = 532°F
- Quench Tank level = 50%
- Quench Tank pressure = 20 psig

What is the expected tail pipe temperature for the above plant conditions?

- a. 532°F
- b. 360°F
- c. 315°F
- d. 212°F

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**DISTRACTOR ANALYSIS**

- a. Plausible if candidate incorrectly chooses saturation temperature for 900 degrees F
- b. Plausible if candidate starts at 900psia saturation then constant enthalpy to sat line and reads temp
- c. **CORRECT - Saturation for 900psia, constant enthalpy to 37psia for QT then reads temp**
- d. Plausible if candidate assumes saturation temperature for atmospheric pressure in Containment

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**Level of Knowledge: HIGH****Difficulty: 4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 000009 Small Break LOCA / 3

EK2.03-Knowledge of the interrelations between the small break LOCA and the following: S/Gs

Tier: 1      Group: 1      RO Imp: 3.0

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBAG\_E05.01

References: Procedure: EOP-4.0

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**Question:**

For a Small Break LOCA event with all equipment operating as designed, which one of the following ensures adequate heat removal from the core?

- a. PCS flow out of the break with all PCPs operating.
  - b. Steam Generators.
  - c. PCS flow out of the break with 2 PCPs operating.
  - d. Safety Injection flow.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Related to a common misconception regarding the reason for trip two, leave two strategy. Here the candidate misapplies it, and mistakenly believes that forced circulation forces more coolant out of the break and therefore provides more cooling. PCPs actually add heat to the PCS when running.
  - b. **CORRECT**
  - c. Candidate again misapplies the trip two/leave two strategy. Here the candidate believes that core heat is being removed via forced circulation but the heat input from the PCPs is not as high as with all 4 PCPs in service
  - d. Safety Injection flow does provide some cooling, but the definition of a small break LOCA inherently implies minimal SI flow, due to the slow pressure reduction of the PCS, and therefore minimal cooling from SI flow.
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**Level of Knowledge:      LOW****Difficulty:              4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000011 Large Break LOCA / 3

EK3.10-Knowledge of the reasons for the following responses as they apply to the Large Break LOCA: PTS limits on RCS pressure and temperature

Tier: 1      Group: 1      RO Imp: 3.7

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: TBCORE\_CK02.0

References: EOP-4.0 basis step 6

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**Question:**

During a Loss of Coolant Accident (LOCA), P-50A and P-50D Primary Coolant Pumps are tripped when PCS pressure reaches 1300 psia. What is the reason for this action?

- a. Prevents pump operation when PCS pressure is below the 25°F sub-cooling curve of EOP Supplement 1.
  - b. Prevents pump operation when PCS pressure is below the minimum pressure of EOP Supplement 1.
  - c. Minimizes PCS inventory loss while maintaining diametrically opposed PCPs in service for core heat removal.
  - d. Minimizes PCS inventory loss while still maintaining PCS pressure control via Pressurizer spray valves.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Incorrect because if PCS pressure was <25° subcooling curve, all 4 PCPs would be tripped
  - b. Incorrect because if PCS pressure was <minimum for pump operation, all 4 PCPs would be tripped
  - c. Incorrect because diametrically opposed PCPs in operation is only preferred during normal operation
  - d. **Correct** because securing 2 PCPs allows the inventory loss to be minimized yet allows maximum PZR spray for pressure reduction to allow the HPSI pumps to replace PCS inventory.
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Level of Knowledge: LOW

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000015/000017 RCP Malfunctions (Loss of RC Flow) / 4

AA1.22-Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): RCP seal failure/malfunction

Tier: 1      Group: 1      RO Imp: 4.0

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBCORE\_CK05.0

References: ARP-5, window 7

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**Question:**

Given the following with the Plant operating at full power:

- A loss of all offsite power occurs
- Several minutes later the Control Room team notes that Lower Seal Temperature indications (on Panel C-11) for all four Primary Coolant Pumps (PCPs) are trending upward

This rising seal temperature is expected because ...

- a. Controlled Bleedoff from PCP seals is at a higher pressure due to isolation from the VCT.
  - b. Component Cooling Water is no longer circulating through the seal heat exchanger.
  - c. the Auxiliary Impeller is no longer providing forced flow through the seal cartridge area.
  - d. Controlled Bleedoff flow from PCP seals is now at a lower flow rate.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible if the student believes CBO flow is affected by the loss of all offsite power, to such an extent as to cause a rise in CBO pressure due to isolation from VCT.
  - b. Plausible if the student believes that CCW is isolated when the pump loses power. When the loss of all offsite power occurs, there is initially a load shed of the busses which power the CCW pumps. But as the EDGs start and load, two CCW pumps will be sequenced on and continue to provide CCW flow through the seal heat exchanger.
  - c. **CORRECT - PCS coolant flowing into the seal cavity is forced by the Seal impeller (also called Recirculation or auxiliary impeller) through the integral heat exchanger where it is cooled to approximately 130°F.**
  - d. Plausible if the student believes CBO flow is affected by the loss of all offsite power, to such an extent as to cause a rise in seal temperature indications.
- 
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Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000022 Loss of Rx Coolant Makeup / 2

AA2.04-Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup:  
How long PZR level can be maintained within limitsTier: 1      Group: 1      RO Imp: 2.9  
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: CVCS\_CK11.0

References: SOP-2A

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**Question:**

Given the following conditions:

- The Plant is in MODE 3 with PZR pressure at 2060 psia and  $T_{AVE}$  at 532°F
- A PCS dilution of 16,500 gal to critical boron concentration is planned
- The PCS Leakrate Calculation was completed one hour ago with PCS leakage at 0.008 gpm unidentified, 0 gpm identified leakage from all sources
- EK-0710, "VOLUME CONTROL TANK LO-LO LEVEL", is in alarm
- The NCOR noted that the Charging Pump suction swapped from the VCT to the SIRW Tank
- The CRS ordered CVCS letdown and charging isolated

With letdown isolated and charging pumps disabled from starting, what is the approximate time until PZR heaters are lost on low level?

- a. 52 minutes.
- b. 100 minutes.
- c. 105 minutes.
- d. 112 minutes.

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**DISTRACTOR ANALYSIS**

- a. Incorrect, VCT gal/% of 34.415 used
  - b. **Correct**, PZR level at 532°F = 42%. PZR heater low level cut-out = 36%. DWO-1, Att. 8, PCS Inventory Form, states convention factor for PZR level is 66.16gal/%. 4 gal/min leaves PCS via PCPs controlled bleed-off to VCT. Approximate time to PZR heater cut-out = 100 min.
  - c. Incorrect, 70gal/% used, not in calculation anywhere
  - d. Incorrect, PCS temperature change gal/1°F used
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Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000025 Loss of RHR System / 4

AK1.01-Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Loss of RHRS during all modes of operation

Tier: 1 Group: 1 RO Imp: 3.9

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: IOTF\_CK15.0

References: AOP-37 Section 6.4

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**Question:**

Given the following Plant conditions:

- PCS cooldown is in progress with a 20°F/Hour cooldown rate
- Shutdown Cooling is in service
- A Loss of all Instrument Air occurs

Which one of the following describes the Shutdown Cooling System response to the loss of Instrument Air?

Shutdown Cooling...

- a. flow is lost.
  - b. heat removal is lost.
  - c. flow is degraded.
  - d. heat removal is maximized.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible if the student believes that the SDC HX inlet/outlet and bypass valves fail closed
  - b. **CORRECT**
  - c. Plausible if the student believes that the SDC HX bypass valve does not fail open on loss of air
  - d. Plausible if the student believes that the HX inlet fails open and the bypass fails closed
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Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 000026 Loss of Component Cooling Water / 8

AA2.01-Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water:  
Location of a leak in the CCWSTier: 1      Group: 1      RO Imp: 2.9  
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: CCW\_CK13.0

References: ARP-7; AOP-36

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**Question:**

Given the following conditions:

- The Plant was at full power when an inadvertent Safety Injection Actuation occurred
- All systems responded as designed
- Two (2) minutes after the SIAS, EK-1172, "COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL", alarms
- CCW Surge Tank is 34% and lowering

Which one of the following describes the location of the leak in the CCW System?

- a. Spent Fuel Pool Cooling HX only.
  - b. Letdown HX only.
  - c. Shutdown Cooling HX only.
  - d. Spent Fuel Pool Cooling HX or Letdown HX.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible, however SFP Hx is isolated on SIAS by CV-0944A
  - b. Plausible, however leakage would be INTO the CCW system due to higher pressure of PCS through L/D Hx.
  - c. **Correct**
  - d. Plausible, combination of a and b above.
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Level of Knowledge: **HIGH**Difficulty: **4**

**WRITTEN QUESTION DATA SHEET**Source of Question: **BANK**

K/A: 000027 Pressurizer Pressure Control System Malfunction / 3

AA1.04-Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control

Malfunctions: Pressure recovery, using emergency-only heaters

Tier: 1 Group: 1 RO Imp: 3.9

Applicable 10CFR55 Section: 41.7, 41.10

Palisades Learning Objective: PPCS\_CK09.0

References: SOP-30; AOP-28

Question:

An automatic reactor trip occurred from full power due to a loss of offsite power. The following post reactor trip conditions exist:

- 152-211, PZR Heater Xfmr EX-16 Feeder Bkr, is open
- Both D/Gs started and loaded
- All other systems operated as designed
- Operators have completed EOP-1.0 SPTAs
- PZR level = 38%
- D/G 1-1 loading is currently 2000 KW
- D/G 1-2 loading is currently 2150 KW

Which one of the following describes the sequence of actions required to restore PZR Heaters from EX-16?

- a. (1) Raise PZR level to 40%  
(2) Operate 152-211CS to TRIP and then to CLOSE  
(3) Operate Group 2, 3, and 4 PZR Htr control switches as needed
- b. (1) Raise PZR level to 40%  
(2) Ensure CLOSED Pressurizer Spray valves, CV-1057/CV-1059  
(3) Place Group 1, 3, and 4 PZR Htr control switches to AUTO
- c. (1) Place PZR Htr Group 2, 3, and 4 control switches to OFF  
(2) Operate 152-211CS to TRIP and then to CLOSE  
(3) Operate Group 4 PZR Htr control switches as needed
- d. (1) Place Group 2, 3, and 4 PZR Htr control switches to OFF  
(2) Ensure CLOSED Pressurizer Spray valves, CV-1057/CV-1059  
(3) Place Group 3 and 4 PZR Htr control switches to MAN

**DISTRACTOR ANALYSIS**

- a. Plausible, if student believes Pressurizer level is too low and does not recognize that only one group of PZR Htrs can be operated when being supplied by Diesel Generator 1-2.
- b. Plausible, if student believes Pressurizer level is too low and that closing Pzr Spray valves is required for Pressure Control Safety Function
- c. **CORRECT, Pzr heater operation is limited by Diesel Generator loading**
- d. Plausible if the student believes that operation of Groups 3 and 4 PZR Htrs in Manual will maintain Diesel Generator loading below the maximum allowable load and closing spray valves is needed to restore pressure.

Level of Knowledge: **HIGH**Difficulty: **3**



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000029 ATWS / 1 EK3.09-Knowledge of the reasons for the following responses as they apply to the ATWS:  
Opening centrifugal charging pump suction valves from RWSTTier: 1      Group: 1      RO Imp: 3.7  
Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: TBAH\_E01.01 007

References: EOP-9.0, Success Path RC-2

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**Question:**

Given the following:

- The Plant has been at full power for the last 3 months
- One of the PCPs has just tripped but the Reactor failed to trip
- Following the PCP trip, Bus 1D de-energized due to a ground over-current event
- EOP-9.0, "Functional Recovery Procedure" has been entered and success path RC-1, "Control Rod Insertion" has failed
- Success path RC-2, "Boration using CVCS" will be utilized next

Which one of the following describes the prioritized order for Charging Pump suction alignment for boration in RC-2?

- a. (1) SIRWT  
(2) BAST through Gravity Feed Valves
- b. (1) BAST through Gravity Feed Valves  
(2) BAST through Boric Acid Pumps
- c. (1) BAST through Boric Acid Pumps  
(2) SIRWT
- d. (1) BAST through Gravity Feed Valves  
(2) SIRWT

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**DISTRACTOR ANALYSIS**

- a. Plausible if student believes that SIRW Boron Concentration will provide the required Shutdown Margin and assumes that SIRW Tk Outlet MO-2160 is opened to establish Emergency Boration.
- b. Plausible if student misapplies power supplies for Boric Acid Pumps and assumes they are available
- c. Plausible if student misapplies power supplies for Boric Acid Pumped Feed Valve
- d. **CORRECT, although one Boric Acid Pump is available, the Boric Acid Pumped Feed Isolation Valve has no power to its motor operator.**

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**Level of Knowledge: HIGH****Difficulty: 4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000038 Steam Gen. Tube Rupture / 3

EK1.03-Knowledge of the operational implications of the following concepts as they apply to the SGTR: Natural circulation

Tier: 1      Group: 1      RO Imp: 3.9

Applicable 10CFR55 Section: 41.10, 41.14

Palisades Learning Objective: TBAC\_E02.04

References: EOP-5.0, step 47, **Steam Tables (PROVIDE)**

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Question:

Given the following:

- The Plant was tripped due to a large tube rupture in the 'A' Steam Generator
- EOP-1.0, "Standard Post Trip Actions," have been completed
- The crew has transitioned to EOP-5.0, "Steam Generator Tube Rupture Recovery"
- Average temperature of Qualified CETs is 506°F
- All Primary Coolant Pumps have been secured

For the above conditions, which one of the following would indicate that natural circulation flow does NOT exist?

- a. Loop Hot Leg and Cold Leg temperatures are constant.
  - b. Loop Cold Leg temperatures are 461°F.
  - c. Loop Hot Leg temperatures are 488°F.
  - d. PCS Pressure is 920 psia.
- 

**DISTRACTOR ANALYSIS**

- a. Loop THs and TCs must be constant or lowering.
  - b. Core  $\Delta T$  must be  $< 50^\circ\text{F}$ ;  $506^\circ\text{F} - 461^\circ\text{F} = 45^\circ\text{F}$ .
  - c. **CORRECT** - Difference between Loop TH and average of Qualified CETs must be  $< 15^\circ\text{F}$ ;  $506 - 488 = 18^\circ\text{F}$ .
  - d. Subcooling must be  $> 25^\circ\text{F}$ ; Saturation temp for 920 psia is  $534^\circ\text{F}$  - CET Temp of  $506^\circ\text{F} = 28^\circ\text{F}$  subcooling.
- 

Level of Knowledge: HIGH

Difficulty: 3

**WRITTEN QUESTION DATA SHEET**Source of Question: **Modified Bank 2008 Audit RO Q#25**

K/A: CE/E05 Excessive Steam Demand / 4

EK1.3-Knowledge of the operational implications of the following concepts as they apply to the (Excess Steam Demand): Annunciators and conditions indicating signals, and remedial actions associated with the (Excess Steam Demand).

Tier: 1      Group: 1      RO Imp: 3.4  
Applicable 10CFR55 Section: 41.8, 41.10

Palisades Learning Objective: TBAD\_E03.01

References: EOP-6.0

**Question:**

Given the following:

- Containment pressure is 3.7 psig and rising
- 'A' S/G pressure is 550 psia and lowering rapidly
- 'B' S/G pressure is 880 psia and lowering slowly
- All four Primary Coolant Pumps are secured
- EOP-6.0, "Excess Steam Demand Event" has been implemented

Which one of the following remedial actions should be taken to control the overcooling transient and minimize Pressurized Thermal Shock (PTS) concerns in the Primary Coolant System?

- a. Maintain 'B' S/G within 50 psi above 'A' S/G until 'A' S/G reaches < -84%, then control the steaming and feeding rate of 'B' S/G.
- b. Delay steaming 'B' S/G until 'A' reaches < -84%, then control the steaming and feeding rate of 'B' S/G.
- c. Maintain 'B' S/G within 50 psi above 'A' S/G until 'A' loop T-colds are no longer lowering, then control the steaming and feeding rate of 'B' S/G.
- d. Delay steaming 'B' S/G until 'A' loop T-colds are no longer lowering, then control the steaming and feeding rate of 'B' S/G.

**DISTRACTOR ANALYSIS**

- a. Plausible if the student confuses conditions with the mitigating strategy for transition to Once Through Cooling in EOP-7.0
- b. Incorrect but plausible if the student believes that the intact S/G will immediately begin to remove heat from the PCS.
- c. **CORRECT, the residual heat in the intact S/G must be removed while the faulted S/G blows dry to be available for heat removal.**
- d. Same reason as distractor b above.

Level of Knowledge: **HIGH**Difficulty: **4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: CE/E06 Loss of Feedwater / 4

EK2.2-Knowledge of the interrelations between the (Loss of Feedwater) 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.

Tier: 1      Group: 1      RO Imp: 3.5

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: AFW\_CK10.0

References: E-17 Sheet 21A

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**Question:**

Given the following sequence of events:

- The reactor trips from full power due to a spurious turbine trip
- S/G levels lower to 24%
- AFW Pump, P-8A does not auto start
- AFW Pump, P-8C auto starts and supplies AFW to both S/Gs
- After 30 minutes, P-8C trips unexpectedly
- AFAS is not reset

Which one of the following describes the expected AFW system response?

- a. No AFW pumps will start automatically.
- b. P-8A will start after 30.5 seconds.
- c. P-8B will auto start immediately.
- d. P-8B will start approximately 112.5 seconds later.

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student does not recognize that P-8B is still in AUTO with a standing AFAS signal
  - b. Plausible if the student believes the 30.5 second time delay applies to P-8A
  - c. **CORRECT since P-8B is in AUTO with a standing AFAS Signal present and timer is timed out**
  - d. Plausible if the student does not recognize that the AFAS timer was started and timed out following the original AFAS actuation.
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Level of Knowledge: **HIGH**Difficulty: **4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2010 Audit Exam

K/A: 000055 Station Blackout / 6

EK3.02-Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions contained in EOP for loss of offsite and onsite power

Tier: 1      Group: 1      RO Imp: 4.3

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: TBCORE\_CK01.0 051

References: EOP-3.0 Basis, pages 18 and 19

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**Question:**

During a Station Blackout event, which one of the following is the preferred method of core heat removal during natural circulation cooling?

- a. Turbine Bypass Valve with PIC-0511, TBV Controller, in AUTO.
  - b. Atmospheric Dump Valves with HIC-0780A, Steam Dump Controller, in MANUAL.
  - c. Atmospheric Dump Valves with HIC-0780A, Steam Dump Controller, in AUTO.
  - d. Turbine Bypass Valve with PIC-0511, TBV Controller, in MANUAL.
- 
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**DISTRACTOR ANALYSIS**

- a. With a loss of power, there are no Cooling Tower Pps. or Condensate Pumps, and the resulting loss of Main Condenser vacuum will not allow use of the TBV.
  - b. **CORRECT**
  - c. The ADV controllers are not tuned for automatic mode during natural circ operations.
  - d. See explanation for 'a'.
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Level of Knowledge: **LOW**Difficulty: **3**

**WRITTEN QUESTION DATA SHEET**Source of Question: **NEW**

K/A: 000056 Loss of Off-site Power / 6

AA1.07-Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power: Service water pump

Tier: 1      Group: 1      RO Imp: 3.2

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: SWS\_CK24.0

References: PL-SWS, E-17 Sheet 4

Question:

Given the following with the Plant operating at full power:

- P-7A and P-7B, Service Water Pumps operating, P-7C in Standby
- Then a Reactor trip occurs due to a loss of P-50A, Primary Coolant Pump
- P-55B and P-55C, Charging Pumps, automatically start based on Pressurizer level control program
- Then, a loss of all off-site power occurs
  - 2400 VAC Buses 1C and 1D load shed
  - Both Diesel Generators start and loads are sequenced as designed
  - Pressurizer level is now 36%

Which one of the following describes the response of Service Water Pumps (P-7A,B,C) to the above event?

P-7A (1) be operating, P-7B (2) be operating, and P-7C (3) be operating after loads are sequenced onto 2400 VAC Buses 1C and 1D.

- a. (1) will not  
 (2) will  
 (3) will
- b. (1) will not  
 (2) will not  
 (3) will not
- c. (1) will  
 (2) will  
 (3) will not
- d. (1) will  
 (2) will  
 (3) will

**DISTRACTOR ANALYSIS**

- a. Plausible if student believes that only one Service Water pump will restart on each Diesel Generator
- b. Plausible if student believes that only the DBA Sequencer will restart the Service Water pumps
- c. Plausible if student believes standby pump does not restart
- d. **CORRECT Normal Shutdown Sequencers start all three SW Pumps following Load Shed**

Level of Knowledge: **HIGH**Difficulty: **2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 000057 Loss of Vital AC Inst. Bus / 6

AA2.08-Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus:  
Reactor power digital display and remote flux meterTier: 1      Group: 1      RO Imp: 3.4  
Applicable 10CFR55 Section: 41.6

Palisades Learning Objective: IOTF\_CK15.0

References: AOP-12, Attachment 1

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**Question:**

Which one of the following describes nuclear instrumentation that will not be available in the Control Room during a loss of EY-10, Preferred AC Bus?

- a. Power Range NI-06.
  - b. Source/Wide Range NI-2/4.
  - c. Source/Wide Range NI-1/3.
  - d. Power Range NI-05.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible, NI-06 is off of EY-20
  - b. Plausible, NI-2/4 is off of EY-40
  - c. Plausible, NI-1/3 is off of EY-30
  - d. **CORRECT, NI-05 is off of EY-10**
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Level of Knowledge: **LOW**Difficulty: **2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2010 ILT Exam RO Question #74

K/A: 000058 Loss of DC Power / 6

G2.4.3-Ability to identify post-accident instrumentation.

Tier: 1      Group: 1      RO Imp: 3.7

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBCORE\_CK05.0

References: FSAR Appendix 7C

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**Question:**

During a large break LOCA with a concurrent Loss of one train of DC power, the instruments most likely to be representative of actual Plant conditions have labels with a background color of ...

- a. black.
  - b. white.
  - c. brown.
  - d. blue.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible because there are instrument and component labels in the control room with this background color.
  - b. Plausible because there are instrument and component labels in the control room with this background color.
  - c. Plausible because there are instrument and component labels in the control room with this background color.
  - d. **CORRECT - Post accident instrumentation have labels that are blue.**
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Level of Knowledge: LOW

Difficulty: 2



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **MODIFIED 2013 RO Exam Question #17**

K/A: 000065 Loss of Instrument Air / 8

AA2.01-Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Cause and effect of low-pressure instrument air alarm

Tier: 1      Group: 1      RO Imp: 2.9  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF\_CK05.0

References: AOP-37, ARP-7 window 2; M-212 Sheet 1

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**Question:**

Given the following:

- The Plant is at full power
- A loss of Instrument Air occurs resulting in all three Instrument Air Compressors being in service
- EK-1102, "INSTRUMENT AIR LO PRESS", annunciator is in solid
- Instrument Air pressure is 78 psig and stable
- AOP-37, "Loss of Instrument Air" has been entered; NPOs have been dispatched to look for air leaks; no other Operator Actions have been taken
- A Nuclear Plant Operator reports:
  - FI-1210, Instrument Air Dryer M-2 Flow, indicates 210 cfm
  - F-12A, Instrument Air Dryer Pre-filter D/P, is 2 psid

Based on the above conditions, the most likely location of the air leakage is plant air header piping to .....

- a. VRS/Track Alley Fire Deluge System.
- b. Plant Intake Structure.
- c. Feedwater Purity Air Cross-Connect.
- d. West Engineered Safeguards Room.

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**DISTRACTOR ANALYSIS**

- a. Plausible if candidate incorrectly applies knowledge of plant air diagram and believes VRS/Track alley system located in the auxiliary building use instrument air, they utilize service air for the dry pipe system.
  - b. Plausible if candidate incorrectly applies knowledge of plant air diagram and believes the Intake Structure Area utilizes air after it comes out of the M-2 Air Dryer (specifically the SW Bay level indicators) however the area uses Service Air.
  - c. **CORRECT, FWP air crosstie ties into air main outlet header at air receiver tanks,**
  - d. Plausible if student incorrectly believes an air leak here would not result in excess flow through the Instrument Air Dryer.
- 
- 

Level of Knowledge: **HIGH**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: 2012 NRC ILT Exam RO Question #18

K/A: 000077 Generator Voltage and ElectricGrid Disturbances / 6

AA1.03-Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Voltage regulator controls

Tier: 1      Group: 1      RO Imp: 3.8

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: CAS\_CK16.0

References: SOP-19; ARP-7, windows 1, 2, and 3; P&ID M-212, sh. 1, 4

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**Question:**

Given the following with the Plant at full power:

- A voltage disturbance occurs on the Grid
- Main Generator reactive load changes from zero (0) MVARs to 300 MVARs IN
- Alarm EK-0303, "VOLTAGE REGULATOR LIMITER OPERATION," annunciates
- The Control Room team determines that the Minimum Excitation Limiter has actuated
- The Main Generator Voltage Regulator is then transferred to Direct Control (DC) in accordance with the associated Alarm Response Procedure

Which one of the following describes the impact of using the DC Regulator to maintain Main Generator terminal voltage?

- a. The Generator Loss of Field Relay (340) is blocked from actuating.
- b. The Volts/HZ Limiter Relay (395) is blocked from actuating.
- c. The Main Generator Capability curves are not valid.
- d. Automatic Voltage Regulator limits will not function.

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**DISTRACTOR ANALYSIS**

- a. Plausible because the 340 relay is blocked from actuating on certain malfunctions but not MEL.
  - b. Plausible because the student could believe that this is for exciter protection but it is actually generator protection.
  - c. Plausible because the MEL is described on the capability curves but the curves still apply.
  - d. **CORRECT**
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Level of Knowledge: **LOW**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 000005 Inoperable/Stuck Control Rod / 1

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.Tier: 1      Group: 2      RO Imp: 3.5  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBCORE\_CK01.0

References: EOP-1.0, EOP-3.0

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Question:

Given the following:

- A Station Blackout has occurred
- Reactor has tripped with three full length control rods not fully inserted
- Both Diesel Generators are operating and have failed to automatically load
- Both Steam Generator levels are at approximately -10% and lowering with no Auxiliary Feedwater flow

Which one of the following describes the procedurally required sequence for mitigating this event?

- a. (1) Emergency Borate.  
(2) Close D/G output breakers.  
(3) Start P-8B Auxiliary Feedwater Pump.
- b. (1) Start P-8B Auxiliary Feedwater Pump.  
(2) Close D/G output breakers.  
(3) Emergency Borate.
- c. (1) Emergency Borate.  
(2) Start P-8B Auxiliary Feedwater Pump.  
(3) Close D/G output breakers.
- d. (1) Close D/G output breakers.  
(2) Start P-8B Auxiliary Feedwater Pump.  
(3) Emergency Borate.

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**DISTRACTOR ANALYSIS**

- a. **CORRECT, Safety Function hierarchy dictates Reactivity Control (RC), Maintenance Vital Auxiliaries Electric (MVAE), and then PCS Heat Removal (HR)**
  - b. Plausible, incorrect order HR, MVAE, RC
  - c. Plausible, incorrect order RC, HR, MVAE
  - d. Plausible, incorrect order MVAE, HR, RC
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Level of Knowledge: **HIGH**Difficulty: **4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: 000028 Pressurizer Level Malfunction / 2

G2.4.45-Ability to prioritize and interpret the significance of each annunciator or alarm.

Tier: 1      Group: 2      RO Imp: 4.1  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAB\_E01.03

References: EOP-1.0, step 5

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**Question:**

Which one of the following would indicate an alarm/condition requiring a contingency action to be taken during the performance of EOP-1.0, "Standard Post Trip Actions"?

- a. EK-0546, "PREFERRED AC BUS NO 4 TROUBLE," annunciates and Preferred AC Bus EY-40 is de-energized.
- b. EK-1351, "CONTAINMENT SUMP HI LEVEL," annunciates and Containment Sump level indicates 585.5 feet and rising slowly.
- c. EK-0764, "PRESSURIZER LEVEL CH "B" LO LO" annunciates and Pzr level indicates 28% and lowering slowly.
- d. EK-0962, "STEAM GEN E-50A LO LEVEL," annunciates and 'A' Steam Generator level indicates 40% and stable.

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**DISTRACTOR ANALYSIS**

- a. Plausible but EOP-1.0 requires 3/4 Preferred AC buses and there are no contingency actions if more than one bus was lost.
- b. Plausible as this would indicate a PCS leak but there are no contingencies for sump level.
- c. **CORRECT**, EOP-1.0 requires contingency actions to be taken if pressurizer level not recovering.
- d. Plausible but contingency action is not required until 5%.

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**Level of Knowledge: HIGH****Difficulty: 2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **2013 NRC ILT RO Question #22**

K/A: 000032 Loss of Source Range NI / 7

AK3.01-Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Startup termination on source-range loss

Tier: 1      Group: 2      RO Imp: 3.2

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: NI\_E03.02

References: GOP-3, Step 5.2.1, 5.2.2

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Question:

Given the following:

- The Plant is in MODE 3
- GCL-3, "MODE 3  $\geq$  525F TO MODE 2," checklist is in progress with preparations for critical approach
- PCS boron concentration is 1080 PPM ( $\geq$  525°F, 2%  $\Delta \rho$ )
- Source Range/Wide Range channels NI-1/3 and NI-2/4 are in service
- Source Range NI Audible Counter selected to NI-2 is audible in Control Room
- Due to an equipment malfunction, power is lost to Source Range/Wide Range Channels NI-1/3

Based on the given plant conditions critical approach \_\_\_\_ (1) \_\_\_\_ continue due to \_\_\_\_ (2) \_\_\_\_.

- a. (1) may  
(2) Source Range NI Audible Counter remaining audible in Control Room
- b. (1) may not  
(2) less than required Source Range/Wide Range channels present
- c. (1) may  
(2) Source Range/Wide Range channels NI-2/4 remaining in service
- d. (1) may not  
(2) insufficient PCS boron concentration
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible if candidate believes that having the Source Range NI audible counter in service critical approach may continue.
- b. **CORRECT**
- c. Plausible if candidate believes that having the Source Range/Wide Range NI-2/4 in service critical approach may continue.
- d. Plausible if candidate believes that raising boron concentration would be a mitigating action for loss of the Source Range/Wide Range NI-1/3.
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Level of Knowledge: **LOW**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**K/A: **000036 Fuel Handling Accident / 8****AK2.02-Knowledge of the interrelations between the Fuel Handling Incidents and the following: Radiation monitoring equipment (portable and installed)**Tier: **1**      Group: **2**      RO Imp:      **3.4**Applicable 10CFR55 Section:      **41.7**Palisades Learning Objective: **IOTF\_CK01.0**References:      **E-17, sheet 7; ARP-7, window 26**

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**Question:**

Given the following with the Plant in MODE 6:

- Refueling operations are in progress
- Containment Refueling Monitors, RIA-2316 and RIA-2317, are in service

Which one of the following Control Room alarms, if any, will alert the Control Room team that RIA-2316 reached an alarm setpoint due to a fuel handling incident? (Assume that RIA-2317 has not reached an alarm setpoint)

- a. None, since RIA-2316 and RIA-2317 are both required to reach an alarm setpoint before a Control Room alarm is received.
  - b. EK-1366, "PLANT MONITORING HI RADIATION."
  - c. EK-1363, "CONTAINMENT HI RADIATION."
  - d. EK-1126, "CIS INITIATED."
- 
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**DISTRACTOR ANALYSIS**

- a. Plausible if the student misapplies the logic for CIS from the Refueling Monitors and believes that it is 2/2.
  - b. Plausible because various ARM systems initiate this alarm, however, RIA-2316 does not.
  - c. Plausible because this for a CHR when the plant is on-line, this is the alarm that will be received in addition to EK-1126, however, this alarm is initiated by the Containment Radiation Monitors.
  - d. **CORRECT** - When RIA-2316 alarms a containment isolation signal is initiated which causes EK-1126 to annunciate.
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**Level of Knowledge:      HIGH****Difficulty:      2**

**WRITTEN QUESTION DATA SHEET**Source of Question: **NEW**

K/A: 000059 Accidental Liquid RadWaste Rel. / 9

AA2.01-Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: The failure-indication light arrangement for a radioactive-liquid monitor

Tier: 1 Group: 2 RO Imp: 3.2

Applicable 10CFR55 Section: 43.5

Palisades Learning Objective: RMS\_CK08.0

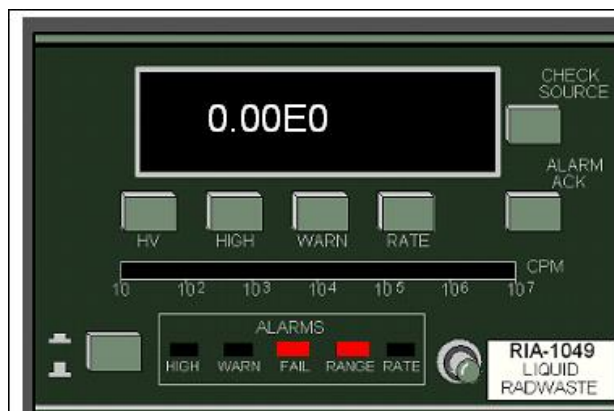
References: SOP-37, Attach. 1, ARP-8, Window 71, SOP-17C

**Question:**

Given the following conditions:

- T-91 Utility Water Tank batch is in progress
- RIA-1049, Radwaste Discharge Monitor has been setup per SOP-37, Process Liquid Monitor System and the Batch Card
- The 3" Radwaste Discharge line is in use per SOP-17B, Dirty Radwaste System
- Two Dilution Water Pumps are in service

During the batch release, annunciator EK-1371, "RADIATION MONITOR SYSTEM CKT FAILURE" alarms and the NCO observes the indications seen below on RIA-1049, Radwaste Discharge Monitor.



Based on the above conditions, RIA-1049, Radwaste Discharge Monitor \_\_\_\_ (1) \_\_\_\_ and \_\_\_\_ (2) \_\_\_\_ can serve as a backup to the other release Process Liquid Monitors for this batch release.

- (1) counts have just gone off-scale low  
(2) RIA-5211, Turbine Building Sump Monitor
- (1) counts have been off-scale low for > five minutes  
(2) RIA-5211, Turbine Building Sump Monitor
- (1) counts have just gone off-scale low  
(2) RIA-1323, Circulating Water Discharge Monitor
- (1) counts have been off-scale low for > five minutes  
(2) RIA-1323, Circulating Water Discharge Monitor

**DISTRACTOR ANALYSIS**

- Plausible if candidate does not recognize the Rate Meter fail light has a five minute time delay and believes the batch release flowpath goes through the Turbine Building Sump
- Plausible if candidate recognizes Rate Meter failure criteria and incorrectly assumes flowpath.
- Plausible if candidate does not recognize the Rate Meter fail light has a five minute time delay but does recognize correct flowpath.
- CORRECT, Range light is on due to counts off-scale low with proper Rate Meter indication. Fail light is on due to time delay satisfied.**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 000061 ARM System Alarms / 7

AK2.01-Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms and the following: Detectors at each ARM system location

Tier: 1      Group: 2      RO Imp: 2.5

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: RMS\_CK06.0

References: SOP-24, 4.3.3, rev 36

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Question:

Given the following conditions:

- The Plant is at full power
- Train 'A' of Control Room HVAC is in service in Normal mode
- The following alarm annunciates:
  - EK-0239, "CRHVAC TRAIN A RIA-1818A HI RAD/FAIL"
- It is determined that RIA-1818A has failed and is INOPERABLE

What are the consequences of continuing to operate the Control Room HVAC system in these conditions?

- a. If a CHP/CHR occurs, Train 'A' CRHVAC only will fail to automatically swap to Emergency mode.
- b. If a CHP/CHR occurs, neither CRHVAC train will automatically swap to Emergency mode.
- c. Any radioactive contamination entering the Control Room from the outside will not be detected.
- d. Train 'A' CRHVAC automatically swaps to Purge mode and the Control Room depressurizes.

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**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes the RIA is associated with CHP/CHR actuation.
  - b. Candidate incorrectly believes the RIA is associated with CHP/CHR actuation.
  - c. **CORRECT - This radiation monitor is in the air flow path for CRHVAC normal ops.**
  - d. Candidate misapplies an automatic action from the RIA. There are NO auto actuations from the RIA.
- 
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Level of Knowledge: LOW

Difficulty: 2



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: 000074 Inad. Core Cooling / 4

EK3.11-Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling:  
Guidance contained in EOP for Inadequate Core Cooling

Tier: 1      Group: 2      RO Imp: 4.0

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: TBCORE\_CP02.0

References: EOP 9.0, HR-2, Step 69, HR-2 SFSC

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Question:

Given the following:

- The Plant has experienced a loss of coolant accident inside Containment
- On the Rx Trip, two full length Control Rods remained fully withdrawn
- EOP 9.0 "Functional Recovery Procedure" has been implemented
- Containment Spray and Safety Injection actuated as designed
- When SI Pump throttling criteria were satisfied the following actions were taken:
  - The four HPSI Train 2 Loop MOVs were closed
  - P-66A, HPSI Pump, was secured
  - The four HPSI Train 1 Loop MOVs were throttled
  - P-55B and P-55C, Charging Pumps, were secured
- Pressurizer level currently is 46% and slowly rising
- At some time later, 2400 VAC Bus 1C de-energizes and is subsequently automatically reenergized by D/G 1-1

For the above conditions, which one of the following describes the additional operator actions, if any, necessary for ensuring the PCS/Core Heat Removal Safety Function Status Checks are met.

- a. Start HPSI Pump P-66A.
- b. Fully open the four HPSI Train 1 Loop MOVs.
- c. Start HPSI Pump P-66B.
- d. None, Safety Injection is currently providing adequate flow.

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**DISTRACTOR ANALYSIS**

- a. Plausible, student believes inadequate HPSI flow exists and starting pump solves problem.
- b. Plausible, student believes HPSI pump will start but the HPSI loop MOVs will not open fully.
- c. Plausible, student believes the DBA sequencer will not start pump.
- d. **CORRECT - DBA sequencer will start P-66B and fully open associated loop MOVs.**

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Level of Knowledge: **HIGH**Difficulty: **4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: CE/A16 Excess RCS Leakage / 2

AA1.2-Ability to operate and / or monitor the following as they apply to the (Excess RCS Leakage): Operating behavior characteristics of the facility.

Tier: 1      Group: 2      RO Imp: 3.0

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: IOTF\_CK01.0

References: AOP-23

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**Question:**

Given the following with the Plant is in MODE 3:

- Pressurizer pressure 2060 psia
- PCS temperature is 532°F
- T-3, Component Cooling Water (CCW) Surge Tank, level is rising 2% per minute
- Counts on RIA-0915, CCW Radiation Monitor, are rising

Which one of the following would indicate that the potential source of PCS leakage into the CCW System for these conditions is from P-50A, Primary Coolant Pump?

P-50A ...

- a. lower seal pressure rises to PCS pressure.
- b. lower seal temperature rises by 10°F.
- c. cooling water outlet temperature lowers by 10°F.
- d. lower seal temperature lowers by 10°F.

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**DISTRACTOR ANALYSIS**

- a. Plausible because this is a partial indication of a seal stage failure.
  - b. **CORRECT**
  - c. Plausible but PCS water would cause the CCW temperature to rise.
  - d. Plausible but temperature would rise because no CCW is entering the PCS side of the seal.
- 
- 

Level of Knowledge: HIGH

Difficulty: 4

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: CE/E09 Functional Recovery

EA2.2-Ability to determine and interpret the following as they apply to the (Functional Recovery): Adherence to appropriate procedures and operation within the limitations in the Facility's license and amendments.

Tier: 1      Group: 2      RO Imp: 3.5

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF\_CK05.0

References: IOTF Lesson Plan; AOP-2

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Question:

The following Plant conditions were observed:

- Containment pressure has risen one (1) psig in the last three minutes
- Containment temperature 135°F and rising
- PCS pressure 2000 psia and lowering
- PCS subcooling rising
- Pressurizer level lowering
- Reactor power 102% and rising
- RIA-2323, 'B' S/G Main Steam Line Monitor and RIA-0631 Condenser Off-Gas Monitor count rate is rising

Based on the above stated conditions what actions are required to be taken?

- a. Reduce reactor power to less than 100% and enter AOP-23, "Primary Coolant Leakage."
  - b. Reduce reactor power to less than 100% and enter AOP-2, "Excessive Load."
  - c. Trip the reactor, enter EOP-1.0, "Standard Post-Trip Actions", then enter EOP-6.0, "Excessive Steam Demand Event."
  - d. Trip the reactor, enter EOP-1.0, "Standard Post-Trip Actions", then enter EOP-9.0 "Functional Recovery Procedure."
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**DISTRACTOR ANALYSIS**

- a. Plausible if student believes containment ambient conditions and Pressurizer parameters indicate primary Coolant System leakage into Containment.
  - b. Plausible if student recognizes ESDE inside Containment and believes that Rx trip criteria have not yet been exceeded.
  - c. Plausible if student recognizes ESDE inside Containment, and fails to recognize the SGTR in 'B' S/G
  - d. **CORRECT, per EOP-1.0 Safety Function Status Checks, multiple events are in progress (ESDE + SGTR) requiring transition to EOP-9.0**
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Level of Knowledge: HIGH

Difficulty: 4

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **MODIFIED 2008 ILT RO Question #29**

K/A: 003 Reactor Coolant Pump

K5.05-Knowledge of the operational implications of the following concepts as they apply to the RCPS: The dependency of RCS flow rates upon the number of operating RCPs

Tier: 2      Group: 1      RO Imp: 2.8

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: SPS\_CK13.0

References: ARP-03, EK-0302, EK-0308

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Question:

Given the following conditions:

- The Plant is at full power
- A severe thunderstorm is in progress
- An undetermined transient causes the following to occur:
  - Plant trip
  - An overcurrent fault condition on 4160VAC Bus 1B

Which of the items below completes the following sentence?

Assuming no additional malfunctions and all other equipment functions as designed, (1) Primary Coolant pumps will be operating and PCS flowrate will be (2).

- a. (1) all  
(2) unchanged
- b. (1) only P-50A and P-50C  
(2) lowered by 50%
- c. (1) only P-50B and P-50D  
(2) lowered by 50%
- d. (1) no  
(2) lowering to establish Natural Circulation

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student believes that A and B bus will fast transfer to S/U XFMR 1-1
  - b. **CORRECT, 'A' Bus will fast transfer to S/U Transformer 1-1**
  - c. Plausible if the student misapplies power supplies for PCPs
  - d. Plausible if the student believes the fault will trip 'R' Bus in the Switchyard
- 
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Level of Knowledge: **HIGH**Difficulty: **4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 004 Chemical and Volume Control

K2.03-Knowledge of bus power supplies to the following: Charging Pumps

Tier: 2      Group: 1      RO Imp: 3.3

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CVCS\_CK07.0

References: SOP-2A

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**Question:**

Given the following:

- The Plant is in MODE 3 with  $T_{AVE}$  at 532°F
- A loss of 2400 V Bus 1D occurs
- Pressurizer level is 38% with Level Control in CASCADE

Which one of the following describes the Charging Pumps that are expected to be operating due to the above conditions?

- a. P-55A and P-55C.
  - b. P-55C only.
  - c. P-55B and P-55C.
  - d. P-55B only.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible if student misapplies power supplies and recognizes demand for increased charging flow.
  - b. **CORRECT, Although PLCS is calling for increased charging flow, only pump P-55C has power available**
  - c. Plausible if student misapplies power supplies and recognizes demand for increased charging flow.
  - d. Plausible if student misapplies power supplies for charging pumps.
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- 

Level of Knowledge: LOW

Difficulty: 2

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 004 Chemical and Volume Control

K6.09-Knowledge of the effect of a loss or malfunction on the following CVCS components: Purpose of VCT divert valve

Tier: 2      Group: 1      RO Imp: 2.8

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CVCS\_CK02.0

References: ARP-4, Window 9

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**Question:**

Given the following conditions:

- The Plant is in MODE 3
- Chemical Volume Control System is lined up for normal operation
- Pressurizer Level is 42% and stable
- EK-0709, "VOLUME CONTROL TANK HI-LO LEVEL," annunciates
- VCT Level is 97% and slowly rising

Which one of the following describes the possible cause of this condition and the action that will properly restore VCT Level?

- a. Tube rupture in Regenerative Heat Exchanger, E-56. Close Letdown Isolation Valve CV-2001 and secure Charging Pump, P-55A.
- b. MO-2160, SIRWT to Charging Pumps, inadvertently opens. Close MO-2160 and start Charging Pump P-55B or P-55C.
- c. Tube rupture in Regenerative Heat Exchanger, E-56. Close Letdown Orifice Stop Valves, CV-2003, 2004 and 2005 and close Letdown Isolation Valve CV-2001.
- d. MO-2160, SIRWT to Charging Pumps, inadvertently opens. Close MO-2160 and place CV-2056, Letdown to VCT or VDT, in the "To Clean Waste Receiver Tanks" position.

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student correctly believes that Charging Pump discharge pressure higher than Letdown pressure results in VCT level increase, however securing all charging is incorrect and will result in securing all Letdown flow.
  - b. Plausible if student believes double charging will lower VCT level however Pzr level setpoint is 42% for this condition and double charging will cause Pzr level to rise.
  - c. Plausible if student believes proper action is to secure all letdown to VCT.
  - d. **CORRECT**
- 

Level of Knowledge: **HIGH**Difficulty: **4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 005 Residual Heat Removal

A1.01-Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RHRS controls including: Heatup/cooldown rates

Tier: 2      Group: 1      RO Imp: 3.5

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: SDC\_E05.02

References: SOP-3, AOP-30, **Attachment 1 (MUST BE PROVIDED)**, GOP-14

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Question:

Given the following conditions:

- The Reactor Cavity is flooded to 629'
- It is day 15 of a scheduled Refueling Outage
- Current bulk PCS temperature is 120°F

A request to temporarily secure Shutdown Cooling flow for a valve test has been approved by the Operations Manager. Assuming Shutdown Cooling flow is terminated at 0320, flow must be restored prior to:

- a. 0335.
  - b. 0340.
  - c. 0350.
  - d. 0420.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Incorrect: Plausible if candidate uses incorrect curves or data points.
  - b. Incorrect: Plausible if candidate uses incorrect curves or data points.
  - c. **Correct, Using AOP-30, Attachment 1, page 10. 30 minutes to heat up 20 degrees.**
  - d. Incorrect: Plausible if candidate uses incorrect curves or data points.
- 
- 

Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 005 Residual Heat Removal

G2.4.35-Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.

Tier: 2      Group: 1      RO Imp: 3.8  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAE\_E02.01

References: EOP 7.0, Step 45

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**Question:**

The Plant tripped due to a loss of Offsite Power complicated by a loss of all feedwater. EOP-7.0 is the in-use procedure. Following the restoration of feed to the S/Gs, the PCS was cooled down further to establish Shutdown Cooling entry conditions. The following conditions exist:

- PCS pressure is 260 psia as read on PI-0104
- Pressurizer level is 42% and charging and letdown flow is matched
- 1-1 D/G and 1-2 D/G are operating normally. Buses 1C and 1D are energized
- Y01 is being supplied by MCC-2. MCC 1 is faulted and de-energized
- PCS THs and Qualified CETs are reading 285°F ± 5°F
- MO-3015 and MO-3016, Shutdown Cooling from PCS Isolations, are closed

Which one of the following actions must be completed before Shutdown Cooling may be placed in service?

- a. Remove Control Power fuses from non-operating Primary Coolant Pumps to prevent inadvertent pump start.
- b. Make a containment entry and manually open MO-3015.
- c. Establish one Offsite Power source from either the 'F' or 'R' Bus.
- d. Establish solid PCS conditions per SOP 1A and stop charging and letdown.

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**DISTRACTOR ANALYSIS**

- a. Plausible if candidate believes Primary Coolant Pumps must be disabled prior to Shutdown Cooling entry
  - b. **CORRECT, Only MO-3016 has power for operation.**
  - c. Plausible if candidate believes Diesel Generators will not support SDC operations
  - d. Plausible if candidate misapplies sequencing of PCP securing, PCS solid plant operation, and SDC entry
- 
- 

Level of Knowledge: HIGH

Difficulty: 4



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: 006 Emergency Core Cooling

A2.08-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: Effect of electric power loss on valve position

Tier: 2      Group: 1      RO Imp: 3.0

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF\_CK15.0

References: AOP-14 step 4, AOP-9

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**Question:**

Given the following:

- The Plant was at full power when an automatic Reactor trip occurs
- Bus 1D de-energizes and subsequently loads on to 1-2 Diesel Generator
- Preferred AC Bus EY-30 is de-energized

Assuming all other equipment responds as designed, which one of the following correctly completes the following statement?

If a valid SIAS signal were to occur, then (1).

The NCO will manually operate the (2) per EOP Supplement 5, "Checklist for Safeguards Equipment Following SIAS."

- a. (1) neither channel of SIS equipment will automatically operate.  
(2) left channel equipment
- b. (1) only the right channel SIS equipment will automatically operate.  
(2) left channel equipment
- c. (1) neither channel of SIS equipment will automatically operate.  
(2) right channel equipment
- d. (1) only the left channel SIS equipment will automatically operate.  
(2) right channel equipment

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student believes that a loss of either EY-30 or EY-40 will affect both SIS Actuation Channels
  - b. **CORRECT**
  - c. Plausible if the student believes that a loss of either EY-30 or EY-40 will affect both SIS Actuation Channels
  - d. Plausible if the student incorrectly applies the power supplies to the appropriate SIS Actuation channel
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Level of Knowledge: **HIGH**Difficulty: **2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2009 ILT Audit RO Question #34

K/A: 007 Pressurizer Relief/Quench Tank

K4.01 - Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: Quench Tank Cooling

Tier: 2      Group: 1      RO Imp: 2.6  
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PCS\_CK02.0

References: DBD 2.04, page 64; M-201, sheet 2

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**Question:**

With the Plant in MODE 3 and the PCS at normal operating pressure and temperature, a Pressurizer Relief Valve lifts. Which one of the following describes how the steam discharged into the Quench Tank from the relief valve is cooled and the location to which the Quench Tank is subsequently drained?

- a. Steam from the relief valve enters the Quench Tank via a spray nozzle and is cooled by Primary Makeup Water in the tank. The Quench Tank is then drained to the Containment Sump.
  - b. Steam from the relief valve enters the Quench Tank via a spray nozzle and is cooled by Primary Makeup Water in the tank. The Quench Tank is then drained to T-74, Primary System Drain Tank.
  - c. Steam from the relief valve enters the Quench Tank via an underwater sparger and is cooled by Primary Makeup Water in the tank. The Quench Tank is then drained to the Containment Sump.
  - d. Steam from the relief valve enters the Quench Tank via an underwater sparger and is cooled by Primary Makeup Water in the tank. The Quench Tank is then drained to T-74, Primary System Drain Tank.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Student confuses the PMU entrance flow path with relief valve discharge flow path and believes that the water is drained to the containment sump.
  - b. Student confuses the PMU entrance flow path with relief valve discharge flow path.
  - c. Student believes that the water is drained to the containment sump.
  - d. **CORRECT**
- 
- 

Level of Knowledge: **LOW**Difficulty: **2**

**WRITTEN QUESTION DATA SHEET**Source of Question: **BANK**K/A: **007 Pressurizer Relief/Quench Tank****A3.01-Ability to monitor automatic operation of the PRTS, including: Components which discharge to the PRT**Tier: **2** Group: **1** RO Imp: **2.7**Applicable 10CFR55 Section: **41.7**Palisades Learning Objective: **PCS\_CK09.0**References: **ARP-4; EOP-4.0****Question:**

The Plant was manually tripped from full power prior to exceeding TMLP trip setpoints.

- PCS pressure is 950 psia and continues to lower
- Quench Tank pressure is 0 psig and 95% level
- RVLMS shows a bubble in the Reactor Vessel Head with the four top red lights illuminated
- SIS and CHP have actuated
- The Acoustic Monitor Panel continues to alarm

The following alarms have annunciated:

- EK-0702, "RELIEF VALVE 2006 DISCH HI TEMP"
- EK-0744, "PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP"
- EK-0761, "PRESSURIZER LEVEL HI-LO"
- EK-0769, "PRESSURIZER LEVEL HIGH"
- EK-0731, "QUENCH TANK HI TEMP"
- EK-0732, "QUENCH TANK HI PRESS"
- EK-0733, "QUENCH TANK HI-LO LEVEL"

The NCO isolated Letdown following CHP. Which one of the following describes what has happened and explains the above conditions?

- a. RV-2006 (Letdown HX E-58 Inlet Safety Relief) lifted and continues to discharge to the Quench Tank.
- b. RV-1039 (Pressurizer Safety Relief) has lifted momentarily and reseated since Quench Tank pressure is zero (0) psig.
- c. RV-1039 (Pressurizer Safety Relief) lifted, remains open and the Quench Tank rupture disk has ruptured.
- d. RV-1039 (Pressurizer Safety Relief) lifted and the pipe downstream of the RV ruptured immediately.

**DISTRACTOR ANALYSIS**

- a. **INCORRECT:** The Letdown Relief RV-2006 lifted following CHP isolation of Letdown. Operator actions to close the Letdown orifices allow the RV to reseat. Even if the RV did not seat, following isolation of Letdown by closing the Letdown Orifices, the event would be over if this was the only reason for the loss of coolant. Also, RV-2006 cannot explain the conditions existing in Pressurizer and Reactor Head.
- b. **INCORRECT:** PCS pressure would not continue to lower and the Reactor Head bubble would not exist if RV-1039 had only lifted momentarily and then reseated.
- c. **CORRECT: The Quench Tank Rupture Disk blows at 100 psig. Tank contains sufficient water volume to condense total steam mass released during a 112% to 0% reactor power swing (assumes no letdown or pressurizer spray). Normal pressure is 3 psig. The conditions in the stem are indicative of a continuing LOCA that has not been isolated. If the leak was isolated PCS pressure would be higher riding on HPSI injection pressure.**
- d. **INCORRECT:** If the pipe downstream of RV-1039 failed immediately following the RV lift, the Quench Tank would not have ruptured as it is designed to quench the steam mass released during a 112% to 0% reactor power swing (assumes no letdown or pressurizer spray).

Level of Knowledge: **HIGH**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 008 Component Cooling Water

A2.01-Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of CCW pump

Tier: 2      Group: 1      RO Imp: 3.3

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: CCW\_CK10.0

References: DBD-1.01, ARP-7 window 68

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**Question:**

The Plant is at full power with all equipment in the normal configuration when the following occurs:

- A loss of off-site power coincident with a Safety Injection Actuation
- Both D/Gs start and sequence loads per design

Two minutes later, CCW Pump, P-52B, trips with a resultant CCW header pressure of 68 psig.

Which one of the following describes the effect on CCW Pump, P-52C, and the appropriate action to take?

- Will auto start. Verify P-52C discharge pressure >115 psig.
  - Will auto start. Check for excessive loading on D/G 1-1.
  - Will not auto start. Ensure acceptable loading on D/G 1-1 and manually start P-52C.
  - Will not auto start. Reduce CCW loads to avoid a runout condition on P-52A.
- 

**DISTRACTOR ANALYSIS**

- INCORRECT – P-52C will not auto start. Plausible if the student believes that the DBA sequencer start signal and the low pressure signal do not need to be present at the same time. 115 psig is the discharge pressure limit for 2 pump operation per SOP-16.
  - INCORRECT – P-52C will not auto start. . Plausible if the student believes that the DBA sequencer start signal and the low pressure signal do not need to be present at the same time. Two CCW pumps running on one EDG could make loading on the EDG high.
  - CORRECT – The DBA sequencer will start P-52C only if pressure at the time of sequence (40 seconds) is < 80#.**
  - INCORRECT – Plausible if the student believes that starting P-52C is not the right action due to EDG loading concerns.
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Level of Knowledge: HIGH

Difficulty: 4

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **MODIFIED BANK Q#3337**

K/A: 008 Component Cooling Water

A4.03-Ability to manually operate and/or monitor in the control room: Throttling of the CCW pump discharge valve

Tier: 2      Group: 1      RO Imp: 2.7  
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBCORE\_CK02.0

References: EOP-3.0, EOP Supplement 24

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**Question:**

Given the following conditions:

- A Station Blackout occurred 25 minutes ago
- The Control Room team is performing the actions of EOP-3.0 "Station Blackout Recovery"
- Prior to starting the first CCW Pump after restoring power, the pump discharge valve is throttled such that the valve is two (2) turns open

Which one of the following describes the reason for throttling the CCW Pump discharge valve?

- a. Prevent the pump from tripping on overcurrent.
  - b. Prevent thermal shock to the Containment Air Coolers.
  - c. Minimize hydraulic shock to the system.
  - d. Prevent CCW pump runout.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible, however the basis for the action is to minimize thermal and hydraulic shock to components cooled by CCW.
  - b. Plausible if student incorrectly believes that the Containment Air Coolers are cooled by CCW. SWS is the normal cooling water supply to the CACs
  - c. **CORRECT**
  - d. Plausible, same as a above
- 
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**Level of Knowledge: HIGH****Difficulty: 2**

**WRITTEN QUESTION DATA SHEET**Source of Question: **NEW**

K/A: 010 Pressurizer Pressure Control

K2.03-Knowledge of bus power supplies to the following: Indicator for PORV position

Tier: 2      Group: 1      RO Imp: 2.8

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: IOTF\_CK04.0

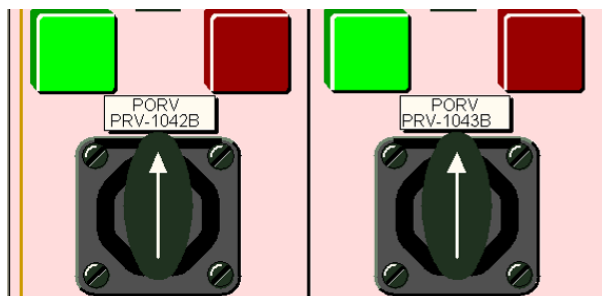
References: AOP-17, Attachment 11, pg 3

**Question:**

Given the following Plant conditions:

- The Plant is in MODE 3 performing a cooldown for a forced outage
- Two Primary Coolant Pumps are in operation
- LTOP has been placed in service
- Then, a loss of 125V DC Bus ED-21-1 occurs

Which one of the following describes the status of the Green position indication light for the PORVs for the above plant conditions? (use picture below for reference only)



- a. (1) PRV-1042B: off  
(2) PRV-1043B: off
- b. (1) PRV-1042B: off  
(2) PRV-1043B: on
- c. (1) PRV-1042B: on  
(2) PRV-1043B: off
- d. (1) PRV-1042B: on  
(2) PRV-1043B: on

**DISTRACTOR ANALYSIS**

- a. Plausible if the student believes that both PORV position indications are powered from ED-21-1.
- b. Plausible if the student believes that PRV-1042B position indication is powered from ED-21-1.
- c. **CORRECT, loss of ED-21-1 deenergizes light for PRV-1043B.**
- d. Plausible if the student believes that neither PORV position indication is powered from ED-21-1.

Level of Knowledge: **LOW**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: 010 Pressurizer Pressure Control

G2.4.50-Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Tier: 2      Group: 1      RO Imp: 4.2

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBCORE\_CK03.0

References: ARP-4, Window 55; EOP-5.0, Step 5

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Question:

Given the following:

- The Plant has experienced a LOCA inside Containment
- EOP-4.0, "Loss of Coolant Accident Recovery" is in use
- Pressurizer Level indicates 33% and lowering
- Digital Pressurizer Pressure (on PI-0104) indicates 1610 psia
- The following alarms have annunciated:
  - EK-0755, "PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS"
  - EK-0757, "PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS"

Based on the above conditions, which one of the following describes:

1. The expected Plant response
  2. Operator Actions to be taken
    - a. (1) All Pressurizer Heaters de-energized  
(2) Re-energize Pressurizer Heaters per ARP-4, "Primary System Volume Level Pressure Scheme EK-07"
    - b. (1) Annunciator EK-1342, "SAFETY INJ ACTUATED" alarming  
(2) Verify Safety Injection actuated per EOP-4.0, "Loss Coolant Accident Recovery"
    - c. (1) Annunciator EK-1369, "SAFETY INJECTION SIGNAL BLOCK PERMIT" alarming  
(2) Block Safety Injection Actuation per ARP-8, "Safeguards Safety Injection and Isolation Scheme EK-13"
    - d. (1) Only Pressurizer Heaters powered from Bus 1E, de-energized  
(2) Re-energize Pressurizer Heaters per EOP Supplement 5, "Checklist For Safeguards Equipment Following SIAS"
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible due to low level in Pzr during LOCA tripping heaters at 36%. Incorrect procedure for restoration. In-use EOP and/or SOP-30 would be used to restore heaters
  - b. **CORRECT, 2/4 logic on Pzr Press Lo-Lo actuates SIAS at 1605psia**
  - c. Plausible if candidate fails to recognize 2/4 actuation logic satisfied based on annunciators
  - d. Plausible if candidate recognizes SIAS de-energizes E Bus heaters and fails to recognize Pzr low level should have tripped ALL heaters.
- 
- 

Level of Knowledge: **HIGH**Difficulty: **3**

**WRITTEN QUESTION DATA SHEET**Source of Question: **BANK**

K/A: 012 Reactor Protection

A4.06-Ability to manually operate and/or monitor in the control room: Reactor trip breakers

Tier: 2 Group: 1 RO Imp: 4.3

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: RPS\_CK27.0

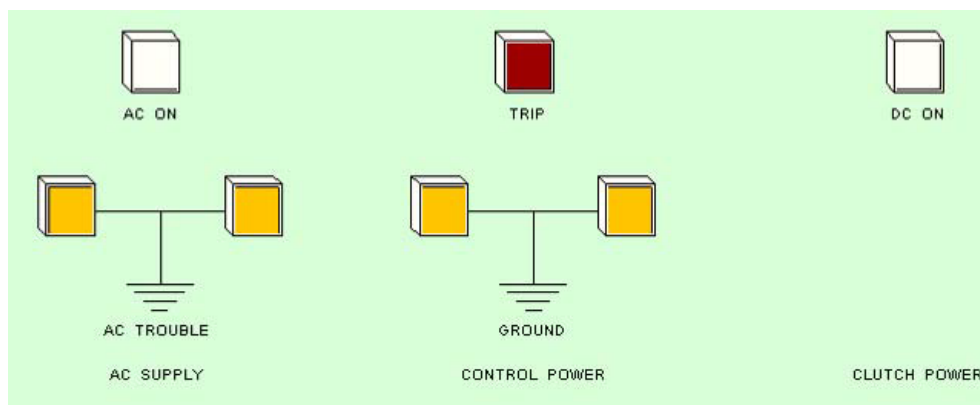
References: Drawing M1Q-114

Question:

With the Plant at full power the following occurs:

- Main Turbine trips due to a low vacuum condition, but reactor does not automatically trip
- NCO attempts to trip the reactor using the pushbutton on Panel C-02, are unsuccessful
- The NCO then successfully trips the reactor using the pushbutton on Panel C-06

Based on the above conditions, which one of the following describes the status of Reactor Trip Breakers, 42-1RPS and 42-2RPS and the Red RPS "Trip" Light on the CRDM Clutch Power Supply drawers on panel C-06? (refer to picture of a Clutch Power Supply drawer below)



- 42-1RPS and 42-2RPS are CLOSED.  
Red RPS "Trip" light is OFF.
- 42-1RPS and 42-2RPS are CLOSED.  
Red RPS "Trip" light is LIT.
- 42-1RPS and 42-2RPS are TRIPPED.  
Red RPS "Trip" light is OFF.
- 42-1RPS and 42-2RPS are TRIPPED.  
Red RPS "Trip" light is LIT.

**DISTRACTOR ANALYSIS**

- The student misapplies the method of trip from C-06 and believes that the Red RPS "Trip" light will not light if the C-06 method is used.
- The student correctly applies that the Red RPS "Trip" light will light but misapplies the method of reactor trip from C-06.
- The student correctly applies the method of reactor trip from C-06 but believes that the Red RPS "Trip" light will not light if the C-06 method is used.
- CORRECT**

Level of Knowledge: **HIGH**Difficulty: **3**



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 013 Engineered Safety Features Actuation

A3.01-Ability to monitor automatic operation of the ESFAS, including: Input channels and logic

Tier: 2      Group: 1      RO Imp: 3.7

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: SIS\_CK08.0

References: SOP-3, 7.3.2.d.d

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**Question:**

Which one of the following actions must be taken to prevent P-67A, LPSI Pump, from tripping while on Shutdown Cooling?

- a. Place the appropriate RAS SIRW TNK LOW/CNTMT SUMP RECIRC switch on C-13 to RESET.
- b. Place the appropriate RAS SIRW TNK LOW/CNTMT SUMP RECIRC switch on C-13 to TEST.
- c. Ensure the TRIP ON LOW LEVEL IN SIRW TNK switch on C-03 is in ENABLE.
- d. Place the appropriate TRIP ON LOW LEVEL IN SIRW TNK switch on C-03 to DEFEAT.

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**DISTRACTOR ANALYSIS**

- a. Plausible, if the student believes this action will remove the LPSI pump trip signal.
- b. Plausible, if the student believes this action will remove the LPSI pump trip signal.
- c. Plausible, if the student believes this action will maintain the LPSI pump in operation
- d. **CORRECT**

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**Level of Knowledge:      LOW****Difficulty:      2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 022 Containment Cooling

A2.04-Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of Service Water

Tier: 2      Group: 1      RO Imp: 2.9  
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: CAIR\_CK13.0

References: TS 3.6.6 AND TS 3.6.1

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**Question:**

Given the following:

- The Plant is at full power
- EK-1346, "CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL " has alarmed
- When CV-0869 (VHX-4 service water inlet valve) is closed, the alarm clears
- CV-0869 (VHX-4 service water inlet valve) is left closed

Based upon these conditions, which one of the following completes the following statement?

LCO 3.6.1.A, "Containment" (1) required to be entered and LCO 3.6.6.A, "Containment Cooling Systems" (2) required to be entered.

- a. (1) is  
(2) is
- b. (1) is  
(2) is not
- c. (1) is not  
(2) is
- d. (1) is not  
(2) is not

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**DISTRACTOR ANALYSIS**

- a. INCORRECT. VHX-4 is not safety related. Containment Operability is impacted due to potential leak path via the service water system.
- b. **CORRECT. VHX-4 is not safety related therefore Containment Cooling is not impacted after the leak is isolated. Containment Operability is impacted due to potential leak path via the service water system.**
- c. INCORRECT. VHX-4 is not safety related. Containment Operability is impacted due to potential leak path via the service water system.
- d. INCORRECT. VHX-4 is not safety related. Containment Operability is impacted due to potential leak path via the service water system.
- 

Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 026 Containment Spray

K2.01-Knowledge of bus power supplies to the following: Containment spray pumps

Tier: 2 Group: 1 RO Imp: 3.4

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBCORE\_CK03.0

References: E-1, sheet 1; E-17, sheet 3 and 4

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**Question:**

Given the following with a Plant cooldown in progress:

- Safety Injection has been blocked
- Then, a loss of coolant accident coincident with a loss of offsite power occurs
- Containment pressure reaches 4.5 psig
- 1-1 Diesel Generator starts and sequences loads as designed
- 1-2 Diesel Generator will not start

Which one of the following describes the HPSI pump(s) and Containment Spray Pump(s) that will be operating due to this event? (Assume no operator actions occur)

- a. P-54B and P-54C only.
- b. P-66B and P-54B and P-54C only.
- c. P-66A and P-54A only.
- d. P-54A only.

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student believes that P-66B will not start because SIS is blocked.
  - b. **CORRECT**
  - c. Plausible if the student believes P-66A and P-54A are powered from C bus.
  - d. Plausible if the student believes that HPSI will not start because SIS is blocked and P-54A is powered from C bus.
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Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 039 Main and Reheat Steam

K4.02-Knowledge of MRSS design feature(s) and/or interlock(s) which provide for the following: Utilization of T-ave. program control when steam dumping through atmospheric relief/dump valves, including T-ave. limits

Tier: 2      Group: 1      RO Imp: 3.1  
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: MSS\_CK10.02 002

References: DBD 1.09, section 3.2.2.2

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**Question:**

Which one of the following statements describes the expected response of the Atmospheric Steam Dump Valves (ADV) and the Turbine Bypass Valve (TBV) immediately following a reactor trip from 60% power?

- ADV's Quick open and then modulate closed and are full closed when  $T_{AVE}$  is  $\leq 540^{\circ}\text{F}$ ;  
TBV Quick opens and then modulates closed as S/G pressure approaches 895 psia.
  - ADV's Quick open and then modulate closed and are full closed when  $T_{AVE}$  is  $\leq 535^{\circ}\text{F}$ ;  
TBV Quick opens and then modulates closed as S/G pressure approaches 895 psia.
  - ADV's modulate open and then modulate closed and are full closed when  $T_{AVE}$  is  $\leq 535^{\circ}\text{F}$ ;  
TBV modulates open and then modulates closed as S/G pressure approaches 895 psia.
  - ADV's modulate open and then modulate closed and are full closed when  $T_{AVE}$  is  $\leq 540^{\circ}\text{F}$ ;  
TBV modulates open and then modulates closed as S/G pressure approaches 895 psia.
- 
- 

**DISTRACTOR ANALYSIS**

- incorrect because at 60% power  $T_{AVE}$  is not high enough to cause a quick open signal to be generated.
  - incorrect because at 60% power  $T_{AVE}$  is not high enough to cause a quick open signal to be generated.
  - CORRECT**
  - incorrect because the ADVs do not fully close until  $T_{AVE}$  reaches  $\leq 532^{\circ}\text{F}$  per DBD-1.09 figure 3.2-2.
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Level of Knowledge: HIGH

Difficulty: 4

**WRITTEN QUESTION DATA SHEET**

Source of Question: **NEW**

K/A: 059 Main Feedwater

K3.02-Knowledge of the effect that a loss or malfunction of the MFW will have on the following: AFW System

Tier: 2      Group: 1RO Imp: 3.6  
 Applicable 10CFR55 Section: 41.7

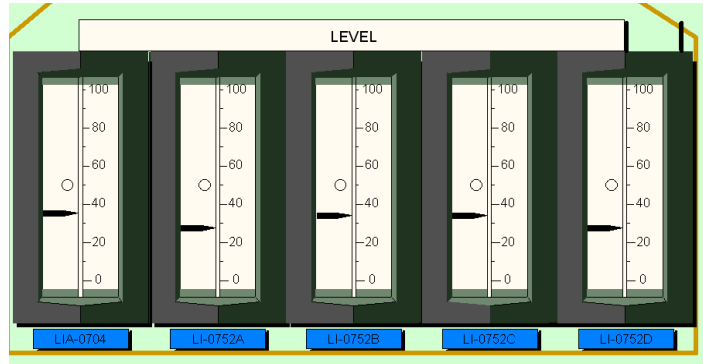
Palisades Learning Objective: TBAB\_E01.03

References: SOP-12, EOP-1.0, Step 3

**Question:**

Given the Plant operating at full power when an unexpected Plant trip occurs.

Assuming all systems operated as expected and given the following indications for 'B' Steam Generator level:



Which one of the following describes the expected status of the (1) Main Feedwater and (2) the Auxiliary Feedwater Systems?

- a. (1) Main Feed Reg Valve Controller (LIC-0703) in "Manual" with output signal frozen "as-is"  
 (2) AFW Pump (P-8A) running with AFW flow at 165gpm to each Steam Generator
- b. (1) Main Feed Reg Valve Controller (LIC-0703) in "Auto" with output signal at 100%  
 (2) AFW Pump (P-8C) running with AFW flow at 165gpm to each Steam Generator
- c. (1) Main Feed Reg Valve Controller (LIC-0703) in "Manual" with output signal frozen "as-is"  
 (2) AFW Pump (P-8A) running with AFW flow at 165gpm to 'B' Steam Generator only.
- d. (1) Main Feed Reg Valve Controller (LIC-0703) in "Auto" with output signal at 100%  
 (2) AFW Pump (P-8C) running with AFW flow at 165gpm to 'B' Steam Generator only

**DISTRACTOR ANALYSIS**

- a. **CORRECT**
- b. Plausible, if candidate fails to recognize FRV position fails "as-is" with controller in manual. Also does not recognize P-8A is first AFW Pump to start.
- c. Plausible if candidate confuses AFAS actuation results with MSIS actuation results.
- d. Plausible if candidate fails to recognize FRV position fails "as-is" with controller in manual, and candidate believes that AFAS only feeds one Steam Generator.

**WRITTEN QUESTION DATA SHEET**Source of Question: **BANK**

K/A: 059 Main Feedwater

A4.08-Ability to manually operate and monitor in the control room: Feed regulating valve controller

Tier: 2      Group: 1      RO Imp: 3.0

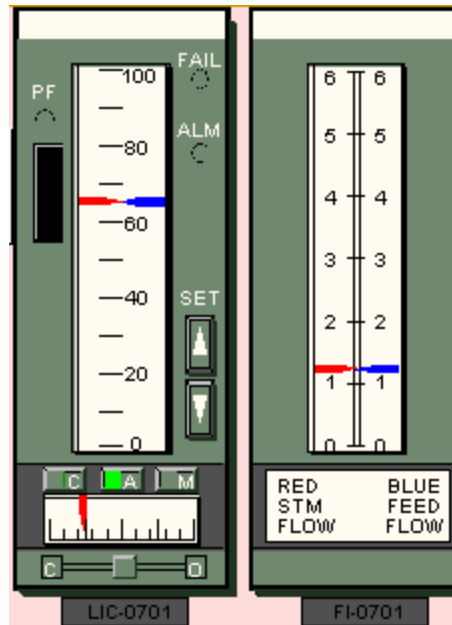
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: **SGWL\_CK02.0**

References: E-17, sheet 9

**Question:**

The Plant is at 25% power with the Main Feedwater Regulating Valves being controlled in automatic. A major Steam Generator tube rupture then occurs in the 'A' Steam Generator (S/G). Which one of the following describes the indications on the 'A' S/G Feedwater Regulating Valve Controller LIC-0701/FI-0701 with no operator action?



- Output signal rising on LIC-0701 and Feed flow lowering on FI-0701.
- Output signal lowering on LIC-0701 and Feed flow stable on FI-0701.
- Output signal rising on LIC-0701 and Feed flow stable on FI-0701.
- Output signal lowering on LIC-0701 and Feed flow lowering on FI-0701.

**DISTRACTOR ANALYSIS**

- Incorrect, output signal lowers.
- Incorrect, feed flow lowers.
- Incorrect, feed flow and output signal lower.
- CORRECT**

Level of Knowledge: **HIGH**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **MODIFIED BANK #3036**

K/A: 061 Auxiliary/Emergency Feedwater

K4.01-Knowledge of AFW design feature(s) and/or interlock(s) which provide for the following: Water sources and priority of use

Tier: 2      Group: 1      RO Imp: 4.1

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBAE\_E01.02

References: EOP-7.0 Step 8

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**Question:**

Given that EOP-7.0, "Loss of All Feedwater" is in progress and the following Plant conditions:

- Loss of offsite power has occurred
- Condensate Storage Tank T-2 has ruptured, level is 0%
- All other plant equipment operated as designed

Which one of the following describes the preferred method of S/G inventory replenishment in prioritized order in accordance with EOP-7.0?

- a. AFW from Service Water via P-8C.
  - b. AFW from Service Water via P-8A or P-8B.
  - c. AFW from Fire Water via P-8C.
  - d. AFW from Fire Water via P-8A or P-8B.
- 
- 

**DISTRACTOR ANALYSIS**

- a. **CORRECT**
  - b. Plausible, incorrect due to piping connection only available to Firewater from P-8A/B
  - c. Plausible, incorrect due to piping connection only available to Service Water from P-8C
  - d. Plausible, correct but lower listed priority
- 
- 

**Level of Knowledge: HIGH****Difficulty: 3**

**WRITTEN QUESTION DATA SHEET**Source of Question: **NEW**

K/A: 061 Auxiliary/Emergency Feedwater

A1.05-Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: AFW flow/motor amps

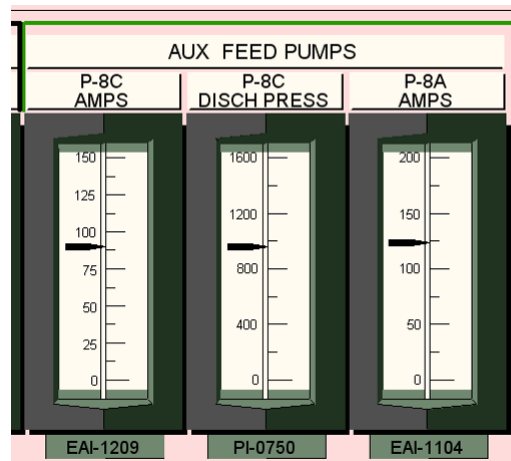
Tier: 2      Group: 1      RO Imp: 3.6  
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: AFW\_CK13.0

References: SOP-12 section 7.1.1 and 7.3.1

**Question:**

The Plant has just tripped from full power and EOP-1.0, "Standard Post Trip Actions," are currently in progress. The NCO Turbine observes that both AFW Pumps P-8A and P-8C are operating. Which one of the following describes the AFW Pump(s), if any, which would be considered to be exceeding procedural limits (refer to picture below)



- P-8A only.
- P-8C only.
- P-8A and P-8C.
- Neither P-8A or P-8C.

**DISTRACTOR ANALYSIS**

- CORRECT, P-8A amp limit is 112 amps, P-8C limit is 99 amps.**
- Plausible if the student believes that P-8C amps limit is exceeded.
- Plausible if the student believes that both P-8A and P-8C amps limit are exceeded
- Plausible if the student believes that neither AFW pump amp limit is exceeded.

Level of Knowledge: **LOW**Difficulty: **3**



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 062 AC Electrical Distribution

K3.02-Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: ED/G

Tier: 2      Group: 1      RO Imp: 4.1

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: EDG\_CK16.0.g, EDG\_CK08.0

References: E-4, sheet 1; E-5, sheet 3

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**Question:**

With the Plant operating at normal full power conditions, Bus 13 (LCC-13) develops an overcurrent condition and the incoming breaker 52-1302 trips. Which one of the following describes the effect on Diesel Generator 1-1? D/G 1-1 will experience a loss of ....

- a. power to room heater, VUH-27.
  - b. alternate power to supply fans, V-24A/B.
  - c. alternate power to starting air compressor, C-3A.
  - d. power to pre-lube pump, P-905A.
- 
- 

**DISTRACTOR ANALYSIS**

- a. INCORRECT – Plausible if the student believes that the room heater is powered from LCC-13.
  - b. **CORRECT**
  - c. INCORRECT – Plausible because there is an alternate method of obtaining starting air if the normal power supply to the air compressor, C-3A, is lost. This method, however, is to use a gasoline engine.
  - d. INCORRECT – Plausible if the student believes that the pre-lube pump is powered from LCC-13.
- 
- 

**Level of Knowledge:      LOW****Difficulty:                      2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 063 DC Electrical Distribution

K2.01-Knowledge of bus power supplies to the following: Major DC loads

Tier: 2      Group: 1      RO Imp: 2.9

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: **EPS\_CK11.0**References: **AOP-17, attachment 1**

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**Question:**

The Plant is operating at full power with Battery Chargers #3 and #4 in service. The DC Bus #1 Tie Breaker, 72-10, trips open. Which one of the following describes the loads, if any, which will be de-energized?

- a. EY-10, ED-11-1, and ED-11-2.
- b. EY-10 only.
- c. None.
- d. EY-30 only.

---

**DISTRACTOR ANALYSIS**

- a. Plausible if the student mistakes which Battery Charger supplies 125VDC Buses ED-10R and ED-10L
- b. Plausible if the student mistakes which Inverter is powered from 125VDC Buses ED-10R and ED-10L
- c. **CORRECT**, ED-10R will be energized from the Station Batteries while ED-10L will remain energized from Battery Charger #3
- d. Plausible if the student believes that tripping 72-10 DC Tie Breaker will DE-energize ED-10L and EY-30

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**Level of Knowledge: HIGH****Difficulty: 4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **MODIFIED 2010 RO Audit Question #50**

K/A: 064 Emergency Diesel Generator

K1.02-Knowledge of the physical connections and/or cause-effect relationships between the ED/G system and the following systems: ED/G cooling water system

Tier: 2      Group: 1      RO Imp: 3.1

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: EDG\_CK10.0

References: ARP-20A windows 3, 4, 9, 15

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**Question:**

Given that Diesel Generator (D/G) 1-1 is operating in Parallel at full load for monthly surveillance testing, which one of the following conditions will cause the D/G to automatically trip?

- a. Hot Jacket Water temperature indicates 200°F.
  - b. Jacket Water Pressure indicates 9 psig.
  - c. Hot Lube Oil temperature indicates 215°F.
  - d. Lube Oil pressure indicates 42 psig.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible since this is above limit (195°F) for declaring D/G inoperable
  - b. **CORRECT, trip setpoint is  $\leq 10$  psig for  $>45$  seconds**
  - c. Plausible since this is above limit (205°F) for declaring D/G inoperable
  - d. Plausible student recalls that the D/G will trip but at  $\leq 40$  psig.
- 
- 

**Level of Knowledge:      LOW****Difficulty:              3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 073 Process Radiation Monitoring

K3.01-Knowledge of the effect that a loss or malfunction of the PRM system will have on the following:  
Radioactive effluent releasesTier: 2      Group: 1      RO Imp: 3.6  
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: RMS\_E03.01 005

References: SOP-18A, 7.5.e

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**Question:**

T-101B, Waste Gas Decay Tank, batch release is planned, but RIA-1113, Waste Gas Discharge Monitor, is INOPERABLE. For this condition, which one of the following is one of the actions that must be taken to allow T-101B to be released?

- a. Setup local portable monitoring equipment at the release point.
  - b. Perform a source check of RIA-2326, Normal Range Stack Gas Monitor.
  - c. Perform an independent verification of the discharge flowpath lineup.
  - d. Verify Wind Speed at 60 meters on the PPC MET Data Page is at least 10 mph.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible since local monitoring used in other loss of rad monitoring conditions
  - b. Plausible, student believes stack gas monitor is alternate for RIA-1113
  - c. **CORRECT**
  - d. Plausible since this would disperse release.
- 
- 

Level of Knowledge: **LOW**Difficulty: **2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2012 ILT Audit RO Question 52

K/A: 076 Service Water

K3.01-Knowledge of the effect that a loss or malfunction of the SWS will have on the following: Closed cooling water

Tier: 2      Group: 1      RO Imp: 3.4

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CCW\_CK11.0

References: M-209, SH 2

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**Question:**

If the Service Water system failed, all of the following components would lose their backup cooling availability except:

- a. P-54A/B/C Containment Spray Pumps.
  - b. P-8C Auxiliary Feedwater Pump.
  - c. P-66A/B HPSI Pumps.
  - d. P-67 A/B LPSI Pumps.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Incorrect: SW is backup cooling supply to CSS Pumps
  - b. **CORRECT - P-8C is located in West Engineered Safeguards and used to be a spare HPSI Pump**
  - c. Incorrect: SW is backup cooling supply to HPSI Pumps
  - d. Incorrect: SW is backup cooling supply to LPSI Pumps
- 
- 

Level of Knowledge: LOW

Difficulty: 2

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 078 Instrument Air

K4.01-Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control

Tier: 2      Group: 1      RO Imp: 2.7

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CAS\_CK08.0

References: SOP-19 section 7.1.1.d note

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Question:

Given the following:

- • Instrument Air Compressor, C-2A, is in operation in HAND
- • Instrument Air Compressor, C-2C, is in AUTO
- • Instrument Air Compressor, C-2B, is removed from service for maintenance
- • An air leak develops on the discharge of C-2A causing air pressure to lower to 85 psig
- • C-2A subsequently trips
- • The air leak is then isolated by closing the discharge of C-2A

How will C-2C respond to this instrument air pressure transient?

C-2C will ...

- a. auto start but will not load unless air pressure lowers to 80 psig.
- b. auto-start and load. Will unload when pressure reaches 105 psig, will load again if pressure lowers to 85 psig.
- c. auto-start and load. Will unload when pressure reaches 105 psig, will load again if pressure lowers to 95 psig.
- d. auto-start and load. Will run fully loaded regardless of air pressure until placed in OFF and returned to AUTO.

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student misapplies the auto start feature of the standby air compressor.
  - b. Plausible if the student confuses the setpoint for auto closure of service air automatic isolation with the standby compressor loading setpoint.
  - c. **CORRECT - C-2C will auto start since it is in standby and will unload and load at 105 and 95 psig, respectively.**
  - d. Plausible if the student believes that the air compressor does not load/unload when in standby.
- 
- 

Level of Knowledge: HIGH

Difficulty: 2

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 103 Containment

2.4.20-Knowledge of the operational implications of EOP warnings, cautions, and notes.

Tier: 2      Group: 1      RO Imp: 3.8

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: SIS\_CK02.0

References: EOP Supplement 42, Pg. 8 CAUTION

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**Question:**

Given the following conditions:

- A Large Break LOCA event is in progress
- Safety Injection Signal (SIS) and Containment High Pressure (CHP) signals are received and all equipment operates as designed
- A Recirculation Actuation Signal (RAS) is received and all equipment functions as designed with the exception of CV-3029, Containment Sump Isolation to East Safeguards, which does not open

Which one of the following describes (1) required action(s) for this condition and (2) the reason?

- a. (1) Stop P-54A, Containment Spray Pump and P-66A, HPSI Pump.  
(2) P-54A will operate in a runout condition. P-66A has lost its suction source.
- b. (1) Stop P-54A, Containment Spray Pump only.  
(2) P-54A will operate in a runout condition. P-66A suction is aligned to the remaining operating Spray Pumps discharge.
- c. (1) Stop P-54A, Containment Spray Pump and P-66A, HPSI Pump.  
(2) P-54A and P-66A have lost their suction source.
- d. (1) Stop P-54A, Containment Spray Pump only.  
(2) P-54A has lost its suction source; P-66A suction is aligned to the remaining operating Spray Pumps discharge.

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**DISTRACTOR ANALYSIS**

- a. Plausible because the student misapplies the reason. If only one spray pump is operating, operators are directed to trip one HPSI pump. Student also misapplies the flow path for HPSI pump subcooling because they think that the HPSI pump will lose all suction if the Sump outlet does not open.
- b. Plausible because the student misapplies the reason. If only one spray pump is operating, operators are directed to trip one HPSI pump.
- c. Student misapplies the flow path for HPSI pump subcooling because they think that the HPSI pump will lose all suction if the Sump outlet does not open.
- d. **CORRECT**

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**Level of Knowledge: HIGH****Difficulty: 4**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: 001 Control Rod Drive

K1.02-Knowledge of the physical connections and/or cause-effect relationships between the CRDS and the following systems: CVCS

Tier: 2      Group: 2      RO Imp: 3.6

Applicable 10CFR55 Section: 41.5, 41.10

Palisades Learning Objective: RTA\_E02.06

References: EN-RE-327, GOP-3

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**Question:**

Given the following conditions:

- A reactor startup is being performed
- The Estimated Critical Position calls for Group 4 rods to be at 30 inches at criticality
- Criticality is actually achieved with Group 3 rods at 6 inches

Which one of the following correctly describes (1) the actions required for the above plant conditions, and (2) the reason this action is required?

- a. (1) Insert all regulating rod groups to their lower electrical limit and emergency borate.  
(2) Control Rod position is below PDIL limit.
  - b. (1) Trip the Reactor and emergency borate.  
(2) Control Rod position is below PDIL limit.
  - c. (1) Insert all regulating rod groups to their lower electrical limit only.  
(2) Control Rod position is outside the limitations of the critical prediction.
  - d. (1) Trip the Reactor only.  
(2) Control Rod position is outside the limitations of the critical prediction.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible, reason is correct but action does not require emergency boration
  - b. **Correct - Criticality achieved below Group 3 PDIL and emergency boration is required.**
  - c. Plausible, action is correct but the reason is incorrect
  - d. Plausible, if student believes that tripping the Reactor meets SDM requirements, however reason is incorrect.
- 
- 

Level of Knowledge: **HIGH**Difficulty: **2**



**WRITTEN QUESTION DATA SHEET**Source of Question: **NEW**

K/A: 002 Reactor Coolant

K6.04-Knowledge of the effect of a loss or malfunction on the following RCS components: RCS vent valves

Tier: 2      Group: 2      RO Imp: 2.5

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PRV\_E01.03

References: SOP-1A Attachment 12

**Question:**

Given the Plant is at full power. The Control Room Team has determined that excessive PCS leakage may be occurring from one of the valves in the Reactor Head/Pressurizer Vent System. Which one of the following describes the valve(s), if any, that may be stroked to attempt valve reseating in accordance with SOP-1A, "Primary Coolant System?"

- |    |   |  |
|----|---|--|
|    | <u>PRV-1071, Vent Valve<br/>to Containment Atmosphere</u> | <u>PRV-1072, Vent Valve to<br/>Quench Tank</u> |
| a. | Can be stroked  | Can be stroked                                 |
| b. | Can <u>not</u> be stroked                                 | Can <u>not</u> be stroked                      |
| c. | Can be stroked  | Can <u>not</u> be stroked                      |
| d. | Can <u>not</u> be stroked                                 | Can be stroked                                 |

**DISTRACTOR ANALYSIS**

- CORRECT.**
- Plausible if the student believes that neither Vent Valves can be stroked.
- Plausible if the student believes that only PRV-1071 can be stroked.
- Plausible if the student believes that only PRV-1072 can be stroked.

Level of Knowledge: **LOW**Difficulty: **3**

**WRITTEN QUESTION DATA SHEET**Source of Question: **MODIFIED BANK 2007 ILT Exam RO Q#56**

K/A: 011 Pressurizer Level Control

K3.01-Knowledge of the effect that a loss or malfunction of the PZR LCS will have on the following: CVCS

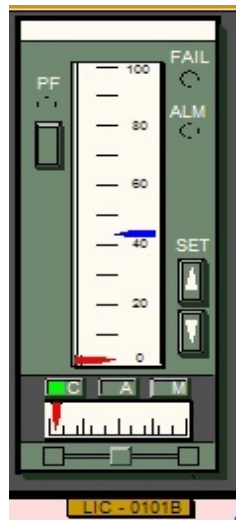
Tier: 2      Group: 2      RO Imp: 3.2  
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PLCS\_CK11.0

References: AOP-22, Tech. Spec. 3.4.9

**Question:**

With the Plant at full power, a failure on the in-service PZR Level Controller (LIC-0101B) occurs,(see below picture of LIC-0101B). The operator must take corrective action to address which one of the following concerns?



- Pressurizer LOW level with potential de-energization of all Pressurizer heaters.
- Pressurizer HIGH level with the potential to exceed Technical Specifications for level.
- Pressurizer HIGH level with potential to exceed alarm setpoint for high pressure.
- Pressurizer LOW level with the potential to exceed Technical Specifications for level.

**DISTRACTOR ANALYSIS**

- INCORRECT – Plausible if the student believes that the failure of the controller will result in an actual low PZR level. Actual level is rising due to the response of the PLCS.
- CORRECT, Actual Pressurizer level is lowering due to response of the CVCS to PLCS and there is a TS Limit for high level.**
- INCORRECT – Plausible if the student believes the rising Pzr level will result in high pressure before exceeding level limits.
- INCORRECT – Plausible if the student believes that the failure of the controller will result in an actual low PZR level. Plausible if the student believes that there is a tech spec limit for PZR low level.

Level of Knowledge: **HIGH**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: 014 Rod Position Indication

K4.01-Knowledge of RPIS design feature(s) and/or interlock(s) which provide for the following: Upper electrical limit

Tier: 2      Group: 2      RO Imp: 2.5

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CRD\_E02.02

References: TS 3.1.4 Bases pg B3.1.4-5 (top of page, end of LCO discussion)

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**Question:**

Which one of the following provides the signal to operate the red (Upper Electrical Limit) Control Rod Matrix lights for the Shutdown Control Rods on Panel C-12.

- a. Limit switch geared to the rod drive motor.
- b. Primary Position Indication (PIP) system.
- c. Synchro geared to the rod drive motor.
- d. Secondary Position Indication (SPI) system.

---

**DISTRACTOR ANALYSIS**

- a. Plausible if the student confuses the limit switches which are cam-operated from the control rod synchro shaft with the magnetic reed switches which are the secondary Position Indication and not geared to the drive motor.
- b. Plausible if the student believes the PIP system is the magnetic reed switches instead of the synchro transmitter geared to the clutch output shaft.
- c. Plausible if the student believes the synchro transmitters are geared to the rod drive motors rather than the clutch output shafts.
- d. **CORRECT, the Secondary Position Indication is a string of magnetic reed switches fastened to the outside of the CRDM Pressure Housing**

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**Level of Knowledge: LOW****Difficulty: 3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 015 Nuclear Instrumentation

G2.4.6-Knowledge of EOP mitigation strategies.

Tier: 2      Group: 2      RO Imp: 3.7

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBCORE\_CK01.0

References: EOP-9.0 Basis for RC-1, p. 40 of 104, rev. 16

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**Question:**

Given the following conditions:

- The Plant was at 89% power when an accident occurred which required a manual reactor trip
- Three (3) control rods will not insert into the core
- The Control Room team is implementing EOP-9.0, "Functional Recovery Procedure" and have chosen Success Path RC-1 for Reactivity Control

If all Wide Range Nuclear Instruments have become INOPERABLE, what is the effect, if any, on the NCO's ability to check the status of the Reactivity Control safety function?

- a. No effect, since Reactivity Control is satisfied due to Xenon building in for the next approximately 10-12 hours.
  - b. Reactivity Control must be satisfied by manually driving down one of the stuck control rods.
  - c. Will need to check Reactor power at less than 100cps and constant or lowering using the Source Range NIs.
  - d. Will need to check Reactor power at less than 2% using Delta T power indication.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible, Xenon will be building in however Xenon concentration cannot be monitored directly.
  - b. Plausible, however Reactivity Control Safety Function status is confirmed with Nuclear Instrumentation.
  - c. **CORRECT - This method is prescribed by the Functional Recovery procedure.**
  - d. Plausible, however incorrect required compensatory monitoring method.
- 
- 

Level of Knowledge: **HIGH**Difficulty: **3**

## WRITTEN QUESTION DATA SHEET

Source of Question: BANK

K/A: 016 Non-nuclear Instrumentation

K5.01-Knowledge of the operational implication of the following concepts as they apply to the NNIS: Separation of control and protection circuits

Tier: 2 Group: 2 RO Imp: 2.7

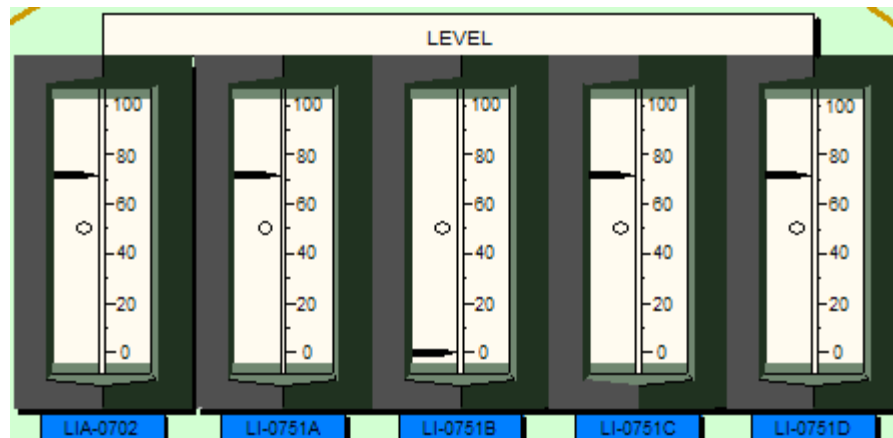
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: SGWL\_CK13.0

References: ARP-5, window 61; FSAR 7.2, page 7.2-2, 7.2-9

Question:

Refer to the below graphic of 'A' Steam Generator level instrumentation.



The Plant is at 100% power. RPS Channel B for 'A' Steam Generator Low Level is BYPASSED due to a failure of LI-0751B.

Which one of the following additional instrument failures will result in a Reactor trip? (Assume no operator action.)

- LI-0751A fails low.
- LI-0751A fails high.
- LIA-0702 fails low.
- LIA-0702 fails high.

## DISTRACTOR ANALYSIS

- INCORRECT – Plausible because there are now 2 channels that feed the RPS that exceed a setpoint, however, a trip will not be processed because RPS channel 'B' is bypassed.
- INCORRECT – Plausible because there are now 2 channels that feed the RPS that exceed a setpoint, however, RPS channel 'B' is bypassed and there is no RPS trip for high S/G level.
- INCORRECT - Plausible if the student believes there are now two inputs to RPS that exceed a setpoint, however, RPS channel 'B' is bypassed and LIA-0702 does not provide an input to RPS.
- CORRECT** – If LIA-0702 fails high, the feed regulating valve associated with 'A' S/G would close which would cause an actual low level condition. An RPS trip would be generated from the remaining 3 channels that are not bypassed.

Level of Knowledge: HIGH

Difficulty: 3

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2010 RO Audit Question #59

K/A: 017 In-core Temperature Monitor

K6.01-Knowledge of the effect of a loss or malfunction of the following ITM system components: Sensors and detectors

Tier: 2      Group: 2      RO Imp: 2.7

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PCS\_CK20.0

References: SOP-34 Section 4.2.3; LCO 3.3.7; SOP-34, attachment 5

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**Question:**

Given the following with the Plant in MODE 3:

- PCS temperature is 532°F
- PCS pressure is 2060 psia

Then, the following occurs:

- Qualified Core Exit Thermocouple #2 (CET #2) indication in Quadrant #1 fails
- Qualified CET #2 will not indicate on the PPC or Panel C-11A

For these conditions, which one of the following describes the status of LCO 3.3.7, "Post Accident Monitoring Instrumentation," and the reason for the status?

- a. LCO 3.3.7 is met since the other three Quadrant #1 readings are available on Panel C-11A.
  - b. LCO 3.3.7 is met since the other three Quadrant #1 readings are available on the PPC.
  - c. LCO 3.3.7 is not met since only three Quadrant #1 readings are available.
  - d. LCO 3.3.7 is not applicable in MODE 3.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible, student believes only need 3 quadrant readings required on recorders.
  - b. Plausible, student believes only need 3 quadrant readings required on PPC.
  - c. **CORRECT**
  - d. Plausible, student believes LCO not applicable in MODE 3.
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Level of Knowledge: HIGH

Difficulty: 4

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2012 AuditExam RO Question #61

K/A: 033 Spent Fuel Pool Cooling

A1.01-Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Spent Fuel Pool Cooling System operating the controls including: Spent fuel pool water level

Tier: 2      Group: 2      RO Imp: 2.7

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF\_CK07.0

References: AOP-25

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**Question:**

Given the following with the Plant in MODE 6:

- Reactor Cavity water level is 647' 2"
- Door-950, Spent Fuel Pool (SFP) South Tilt Pit Gate, is removed
- EK-1309, "SPENT FUEL POOL HI/LO LEVEL", alarm annunciates
- The Control Room team confirms that the alarm is due to a low level in the SFP
- The Control Room Supervisor implements AOP-25, "Loss of Refueling Water Accident"

Which one of the following conditions requires tripping the in-service SFP Cooling Pump?

- a. Alarm EK-1308, "FUEL POOL CLG PUMPS DISCH LO PRESS", annunciates.
  - b. RIA-2313, Spent Fuel Pool Criticality Monitor, alarms.
  - c. Spent Fuel Pool temperature indicates greater than 108°F.
  - d. Spent Fuel Pool temperature rises uncontrollably.
- 
- 

**DISTRACTOR ANALYSIS**

- a. **CORRECT**
  - b. Plausible because this is the criteria for evacuating the area; student applies this to pump trip criteria.
  - c. Plausible because this is the temperature at which action must be taken to minimize cavitation of the in service spent fuel pool cooling pump; student applies this to pump trip criteria
  - d. Plausible because this is the criteria for requiring addition of water to the SFP from external sources; student applies this to pump trip criteria.
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Level of Knowledge: **LOW**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **NEW**

K/A: 071 Waste Gas Disposal

A2.09-Ability to (a) predict the impacts of the following malfunctions or operations on the Waste Gas Disposal System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Stuck-open relief valve

Tier: 2      Group: 2      RO Imp: 3.0

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: ISEE\_CK16.0

References: M-211 Sheets 2 and 3, ARP-8 windows 64 and 68, ARP-9 window 30

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**Question:**

Given the Plant is shutdown for a forced outage. A Nuclear Plant Operator reports that the relief valve on Waste Gas Decay Tank T-68A was inadvertently bumped by a vendor and appears to be stuck open. T-68A was recently isolated at 95 psi per SOP-18A, "Radioactive Waste System - Gaseous." Which one of the following describes (1) the Control Room alarm, if any, that will occur and (2) the action required to mitigate the event?

- a. (1) EK-1364, "GASEOUS WASTE MONITORING HI RADIATION."  
(2) Start selected Waste Gas Compressor (C-50A, C-50B or C-54).
  - b. (1) EK-1368, "RADWASTE PANEL C-40 OFF NORMAL."  
(2) Start selected Waste Gas Compressor (C-50A, C-50B or C-54).
  - c. (1) EK-1364, "GASEOUS WASTE MONITORING HI RADIATION."  
(2) Close CV-1123, Waste Gas Decay Tank to Stack.
  - b. (1) EK-1368, "RADWASTE PANEL C-40 OFF NORMAL."  
(2) Close CV-1123, Waste Gas Decay Tank to Stack.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible if the student assumes that Waste Gas Decay Tank Relief valves discharge to stack through the rad monitor. The action would be incorrect for that assumption.
  - b. **CORRECT.**
  - c. Plausible if the student believes 'a' above is correct and therefore needs to isolate flowpath to stack.
  - d. Plausible for a combination of 'a' and 'c' above, and incorrectly believes that the rad monitor is an input to annunciator EK-1368 instead of EK-1364.
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Level of Knowledge: **HIGH**Difficulty: **4**



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 079 Station Air

A4.01-Ability to manually operate and/or monitor in the control room: Cross-tie valves with IAS

Tier: 2      Group: 2      RO Imp: 2.7

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: **CAS\_CK10.0**References: M-212 sheet 1; ARP-7 window 2

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**Question:**

The following conditions exist:

- Instrument Air Compressor C-2A control switch is in HAND
- Instrument Air Compressors C-2B and C-2C control switches are in AUTO
- Instrument Air Header pressure is currently 95 psig and lowering

If Instrument Air header pressure continues to lower, which one of the following describes the response of the Instrument Air System?

CV-1212, Service Air Isolation Valve, will close when pressure ....

- a. UPSTREAM of the filter and dryer reaches 85 psig.
  - b. DOWNSTREAM of the filter and dryer reaches 85 psig.
  - c. UPSTREAM of the filter and dryer reaches 88 psig.
  - d. DOWNSTREAM of the filter and dryer reaches 88 psig.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible if location of PS-1210 is misapplied.
  - b. **CORRECT**
  - c. Plausible if location of PS-1210 is misapplied and pressure setpoint confused with recent Compressor Auto Start pressures.
  - d. Plausible if pressure setpoint confused with recent Compressor Auto Start pressures.
- 
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**Level of Knowledge:      LOW****Difficulty:              2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: G2.1.20-Ability to interpret and execute procedure steps.

Tier: 3      Group:      RO Imp: 4.6  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAM\_CK08.0

References: AOP-41

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**Question:**

AOP-41, "Alternate Safe Shutdown Procedure," contains the following step:

☀ 15. VERIFY Bus 1C OR Bus 1D is energized.

The symbol "☀" indicates this step....

- a. must be performed in the Control Room.
  - b. must be performed locally.
  - c. is continuously applicable.
  - d. has emergency lighting provided.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Plausible distracter.
  - b. Plausible distracter.
  - c. Plausible distracter.
  - d. **CORRECT**
- 
- 

**Level of Knowledge:      LOW****Difficulty:      2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: G2.1.44-Knowledge of RO duties in the control room during fuel handling such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.

Tier: 3      Group:      RO Imp:      3.9  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTD\_E02.02

References: AP 4.02

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**Question:**

A fuel bundle has just been transferred from the core to the Spent Fuel Pool. Per Admin 4.02, "Control of Equipment." Which one of the following is normally responsible for tracking the location of the fuel bundle?

- a. Control Room Supervisor.
- b. Nuclear Control Operator.
- c. Shift Engineer.
- d. Reactor Engineer.

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**DISTRACTOR ANALYSIS**

- a. Plausible if student believes this is an Operations Department responsibility
  - b. Plausible if student believes this is an Operations Department responsibility
  - c. Plausible if student believes this is an Operations Department responsibility
  - d. **CORRECT, Fuel Status Boards are normally maintained accurately and up-to-date by Reactor Engineering**
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Level of Knowledge: LOW

Difficulty: 2

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: G2.2.12-Knowledge of surveillance procedures.

Tier: **3**      Group:      RO Imp:      **3.7**  
Applicable 10CFR55 Section:      **41.5**Palisades Learning Objective: **APCO\_E18.04**References:      **DWO-1, attachment 9**

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**Question:**

A manual Heat Balance Calculation is being performed per DWO-1, "Operators Daily/Weekly Items MODES 1, 2, 3, 4." Which one of the following conditions will cause calculated Heat Balance Power to be greater than actual Heat Balance Power?

- Blowdown flow used in the calculation is greater than actual blowdown flow.
- Steam Generator (S/G) pressure used in the calculation is less than actual S/G pressure.
- Feedwater flow used in the calculation is less than actual feedwater flow.
- UFM Correction Factor used in the calculation is less than actual UFM Correction Factor.

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**DISTRACTOR ANALYSIS**

- Plausible, student misapplies the factor that blowdown has on the HB equation.
- CORRECT**
- Plausible, student misapplies the factor that feedwater flow has on the HB equation.
- Plausible, student misapplies the factor that UFM correction factor has on the HB indication.

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**Level of Knowledge:      HIGH****Difficulty:      3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: G2.2.13-Knowledge of tagging and clearance procedures.

Tier: 3      Group:      RO Imp: 4.1  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: FL-WMN-SHE-002L.014

References: FG-OP-TAG-01, Fleet Tagging Practices, page 15

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**Question:**

A Clearance Request has been generated and you have been assigned to develop the clearance order for P-98A, S/G Blowdown Pump. The scope of the work is to align the pump/motor coupling and perform motor resistance checks. Which one of the following tagging sequences is satisfactory for this clearance?

- a. Open Pump Supply Breaker, 52-353  
Close Pump Suction Valve, MV-MS177  
Close Pump Discharge Valve, MV-DRW795  
Open Pump Casing Drain, MV-MS812
  - b. Close Pump Discharge Valve, MV-DRW795  
Close Pump Suction Valve, MV-MS177  
Open Pump Supply Breaker, 52-353  
Open Pump Casing Drain, MV-MS812
  - c. Close Pump Suction Valve, MV-MS177  
Close Pump Discharge Valve, MV-DRW795  
Open Pump Supply Breaker, 52-353  
Open Pump Casing Drain, MV-MS812
  - d. Open Pump Supply Breaker, 52-353  
Close Pump Discharge Valve, MV-DRW795  
Close Pump Suction Valve, MV-MS177  
Open Pump Casing Drain, MV-MS812
- 
- 

**DISTRACTOR ANALYSIS**

- a. **INCORRECT** – Plausible if the candidate believes that the suction valve should be tagged before the discharge valve. This is a common misconception and can be dangerous. If the discharge check valve leaks by, the suction piping may be exposed the full system pressure and may rupture.
  - b. **INCORRECT** – Plausible if the student believes that components are tagged mechanically then electrically.
  - c. **INCORRECT** – Plausible for same reasons as distractors 'a' and 'b'
  - d. **CORRECT**
- 
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Level of Knowledge: **HIGH**Difficulty: **3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**

K/A: 2.2.25-Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

Tier: 3      Group:      RO Imp:      3.2  
Applicable 10CFR55 Section: 41.10Palisades Learning Objective: **PCS\_E01.04 004**References: **TS 1.0 Definitions and TS 3.4.13 Basis**

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**Question:**

Which one of the following would be classified as IDENTIFIED PCS LEAKAGE?

- a. Leakage into containment from a faulty weld on MV-PC1044A, Pressurizer Vent Valve.
- b. Primary to Secondary leakage from 'A' Steam Generator.
- c. Leakage past RV-1041, Pressurizer Safety Valve.
- d. PCP Controlled Bleedoff Flow.

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**DISTRACTOR ANALYSIS**

- a. Plausible if student believes all leakage to Containment Sump is considered IDENTIFIED PCS LEAKAGE
- b. **CORRECT**
- c. Plausible if student believes all leakage to Quench Tank is considered IDENTIFIED PCS LEAKAGE
- d. Plausible if student believes Controlled Bleedoff is considered PCS LEAKAGE

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**Level of Knowledge:      LOW****Difficulty:      3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **MODIFIED 2013 RO Question #72**

K/A: G2.3.7-Ability to comply with radiation work permit requirements during normal or abnormal conditions.

Tier: 3      Group:      RO Imp: 3.5  
Applicable 10CFR55 Section: 41.12

Palisades Learning Objective: RWT60

References: EN-RP-100

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**Question:**

An RP Technician performing a routine survey in the Auxiliary Building measures a dose rate of 120 mrem/hr one-foot away from the Spent Fuel Pool Heat Exchanger (E-53A) inlet piping. The required posting for this area is   (1)  , which   (2)   require a briefing for entry.

- a. (1) Radiation Area  
    (2) does not
- b. (1) High Radiation Area  
    (2) does
- c. (1) High Radiation Area  
    (2) does not
- d. (1) Radiation Area  
    (2) does

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**DISTRACTOR ANALYSIS**

- a. Plausible if the student incorrectly identifies threshold for High Radiation Area, and based on this choice assumes briefing not required.
  - b. **CORRECT High Rad is >100 mrem/hr and <1000 mrem/hr which requires a High Radiation Briefing.**
  - c. Plausible if the student believes that a separate briefing is not required.
  - d. Plausible if the student incorrectly identifies threshold for High Radiation Area. Plausible if the student believes that all Radiation Areas require a special briefing.
- 
- 

Level of Knowledge: **LOW**Difficulty: **2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: G2.3.13-Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Tier: 3      Group:      RO Imp:      3.4  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF\_CK07.0

References: AOP-24, Attachment 3

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**Question:**

Which one of the following is not an action from AOP-24, "Steam Generator Tube Leak," to help limit the spread of contamination following the discovery of a Steam Generator Tube Leak?

- a. Start a plant heating boiler.
  - b. Route after condenser drains to the condenser.
  - c. Isolate Steam Generator Blowdowns.
  - d. Isolate the Main Steam Reheaters.
- 
- 

**DISTRACTOR ANALYSIS**

- a. Incorrect a plant heating boiler is started so that all extraction steam can be isolated.
  - b. Incorrect after condenser drains can be routed to the floor for chemistry control, the procedure ensures they are captured.
  - c. Incorrect blowdowns are isolated to keep contamination levels in the turbine building down.
  - d. **CORRECT - there is no step in the AOP for isolating the reheaters.**
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Level of Knowledge: LOW

Difficulty: 3



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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK

K/A: G2.3.5-Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

Tier: 3      Group:      RO Imp:      2.9  
Applicable 10CFR55 Section: 41.11

Palisades Learning Objective: RMS\_CK21.0

References: SOP-38, 4.0.d; SOP-5, 4.1.9

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**Question:**

Which one of the following lists the minimum Containment Air Cooler Fans required to be in service, if any, to support operability of Containment Gas Radiation Monitor, RIA-1817?

- a. None, since RIA-1817 has a sample pump.
- b. One Containment Air Cooler Fan.
- c. Two Containment Air Cooler Fans.
- d. Three Containment Air Cooler Fans.

---

**DISTRACTOR ANALYSIS**

- a. Plausible as this has a sample pump, but if no CACs are in operation there is no representative flow path
- b. **CORRECT, A flow path is provided for the radiation monitor with HS-2321 in the RECIRC FANS position and any Containment Air Cooler fan is in service.**
- c. Plausible alternative, however does not meet the minimum requirement in the stem of the question.
- d. Plausible alternative, however does not meet the minimum requirement in the stem of the question.

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**Level of Knowledge:      LOW****Difficulty:      3**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: BANK 2012 ILT Audit Exam Question #73

K/A: G2.4.9-Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

Tier: 3      Group:      RO Imp:      3.8  
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAB\_T04.00

References: EOP Supp 1, page 4; EOP Supplement 1 Basis, page 4

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**Question:**

Which one of the following correctly completes the statement below regarding “Degraded Containment” when used in Emergency Operating Procedures?

Degraded Containment is defined as Containment pressure exceeding 3.0 psig (1) Containment temperature exceeding 175°F. Use of Degraded Containment operating curves (2) when Containment parameters have returned to normal throughout the remainder of the EOP.

- a. (1) and  
(2) shall continue
- b. (1) or  
(2) is optional
- c. (1) and  
(2) is optional
- d. (1) or  
(2) shall continue

---

**DISTRACTOR ANALYSIS**

- a. Plausible: correct definition but wrong significance
- b. Plausible: correct significance but wrong definition.
- c. Plausible: combination of a. and b. above.
- d. **CORRECT**

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**Level of Knowledge:      LOW****Difficulty:      2**

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**WRITTEN QUESTION DATA SHEET**

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Source of Question: **BANK**K/A: **G2.4.34-Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.**Tier: **3**      Group:      RO Imp:      **4.2**  
Applicable 10CFR55 Section:      **41.7**Palisades Learning Objective: **SWS\_CK08.0**References:      **M-208**

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**Question:**

Which of the following Service Water System components does the operator have the capability of manipulating from C-33, Redundant Safety Injection Panel?

- a. CV-0821, CCW HX E-54A Temperature Control.
- b. CV-1359, Non-critical Service Water Header isolation.
- c. CV-0847, Service Water Supply to Containment.
- d. CV-0857, Critical Service Water Headers cross-tie.

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**DISTRACTOR ANALYSIS**

- a. Plausible, if student confuses Service Water valves to CCW heat Exchanger with CCW Isolation Valves
- b. Plausible, if student believes remote isolation of Non-Critical SW Header is required for Safe Shutdown
- c. **CORRECT, SW isolations to and from Containment are available at the C-33 Panel**
- d. Plausible, if student believes remote operation of Critical SW Header Crosstie Valves is required for post-accident cooling capability.

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**Level of Knowledge:      LOW****Difficulty:      2**

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