

WRITTEN QUESTION DATA SHEET**NOTE:**

- Questions 1 through 75 are RO level questions.
- Questions 76 through 100 are SRO level questions.

Source of Question: **NEW**

K/A: 000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1

EK1.1 - Knowledge of the operational implications of the following concepts as they apply to the (Reactor Trip Recovery): Components, capacity, and function of emergency systems

Tier: 1 Group: 1 RO Imp: 2.9
 Applicable 10CFR55 Section: 41.8/41.10

Palisades Learning Objective: **AFW_CK10.0**References: **E-17, sheet 21, 21A****Question:**

Given the following:

- The Plant has automatically tripped from 100% power
- EOP-1.0, "Standard Post Trip Actions," are in progress
- P-8A, AFW Pump, is out of service for maintenance

Which one of the following describes the response of P-8C, AFW Pump, for this event? (Assume levels given are by narrow range S/G level indication)

P-8C will start ...

- a. immediately after both S/G levels lower to 30%.
- b. immediately after either S/G level lower to 30%.
- c. approximately 30 seconds after both S/G levels lower to 30%.
- d. approximately 30 seconds after either S/G level lowers to 30%.

DISTRACTOR ANALYSIS

- a. Plausible because the student believes that both S/Gs must be 30% and the 30 second time delay has elapsed.
- b. Plausible because the student believes that the 30 second time delay has elapsed.
- c. Plausible because the student believes that both S/Gs must be 30%.
- d. **CORRECT**

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

WRITTEN QUESTION DATA SHEET

Source of Question: BANK

K/A: 000008 Pressurizer Vapor Space Accident / 3

AK2.01 - Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Valves

Tier: 1 Group: 1 RO Imp: 2.7

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: GFAD lesson plan objective #21

References: Steam Tables (PROVIDE); GFES lesson plan - Thermodynamic Processes

Question:

Given the following plant conditions:

- Pressurizer pressure is 2060 psia
- Quench Tank pressure is 5 psig

Which one of the following would be the initial downstream tailpipe temperature indication if RV-1039, Pressurizer Safety Relief Valve, opened?

- 165°F.
 - 212°F.
 - 230°F.
 - 338°F.
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DISTRACTOR ANALYSIS

- Plausible if the student takes the 2060 psia constant enthalpy expansion to 5 psia instead of 20 psia. This corresponds to 165°F.
 - Plausible if the student believes that the quench tank rupture disc will actuate causing the pressure to equalize with containment pressure which is atmospheric. This corresponds to 212°F.
 - CORRECT - Applying Mollier diagram to 2060 psia, constant enthalpy expansion to 20 psia (5 psig + 15 psi) yields 230°F.**
 - Plausible if the student believes that quench tank pressure will immediate rise to the rupture disc setpoint (100 psig) and then remain 100 psig. This corresponds to 338°F.
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Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000009 Small Break LOCA / 3

EK3.18 - Knowledge of the reasons for the following responses as they apply to the small break LOCA: Monitoring containment radiation levels

Tier: 1 Group: 1 RO Imp: 3.9

Applicable 10CFR55 Section: 41.5/41.10

Palisades Learning Objective: TBAG_TBCORE_CK02.0

References: EOP-4.0, step 13; EOP-4.0 basis page 39

Question:

Operators are directed to monitor Containment Area Radiation Monitors, RIA-1805, RIA-1806, RIA-1807, and RIA-1808 during a Loss of Coolant Accident (LOCA) per EOP-4.0, "LOCA Recovery" to determine:

- a. when Containment Spray is no longer needed for iodine removal.
 - b. when to initiate simultaneous hot and cold leg injection.
 - c. if a Containment Isolation signal should have initiated.
 - d. if an Emergency Classification threshold is exceeded.
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DISTRACTOR ANALYSIS

- a. Plausible but the high range gamma monitors are used for this function.
 - b. Plausible but this is performed 5.5 hours after LOCA.
 - c. **CORRECT**
 - d. Plausible, but EI-1.1 uses high range monitors to determine status of fission product barriers.
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Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: MODIFIED - Palisades

K/A: 000011 Large Break LOCA / 3

EA1.07 - Ability to operate and monitor the following as they apply to a Large Break LOCA: Containment isolation system

Tier: 1 Group: 1 RO Imp: 4.4
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: IOTF_CK04.0

References: EOP Supplement 6

Question:

Given the following:

- A Loss of Coolant Accident has occurred from 100% power
- Containment Radiation Levels indicate 12R/Hour
- Maximum Containment Pressure during the LOCA reached 3.4 psig

Which one of the following valves will automatically close based on the above conditions?

- a. CV-0910, CCW Supply to Containment.
- b. CV-2083, PCP Controlled Bleedoff Isolation.
- c. CV-2111, Charging Line Containment Isolation.
- d. CV-0510, S/G E-50A Main Steam Isolation Valve.

DISTRACTOR ANALYSIS

- a. Plausible because this valve closes on CHP only which has not occurred (setpoint 4 psig).
- b. **CORRECT**
- c. Plausible because Letdown Isolation closes on CHR but Charging does not.
- d. Plausible because this valve closes on CHP only which has not occurred (setpoint 4 psig).

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 000015/17 RCP Malfunctions / 4

AA2.01 - Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions
(Loss of RC Flow): Cause of RCP failureTier: 1 Group: 1 RO Imp: 3.0
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PCP_CK16.0

References: ARP-5, window 1

Question:

Given the following with the Plant operating at full power:

- P-50A, Primary Coolant Pump, (PCP) ammeter lowers to approximately 100 amps
- The reactor automatically trips approximately 1-2 seconds later
- PCPs P-50B, C, D remain operating normally

Which one of the following would account for all of the above conditions?

- a. P-50A pump shaft seized and the Reactor tripped due to low Primary Coolant flow.
 - b. P-50A pump shaft sheared and the Reactor tripped due to low Primary Coolant flow.
 - c. P-50A pump shaft seized and the Reactor tripped due to Thermal Margin/Low Pressure.
 - d. P-50A pump shaft sheared and the Reactor tripped due to Thermal Margin/Low Pressure.
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DISTRACTOR ANALYSIS

- a. Plausible but if the pump shaft was seized, amps would be much higher or the output breaker would have tripped and amps would be zero.
 - b. **CORRECT**
 - c. Plausible but amps would be zero or max and the reactor would trip on low PCS flow.
 - d. Plausible but reactor will trip on low PCS flow (96%).
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Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

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

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

Tier: 1 Group: 1 RO Imp: 4.2

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: CVCS_CK10.0

References: ARP-4, window 10

Question:

Given the following:

- The Plant is in MODE 1 at full power
- Charging and Letdown systems are aligned for normal operation
- EK-0709, "VOLUME CONTROL TANK HI-LO LEVEL" alarm annunciates

While investigating the above alarm, EK-0710, "VOLUME CONTROL TANK LO-LO LEVEL" alarm annunciates. Which one of the following describes the effect on the Plant due to this condition and the reason?

- a. Reactor power will be lowering due to Charging Pumps swapping suction to Boric Acid Storage Tanks.
 - b. Reactor power will be lowering due to Charging Pumps swapping suction to the SIRW Tank.
 - c. Pressurizer level will be lowering due to all Charging Pumps automatically tripping.
 - d. Pressurizer level will be lowering due to all Letdown Orifice Stop Valves automatically opening.
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DISTRACTOR ANALYSIS

- a. Plausible if the student confuses the automatic swapover to the SIRW tank with Boric Acid Storage Tanks.
 - b. **CORRECT**
 - c. Plausible if the student believes that this is an automatic action, which it is not.
 - d. Plausible if the student believes that this is an automatic action, which it is not.
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Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 000025 Loss of RHR System / 4

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

Tier: 1 Group: 1 RO Imp: 3.9
Applicable 10CFR55 Section: 41.8/41.10

Palisades Learning Objective: SDC_CK08.0

References: Operator Aid 116

Question:

Given the following conditions:

- The Plant is in MODE 5 with the Shutdown Cooling System in service
- CV-3006, SDC Heat Exchangers Bypass, is being throttled 30% open in MANUAL by FIC-0306, SD CLG HXS Bypass Controller, on Panel C-02
- Y01, Instrument AC Bus, de-energizes due to a loss of the normal power supply
- Due to a malfunction, Y50, Instrument AC Bus Transfer Switch, transfers to the alternate power supply 10 seconds later

After Y01 is re-energized, CV-3006 will be

- a. full closed.
- b. 30% open.
- c. 50% open.
- d. full open.

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that this is the fail position for this valve.
- b. Plausible if the student believes that the valve will "remember" what position it was in prior to the loss of power.
- c. Plausible if the student confuses operation of CV-3006 with operation of CV-3055, SDC HX Inlet Valve, i.e., that it has air ported to the top of the cylinder and the bottom, therefore the valve would be 50% open.
- d. **CORRECT - This question tests the candidates knowledge of a re-energization of FIC-0306 after a loss of power for > 2seconds.**

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

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

AK3.03 - Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: Guidance actions contained in EOP for Loss of CCW

Tier: 1 Group: 1 RO Imp: 4.0
 Applicable 10CFR55 Section: 41.5/41.10

Palisades Learning Objective: IOTF_CK15.0

References: ONP-6.2, step 4.3

Question:

Given the following:

- The Plant is in MODE 3 with a cooldown in progress in accordance with GOP-9, "MODE 3 \geq 525°F TO MODE 4 OR MODE 5"
- A loss of Component Cooling Water (CCW) event occurs
- The Control Room team enters ONP-6.2, "Loss of Component Cooling"

Why does ONP-6.2 direct Operators to secure Charging Pump, P-55A, but NOT Charging Pumps P-55B or P-55C?

- a. P-55A lubricating oil will reach a high temperature limit rapidly on a loss of CCW.
- b. P-55B and P-55C have NO interface with CCW.
- c. P-55A fluid drive will reach a high temperature limit rapidly on a loss of CCW.
- d. P-55B and P-55C automatically trip on a loss of CCW.

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that the lubricating oil is the same oil that operates the fluid drive (these are separate systems).
- b. Plausible but CCW cools the oil system, however, the pump can operate for hours without CCW.
- c. **CORRECT**
- d. Plausible if the student believes that P-55B and P-55C trip on loss of CCW because P-55A is variable speed and stays in service.

Level of Knowledge: **LOW**

Difficulty: **2**

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

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

AK2.03 - Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners

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

Palisades Learning Objective: PPCS_CK09.0

References: SOP-1A, 7.2.2.b.2.e

Question:

Given the following with the Plant at full power:

- Pressurizer pressure is being controlled at setpoint by PIC-0101A (Channel 'A') in AUTOMATIC
- I&C has just completed working on PIC-0101B (Channel 'B') and requests that control be transferred to Channel 'B' to verify proper operation of the controller
- Currently, PIC-0101B is in MANUAL with the output at 100%

Which one of the following shows the status of Pressurizer Heater Control Equipment immediately after placing Pressurizer Pressure Control Selector Switch, 1/PRC-0101, in the Channel 'B' position under the above conditions?

	<u>SPRAY VALVES</u>	<u>Proportional Heaters</u>	<u>Backup Heaters</u>
a.	Full open	Minimum Amps	Energized
b.	Full open	Minimum Amps	OFF
c.	Full open	OFF	OFF
d.	Full closed	Maximum Amps	Energized

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible if the student believes backup heaters are controlled by the PZR pressure controller.
- c. Plausible if the student believes that proportional heaters are turned off by the PZR pressure controller.
- d. Plausible if the student believes that 100% output on the controller is spray valves closed and heaters max.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: MODIFIED - Palisades 2008 NRC RO Exam #9

K/A: 000029 ATWS / 1

EA1.08 - Ability to operate and monitor the following as they apply to a ATWS: Reactor trip switch pushbutton

Tier: 1 Group: 1 RO Imp: 4.5

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: RPS_CK27.0

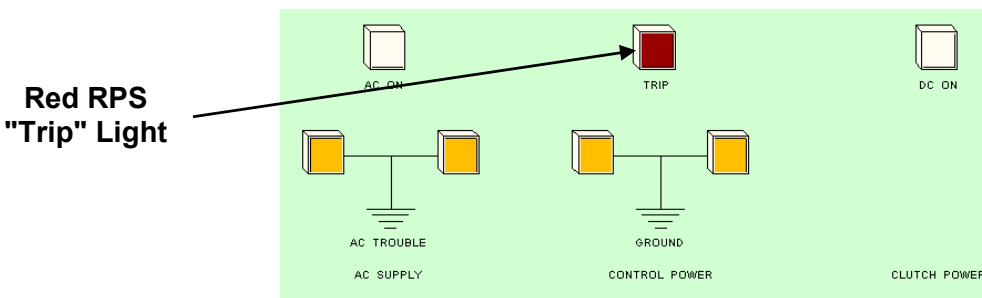
References: Drawing M1Q-114

Question:

With the Plant at full power the following occurs:

- The Main Turbine trips due to a low vacuum condition, but the reactor does NOT automatically trip
- The Reactor Operator attempts to trip the reactor using the pushbutton on panel C-02, but is unsuccessful
- The Reactor Operator 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

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

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

EA2.09 - Ability to determine or interpret the following as they apply to a SGTR: Existence of natural circulation, using plant parameters

Tier: 1 Group: 1 RO Imp: 4.2
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: TBAC_E02.04

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

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 T_{HS} and T_{CS} must be constant or lowering.
- b. Core ΔT must be $< 50^\circ\text{F}$; $506^\circ\text{F} - 461^\circ\text{F} = 45^\circ\text{F}$.
- c. **CORRECT - Difference between Loop T_H 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°F - CET Temp of $506^\circ\text{F} = 28^\circ\text{F}$ subcooling.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 2007 NRC RO Exam #74

K/A: 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4

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

Tier: 1 Group: 1 RO Imp: 3.8

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAD_E04.03

References: EOP-6.0 Basis, page 40

Question:

Given the following:

- A Main Steam Line Break has occurred outside of Containment and upstream of CV-0510, 'A' Steam Generator (S/G) Main Steam Isolation Valve
- The 'A' S/G has blown dry
- An Operator has been directed to perform the actions outside the Control Room necessary for isolation of 'A' S/G

What effect, if any, will isolating the 'B' S/G (vice the 'A' S/G) have on the Control Room's ability to mitigate this event?

- a. No effect because the 'A' and 'B' main steam lines are cross-tied.
- b. No effect because the Turbine Bypass Valve can be used for PCS Heat Removal.
- c. Will lose the ability to control PCS temperature using the ADVs.
- d. Will lose the ability to control PCS pressure.

DISTRACTOR ANALYSIS

- a. Plausible if the student has a faulty mental picture of the Main Steam diagram and where the MSIVs are located in reference to the cross-tie line.
- b. Plausible if the student once again has a faulty mental picture of the Main Steam diagram and believes the TBV can be used without cross-tying S/Gs and blowing them both dry.
- c. **CORRECT**
- d. Plausible if the student believes that the PORVs are not available to lower pressure.

Level of Knowledge: **HIGH**

Difficulty: **2**

WRITTEN QUESTION DATA SHEET

Source of Question: MODIFIED - Palisades

K/A: 000054 (CE/E06) Loss of Main Feedwater / 4

EK1.3 - Knowledge of the operational implications of the following concepts as they apply to the (Loss of Feedwater):
Annunciators and conditions indicating signals, and remedial actions associated with the (Loss of Feedwater)Tier: 1 Group: 1 RO Imp: 3.2
Applicable 10CFR55 Section: 41.8/41.10

Palisades Learning Objective: IOTF_CK05.0

References: ONP-3, step 3.2

Question:

Given the following:

- The Plant is at 83% power
- MFPs, P-1A and P-1B, are in service

Based on the above conditions, which one of the following requires an immediate reactor trip and entry into EOP-1.0, "Standard Post Trip Actions"?

- a. EK-0160, "FDWTR PUMPS LO SUCTION," alarms with MFP suction pressure indicating 280 psig and stable.
 - b. EK-0143, "FW PUMP P1A TURBINE K7A TRIP," alarms with associated Trip & Throttle Valves indicating closed.
 - c. EK-0962, "STEAM GEN E-50A LO LEVEL," alarms with 'A' S/G level indicating 47% and lowering.
 - d. EK-0961, "STEAM GEN E-50A HI LEVEL," alarms with 'A' S/G level indicating 85% and stable.
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DISTRACTOR ANALYSIS

- a. Plausible but both MFPs will still be in service. ARP actions do not direct a trip for this alarm.
 - b. **CORRECT**
 - c. Plausible but reactor trip is not directed until level reaches 30%.
 - d. Plausible but reactor trip is not directed until level reaches 90%.
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Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 2007 NRC RO Exam #13

K/A: 000055 Station Blackout / 6

G2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation

Tier: 1 Group: 1 RO Imp: 4.3

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAR_TBCORE_CK01.0

References: EOP-3.0 Basis, page 18, 19; EOP-3.0, Note prior to Step 8

Question:

During a Station Blackout event, what is the preferred method of controlling PCS temperature?

- a. Turbine Bypass Valve Controller, PIC-0511, in AUTO.
 - b. Atmospheric Dump Valves with Steam Dump Controller, HIC-0780A, in MANUAL.
 - c. Atmospheric Dump Valves with Steam Dump Controller, HIC-0780A, in AUTO.
 - d. Turbine Bypass Valve Controller, PIC-0511 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. Also, there is no power to the TBV controller.
 - b. **CORRECT**
 - c. The ADV controllers are not tuned for automatic mode during natural circ operations.
 - d. 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. Also, there is no power to the TBV controller.
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Level of Knowledge: **LOW**Difficulty: **2**

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

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

AK3.01 - Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus:
Actions contained in EOP for loss of vital ac electrical instrument busTier: 1 Group: 1 RO Imp: 4.1
Applicable 10CFR55 Section: 41.5/41.10

Palisades Learning Objective: IOTF_CK04.0

References: ONP-24.5 NOTE; ONP-17, step 4.15.5

Question:

Given the following:

- The Plant is in MODE 5
- Shutdown Cooling is in service using P-67A, LPSI Pump
- Then, Y01, Instrument AC Bus, de-energizes
- The Control Room team references ONP-24.5, "Loss of Instrument AC Bus Y01."

Why does ONP-24.5 direct the Control Room team to enter ONP-17 "Loss of Shutdown Cooling," to mitigate this event?

- a. CV-0937 and CV-0938, CCW to Shutdown Cooling HXs Inlet, fail closed upon a loss of Y01.
- b. CV-3006, Shutdown Cooling HXs Bypass, fails open upon a loss of Y01.
- c. CV-0913, Safety Injection Pumps Seal Cooling Supply, fails closed upon a loss of Y01.
- d. CV-3027 and CV-3056, SIRW Tank T-58 Recirc, fail open upon a loss of Y01.

DISTRACTOR ANALYSIS

- a. Plausible as this is the cooling water for SDC Heat Exchangers.
- b. **CORRECT - ONP-17 provides direction on taking manual control of CV-3025.**
- c. Plausible if the student believes that this valve will fail closed on a loss of Y-01. The student incorrectly recalls a specific feature of this valve in which it is kept open all the time instead of relying on a SIS signal to open it.
- d. Plausible as this will divert water away from the SDC Heat Exchangers.

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 2008 NRC RO Exam #15

K/A: 000058 Loss of DC Power / 6

AA1.01 - Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Cross-tie of the affected dc bus with the alternate supply

Tier: 1 Group: 1 RO Imp: 3.4
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: EPS_CK05.0

References: ONP-2.3, attachment 1

Question:

The following alarm is received in the control room:

EK-0548 "125V DC BUS UNDERVOLTAGE/TROUBLE"

The cause of the alarm is determined to be an inadvertent opening of 125 VDC Tie Breaker for DC Buses D20R and D20L, 72-20. Which one of the following actions will restore power to D20L?

- a. Place Battery Charger #2 in service from MCC-2.
 - b. Place Battery Charger #4 in service from MCC-2.
 - c. Place Battery Charger #2 in service from MCC-1.
 - d. Place Battery Charger #4 in service from MCC-1.
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DISTRACTOR ANALYSIS

- a. Plausible if the student believes that charger #2 is isolated from the station battery.
 - b. Plausible if the student believes that charger #4 is the non cross-connected battery charger.
 - c. Plausible if the student believes that charger #2 is isolated from the station battery and is the cross-connected battery charger.
 - d. **CORRECT**
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Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000062 Loss of Nuclear Svc Water / 4

AA2.04 - Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The normal values and upper limits for the temperatures of the components cooled by SWS

Tier: 1 Group: 1 RO Imp: 2.5
Applicable 10CFR55 Section: 41.4

Palisades Learning Objective: IOTF_CK04.0

References: ARP-20A, windows 4 and 9; DBD-5.01, page 38

Question:

Given the following with the Plant operating at full power:

- Emergency Diesel Generator (EDG) 1-1 monthly surveillance test, MO-7A-1, is in progress
- EDG 1-1 is loaded to 1000 kW
- EK-0551, "DIESEL GEN NO 1-1 TROUBLE," annunciates
- The Auxiliary Operator reports that EK-2011, "LOW RAW WATER PRESSURE," is annunciating on the local EDG 1-1 alarm panel
- Raw water pressure on the 1-1 EDG local control panel indicates 0 (zero) psig

Which one of the following will occur if no operator action is taken?

EDG 1-1 will ...

- a. trip when jacket water temperature reaches 195°F.
- b. continue to operate until engine damage occurs from overheating.
- c. trip when lube oil temperature reaches 205°F.
- d. continue to operate normally since engine load is < 1500 kW.

DISTRACTOR ANALYSIS

- a. Plausible because an alarm will occur when jacket water temperature reaches 195°F but there is no auto trip.
- b. **CORRECT**
- c. Plausible because an alarm will occur when lube oil temperature reaches 200°F but there is no auto trip.
- d. Plausible if the student believes that external sw cooling is only absolutely necessary for high EDG loads as in a DBA.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000077 Generator Voltage and Electric Grid Disturbances / 6

AK2.07 - Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: Turbine / generator control

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

Palisades Learning Objective: MGEN_CK08.0

References: GFES objective N-RO-01-L-017-I_18

Question:

The Plant is operating at full power when a disturbance on the grid causes the following Main Generator indications:

- 832 MWe
- 350 MVARs OUT
- 22,500 Amps

The Control Room Supervisor then orders the NCO-T to adjust MVARs to 0 (zero). Upon completion of adjusting MVARs, amps will be (1) and MWe will be (2) .

- a. (1) lower
 (2) lower
 - b. (1) lower
 (2) unchanged
 - c. (1) unchanged
 (2) lower
 - d. (1) unchanged
 (2) unchanged
-

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that MWe will be affected by adjustment of MVARs.
 - b. **CORRECT**
 - c. Plausible if the student believes that the ammeter does not reflect changes in MVARs and that that MWe will be affected by adjustment of MVARs.
 - d. Plausible if the student believes that the ammeter does not reflect changes in MVARs.
-

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000028 Pressurizer Level Malfunction / 2

AK3.05 - Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunctions: Actions contained in EOP for PZR level malfunction

Tier: 1 Group: 2 RO Imp: 3.7
Applicable 10CFR55 Section: 41.5/41.10

Palisades Learning Objective: PLCS_CK08.0

References: SOP-1A, step 7.2.1.f.5; ARP-4, window 64

Question:

Given the following:

- The Plant is operating at 100% power
- 'A' Channel of Pressurizer Level Control (LIC-0101A) is in service due to 'B' channel (LIC-0101B) failing low
- ALL Pressurizer Heaters are tripped off and CV-2003, Orifice Stop Valve, is closed due to LIC-0101B failing low
- Pressurizer Heater Control Channel Selector Switch (1/LIC-0101) is in the '**A**' and '**B**' position
- Charging, Letdown, and Pressurizer Heater Controls are lined up for normal operation

Plant procedures direct the Pressurizer Heater Control Channel Selector Switch (1/LIC-0101) be placed in Channel '**A**' for this condition. What will automatically occur when this is completed?

- a. CV-2003 will open AND Pressurizer Heaters powered from ONLY Bus 1E will energize.
- b. CV-2003 will open AND Pressurizer Heaters powered from Bus 1D AND Bus 1E will energize.
- c. ONLY CV-2003 will open.
- d. ONLY Pressurizer Heaters powered from Bus 1E will energize.

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible because this was the original intent of the control switch, but a modification was installed due to EDG loading such that when heaters from Bus 1D are tripped, manual initiation is required to re-energize them.
- c. Plausible if the student does not know that pressurizer heaters trip on low level.
- d. Plausible if the student believes that CV-2003 is not controlled from PZR Level.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000036 (BW/A08) Fuel Handling Accident / 8

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

Tier: 1 Group: 2 RO Imp: 4.2

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF_CK01.0

References: E-17, sheet 7; ARP-7, window 26

Question:

Given the following:

- The Plant is in MODE 6 with refueling operations in progress
- Containment Refueling Monitors, RIA-2316 and RIA-2317, are in service (switches cut 'IN')

Which one of the following alarms, if any, would alert the Control Room team that RIA-2316 reached an alarm setpoint due to a fuel handling incident?

- a. EK-1126, "CIS INITIATED."
 - b. EK-1363, "CONTAINMENT HI RADIATION."
 - c. EK-1366, "PLANT MONITORING HI RADIATION."
 - d. NONE, RIA-2316 AND RIA-2317 are BOTH required to alarm.
-
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible because this is 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.
 - c. Plausible because various ARM systems initiate this alarm, however, RIA-2316 does not.
 - d. Plausible if the student misapplies the logic for CIS from the Refueling Monitors and believes that it is 2/2.
-
-

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

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000037 Steam Generator Tube Leak / 3

AA2.11 - Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: When to isolate one or more S/Gs

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

Palisades Learning Objective: IOTF2_E13.03

References: EOP-5.0, step 22

Question:

Given the following:

- The Plant was tripped due to a tube leak in the 'A' Steam Generator (S/G)
- EOP-1.0, "Standard Post Trip Actions," have been completed
- The crew has transitioned to EOP-5.0, "Steam Generator Tube Rupture Recovery"
- The Control Room team is reviewing the conditions necessary to isolate the 'A' Steam Generator per EOP Supplement 12, 'A' S/G SGTR Isolation Checklist"

Which one of the following would indicate to the Control Room team that isolation of the 'A' Steam Generator is NOT allowed per EOP-5.0?

- a. PCS Pressure is 75 psi above 'A' Steam Generator Pressure.
 - b. Core Exit Thermocouple (CET) Temperature is 528°F.
 - c. 'A' Steam Generator Pressure is 920 psia.
 - d. Narrow Range Hot Leg Temperature is 526°F.
-

DISTRACTOR ANALYSIS

- a. Plausible if the student gets confused between isolation of the S/G and lowering PCS pressure to within 50 psi to allow backflow.
 - b. Plausible if the student does not know that EOP-5.0 specifies that the crew uses narrow range T_H instruments only
 - c. Plausible because EOP-5.0 directs the crew to unisolate a S/G with an ASDV if pressure is >940 psia.
 - d. **CORRECT**
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 000060 Accidental Gaseous Radwaste Rel. / 9

G2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

Tier: 1 Group: 2 RO Imp: 4.0
 Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: RMS_CK09.0

References: ARP-8, attachment 2, M-218, sheet 2

Question:

Given the following:

- The Waste Gas System is lined up for normal operation
- An inadvertent release to the Plant Stack from Waste Gas Decay Tank, T-101A, occurs
- RIA-1113, Waste Gas Discharge Monitor, alarms, however, CV-1123, Waste Gas Decay Tank Discharge, does NOT close to isolate the release

Assuming high activity in T-101A, which one of the following lists the other Radiation Monitor(s), if any, that can be used to validate the RIA-1113 alarm?

- a. None, RIA-1113 is the only monitor that can detect high activity during a Waste Gas release.
- b. RIA-2326, Normal Range Noble Gas Stack Monitor, ONLY.
- c. RIA-1809, Radwaste Exhausters Monitor, AND RIA-2326, Normal Range Noble Gas Stack Monitor.
- d. RIA-1809, Radwaste Exhausters Monitor, ONLY.

DISTRACTOR ANALYSIS

- a. The student misapplies the flow path of waste gas. This is plausible because waste gas does have a different flowpath. All area exhausters discharge into the exhaust plenum but waste gas is discharged directly to the stack.
- b. **CORRECT**
- c. The student misapplies the flow path of waste gas, i.e., through the radwaste exhausters and then to the exhaust plenum to the stack. This is plausible because this is the flowpath of the containment vent.
- d. The student misapplies the flow path of waste gas i.e., through the radwaste exhausters and then to the stack downstream of the radiation monitors.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 000061 ARM System Alarms / 7

AK1.01 - Knowledge of the operational implications of the following concepts as they apply to Area Radiation Monitoring (ARM) System Alarms: Detector limitations

Tier: 1 Group: 2 RO Imp: 2.5
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAB_CK01.0

References: EOP-1 basis, step 9

Question:

The Containment Radiation Monitors, RIA-1805, RIA-1806, RIA-1807, and RIA-1808, can fail high during a LOCA or ESDE due to the harsh environmental effects on these instruments. Due to this condition, which one of the following actions is performed during EOP-1.0, "Standard Post Trip Actions," when Containment radiation levels indicate >10R/Hr?

- Ensure operating all Containment Air Cooler Fans and open all Containment Air Cooler High Capacity Service Water Valves.
 - Verify EK-1363, "CONTAINMENT HI RADIATION," is NOT in an alarm condition.
 - Corroborate Containment radiation readings with Containment Ventilation System Radiation Monitor, RIA-1817, reading.
 - Corroborate Containment radiation readings with Containment High Range Monitors, RIA-2321/2322, readings.
-

DISTRACTOR ANALYSIS

- Plausible as this is an immediate action in EOP-1.0 for containment atmosphere.
 - Plausible but this alarm comes from the Containment Area Radiation Monitors.
 - Plausible but this is a gaseous monitor.
 - CORRECT**
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 000067 Plant Fire On-site / 8

AK3.04 - Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site: Actions contained in EOP for plant fire on site

Tier: 1 Group: 2 RO Imp: 3.3

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBAM_CK09.0

References: ONP-25.2 attachment 8 NOTE prior to step 1.0.f

Question:

Given the following:

- A fire occurs in the Cable Spreading Room which requires tripping the Reactor and evacuating the Control Room
- The Shift Manager has directed C-150/C-150A, Auxiliary Hot Shutdown Panels, be placed in service
- The AVG TEMP DISPLAY SELECT SWITCH on panel C-02 is in the "LOOP 1" position

ONP-25.2, "Alternate Safe Shutdown Procedure," directs placing the AVG TEMP DISPLAY SELECT SWITCH in the "LOOP 2" position prior to evacuating the Control Room.

If this step is NOT completed, when C-150/C-150A panels are placed in service ...

- a. the Atmospheric Dump Valves will open.
- b. the Atmospheric Dump Valves will not open, if required.
- c. T_{AVE} indication will not be accurate.
- d. T_{AVE} indication will not be available.

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible because the signal for opening the ADVs on a high T_{AVE} signal is routed through this switch.
- c. Plausible if the student believes that the switch routes the T_H and T_C signals to C-150A, however T_{AVE} is not available at C-150/C-150A.
- d. Plausible because the signal for opening the ADVs on a high T_{AVE} signal is routed through this switch, however T_{AVE} is not available at C-150/C-150A.

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

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000069 (W/E14) Loss of CTMT Integrity / 5

AA2.02 - Ability to determine and interpret the following as they apply to the Loss of Containment Integrity:
Verification of automatic and manual means of restoring integrity.Tier: 1 Group: 2 RO Imp: 3.9
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF1_T08.00

References: ONP-17, step 4.8

Question:

Given the following with the Plant in MODE 6 during a refueling outage:

- The Reactor Cavity is full
- All Containment Building penetrations are OPERABLE
- The Emergency Escape Airlock is closed
- A loss of Shutdown Cooling event occurs
- The time for the PCS to reach 200°F is 3 hours

Which one of the following describes when Containment personnel passages shall be closed and the minimum requirements for closure in accordance with ONP-17, "Loss of Shutdown Cooling"?Containment passage closure shall be achieved prior to the time it takes for _____ (1) _____.
As a minimum, the Equipment Hatch and _____ (2) _____ door(s) of the Personnel Air Lock shall be closed.

- a. (1) PCS temperature to heat up to 200°F
(2) one
- b. (1) RIA-2316 or RIA-2317, Containment Refueling Monitor, to alarm
(2) one
- c. (1) PCS temperature to heat up to 200°F
(2) both
- d. (1) RIA-2316 or RIA-2317, Containment Refueling Monitor, to alarm
(2) both

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible but not required.
- c. Plausible if the student believes that the Personnel Air lock must have both doors closed.
- d. Plausible for the same reasons as 'b' and 'c' combined.

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 000076 High Reactor Coolant Activity / 9

AK2.01 - Knowledge of the interrelations between the High Reactor Coolant Activity and the following: Process radiation monitors

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

Palisades Learning Objective: RMS_CK14.0

References: ARP-33, window 7

Question:

Given the following:

- A fuel cladding failure event is in progress
- The Control Room team has implemented ONP-11.1, "Fuel Cladding Failure"
- Radioactive Gas Effluent Monitor (RGEM) annunciator EK-0207, "STACK EFF RAD C-169 HIGH" is received in the Control Room

Which one of the following will automatically occur based on the above conditions?

- a. Both RGEM sample pumps, P-2301A and P-2301B, will start.
 - b. RGEM transfers to RIA-2327, High Range Noble Gas Monitor.
 - c. RIA-2327, High Range Monitor, transfers from R/hr mode to uCi/ml mode.
 - d. RIA-2325, Iodine and Particulate Monitor, is aligned for operation.
-

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that more flow is needed because there is two parallel flow paths in the accident mode.
 - b. **CORRECT**
 - c. Plausible if the student believes that the meter reads in uCi/ml for a more accurate off-site dose assessment.
 - d. Plausible because Iodine is an off-site dose concern.
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4

AA1.1 - Ability to operate and / or monitor the following as they apply to the (Natural Circulation Operations): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features

Tier: 1 Group: 2 RO Imp: 3.3

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBAC_E02.04

References: EOP-8.0, step 19, EOP-8.0 step 19 basis, Steam Tables (PROVIDE)

Question:

Given the following during a Loss of Forced Circulation Event:

- T_H temperature is 578°F
- T_C temperature is 538°F
- Average Qualified CET temperature is 582°F
- T_{AVE} is 556°F
- Pressurizer Pressure is 2060 psia

Which one of the following is the correct value for PCS subcooling?

- a. 58°F.
- b. 62°F.
- c. 84°F.
- d. 102°F.

DISTRACTOR ANALYSIS

- a. **CORRECT** - per EOP-8.0, step 19, average CET temperature is used to determine subcooling. Saturation temperature for PCS pressure is 640°F - 582°F (Average CET temperature) is 58°F.
- b. Plausible - this corresponds to hot leg temperature.
- c. Plausible - this corresponds to average coolant temperature.
- d. Plausible - this corresponds to cold leg temperature.

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

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 003 Reactor Coolant Pump

K6.04 - Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Containment isolation valves affecting RCP operation

Tier: 2 Group: 1 RO Imp: 2.8

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PCP_CK16.0

References: M-202, sheet 1; ARP-5, window 59

Question:

The Plant is operating at full power when a spurious Containment High Radiation (CHR) signal occurs. Which one of the following describes the effect of this condition on the Primary Coolant Pumps?

- a. Seal temperatures will rise.
 - b. Controlled Bleedoff flow will lower to zero.
 - c. Controlled Bleedoff pressure will rise.
 - d. Controlled Bleedoff pressure will lower to zero.
-

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that a CHR causes a loss of CCW to the PCPs.
 - b. Plausible because backpressure rises, however, each stage pressure will rise to maintain flow stable.
 - c. **CORRECT - Upon a CHR, normal CBO isolates causing RV-2082 to open at 145 psig; Normal CBO pressure is 25 - 100 psig.**
 - d. Plausible because the PSDT is vented to atmosphere.
-

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 004 Chemical and Volume Control

A1.11 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: Letdown and charging flows

Tier: 2 Group: 1 RO Imp: 3.0
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: PLCS_CK09.0

References: ARP-4, window 1

Question:

Given the following conditions:

- The Plant is operating at full power
- Pressurizer level is at program level and stable
- P-55A, Charging Pump, is operating in CASCADE speed control
- EK-0701, "REGEN HT EX TUBE OUTLET HI TEMP," annunciates on panel C-12
- TICA-0201, Letdown Temp indication, fails off-scale high (> 600°F)
- TI-0212, Charging Temp, indicates 400°F

Assuming no operator action, which one of the following identifies the resulting charging and letdown flow after several minutes?

	<u>CHARGING</u>	<u>LETDOWN</u>
a.	33 GPM	40 GPM
b.	0 GPM	40 GPM
c.	33 GPM	0 GPM
d.	0 GPM	0 GPM

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that charging goes to minimum and one letdown orifice stop valve stays open.
- b. Plausible if the student believes that charging only isolates on high temperature.
- c. **CORRECT - CV-2001, letdown stop valve, closes @ 470°F letdown temperature.**
- d. Plausible because the student may believe that charging flow isolates on high temperature in addition to letdown.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 005 Residual Heat Removal

A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR pump/motor malfunction

Tier: 2 Group: 1 RO Imp: 2.9

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: IOTF_CK15.0

References: ARP-7, window 62 and ONP-17 step 4.2

Question:

The following conditions exist during a Plant cooldown:

- The Plant is in MODE 4 at 255°F
- The PCS is in solid Plant pressure control at 255 psia
- Shutdown cooling is in-service using P-67A, LPSI Pump
- P-50B and P-50D, Primary Coolant Pumps, are in-service
- All PCS and SDC temperatures are slowly lowering
- SDC flow is being controlled at 3200 gpm using FIC-0306, SD CLG HXs Bypass Controller

The control room receives EK-1162, "LPSI PUMP LOW DISCHARGE PRESSURE." Following the alarm's receipt the control room team observes the following indications:

- Red indicating light for P-67A is ON
- SDC Flow is 150 gpm

Which one of the following describes the impact of the above indications and the appropriate action(s) per ONP-17, "Loss of Shutdown Cooling"?

- a. PCS pressure will lower rapidly; TRIP P-67A, LPSI Pump, ONLY.
- b. PCS temperature will begin to rise; START P-67B, LPSI Pump, then TRIP P-67A, LPSI Pump.
- c. PCS pressure will lower rapidly; START P-67B, LPSI Pump, then TRIP P-67A, LPSI Pump.
- d. PCS temperature will begin to rise; TRIP P-67A, LPSI Pump, ONLY.

DISTRACTOR ANALYSIS

- a. The student correctly diagnoses the action but believes that the LPSI pump is helping to maintain PCS pressure. This is plausible because the students are trained that the LPSI pump shutoff head is ~275 psig.
- b. The student correctly diagnoses that PCS temperature will begin to rise but believes that it is acceptable to start the other train LPSI pump when ONP-17 states specifically not to.
- c. The student believes that the LPSI pump is helping to maintain PCS pressure. This is plausible because the students are trained that the LPSI pump shutoff head is ~275 psig. The student also believes that it is acceptable to start the other train LPSI pump when ONP-17 states specifically not to.
- d. **CORRECT - per ONP-17 step 4.2.**

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 006 Emergency Core Cooling

A3.01 - Ability to monitor automatic operation of the ECCS, including: Accumulators

Tier: 2 Group: 1 RO Imp: 4.0

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: SIS_CK20.0

References: LCO 3.5.1; SOP-3 attachment 2

Question:

Given the following:

- The Plant is in MODE 3
- Preparations are being made to perform a critical approach and enter MODE 2

Safety Injection Tank parameters are as follows:

<u>SIT</u>	<u>PRESSURE</u>	<u>LEVEL (%narrow range)</u>	<u>BORON (ppm)</u>
T-82A	207	52	2250
T-82B	217	20	1920
T-82C	219	67	1880
T-82D	215	55	1700

Based on the above parameters, which Safety Injection Tank(s), if any, will NOT be able to perform it's design function if the Plant is placed in MODE 2?

- T-82B AND T-82C ONLY.
- T-82A AND T-82D ONLY.
- T-82C AND T-82D ONLY.
- None, all parameters are within specifications.

DISTRACTOR ANALYSIS

- Plausible because the student may believe that level in both T-82B and C are both too low.
- Plausible because the student may believe that both boron in T-82A is too high and T-82D is too low. It is also plausible that the student may believe that pressure in T-82A is too low.
- CORRECT - Level must be between 14 - 66% and boron must be between 1720 - 2500ppm. This question matches the K/A because SITs are passive components and if SIT pressure is not within the required tech spec range, they will not properly perform their function when automatically injected into the core.**
- Plausible because the student may believe all tanks meet specifications.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 007 Pressurizer Relief/Quench Tank

A4.04 - Ability to manually operate and/or monitor in the control room: PZR vent valve

Tier: 2 Group: 1 RO Imp: 2.6

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PRV_CK08.0

References: E-256, sheet 4

Question:

Following a Large Break Loss of Coolant Accident, the Pressurizer is being vented to the Quench Tank in accordance with EOP Supplement 26, "PCS Void Removal," using PRV-1069, Pressurizer Vent Valve. Which one of the following describes the effect of a temporary loss of DC power to PRV-1069?

PRV-1069 will _____ (1) _____ upon loss of power and will _____ (2) _____ when power is restored.

- a. (1) close
(2) remain closed
 - b. (1) close
(2) open
 - c. (1) remain open
(2) close
 - d. (1) remain open
(2) remain open
-
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible if the student is not aware of the RESET feature of the valve.
 - c. Plausible if the student incorrectly applies the RESET feature of the valve.
 - d. Plausible if the student believes that loss of power does not effect the valve.
-
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 008 Component Cooling Water

G2.4.4 - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures

Tier: 2 Group: 1 RO Imp: 4.5
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTF_CK05.0

References: ONP-6.2, step 4.3

Question:

With the Plant on line at full power, a loss of Component Cooling Water event occurs. Which one of the following meets a condition for tripping the Reactor in accordance with ONP-6.2, "Loss of Component Cooling"?

- a. EK-0908, "PRI COOLANT PUMP P-50B HI TEMP OVERLOAD" annunciates due to bearing temperature.
 - b. EK-0703, "LETDOWN HT EX TUBE OUTLET HI TEMP" annunciates.
 - c. CCW flow to Containment is lost for 2 minutes.
 - d. EK-0954, "ROD DRIVE SEAL LEAK OFF HI TEMP" annunciates due to seal leak off temperature for Control Rod 41.
-
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible but the Demineralizers in the CVCS system can be bypassed.
 - c. Plausible but CCW flow must be lost for 10 minutes before a reactor trip is required.
 - d. Plausible but all or most of the CRDM leak off temperatures must be in alarm (>200°F).
-
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 008 Component Cooling Water

K1.04 - Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: RCS, in order to determine source(s) of RCS leakage into the CCWS

Tier: 2 Group: 1 RO Imp: 3.3
Applicable 10CFR55 Section: 41.3

Palisades Learning Objective: PCP_E03.04

References: ONP-23.1 section 4.9.g; Cause and Effect for CC05 malfunction

Question:

The Plant is in MODE 3 at normal operating temperature and pressure when the following conditions are noted:

- T-3, Component Cooling Water (CCW) Surge Tank, level is rising 2% per minute
- RIA-0915, CCW Radiation Monitor, counts 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?

- a. P-50A Lower Seal pressure rises to PCS pressure.
 - b. P-50A Lower Seal temperature rises by 10°F.
 - c. P-50A Cooling Water Outlet temperature lowers by 10°F.
 - d. P-50A Lower Seal temperature lowers by 10°F.
-

DISTRACTOR ANALYSIS

- a. Plausible but 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: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 010 Pressurizer Pressure Control

K2.02 - Knowledge of bus power supplies to the following: Controller for PZR spray valve

Tier: 2 Group: 1 RO Imp: 2.5

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PPCS_CK07.0

References: ONP-24.1, section 1.0

Question:

Given the following:

- The Plant is operating at full power
- PIC-0101A, 'A' Channel Pressurizer Pressure Controller, is in service

Which one of the following lists the power supply to PIC-0101A and the effect of a loss of power to PIC-0101A?

- Preferred AC Bus Y10, PCS pressure lowers.
 - Preferred AC Bus Y30, PCS pressure lowers.
 - Preferred AC Bus Y10, PCS pressure rises.
 - Preferred AC Bus Y30, PCS pressure rises.
-
-

DISTRACTOR ANALYSIS

- Correct power supply, wrong effect.
 - Wrong power supply, wrong effect.
 - CORRECT**
 - Wrong power supply, correct effect.
-
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 012 Reactor Protection

K3.01 - Knowledge of the effect that a loss or malfunction of the RPS will have on the following: CRDS

Tier: 2 Group: 1 RO Imp: 3.9

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: RPS_CK09.0

References: E-17, sheet 20; E-17, sheet 9; E-121, sheet 2

Question:

Given the following conditions with the Plant operating at full power:

- PIC-0751C, E-50A Steam Generator Low Pressure Channel CKT #3, on panel C-12 has failed low
- PA-0751C, S/G Low Pressure Trip Unit Channel 'C', on Reactor Protection System (RPS) Panel C-06, has been bypassed

Which one of the following describes (1) The current channel trip logic for RPS and (2) The effect on the Reactor, if any, if PIC-0751A, E-50A Steam Generator Low Pressure Channel CKT #1, fails low?

- a. (1) Channel trip logic is now 1 out of 3
(2) The Reactor will NOT trip
- b. (1) Channel trip logic is now 1 out of 3
(2) The Reactor will trip
- c. (1) Channel trip logic is now 2 out of 3
(2) The Reactor will NOT trip
- d. (1) Channel trip logic is now 2 out of 3
(2) The Reactor will trip

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that bypassing a channel causes the logic to be 1/3 and also believes that a S/G pressure indicator failing low will not cause the reactor to trip.
- b. Plausible if the student believes that bypassing a channel causes the logic to be 1/3 and correctly diagnoses that the reactor will trip.
- c. Plausible if the student correctly diagnoses that trip logic is 2/3 but believes that the reactor will not trip because an additional failure is required.
- d. **CORRECT - With one channel of RPS bypassed, trip logic is 2 out of 3. When the second PIC fails low, the MSIVs will close on low S/G pressure causing an automatic reactor trip.**

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 013 Engineered Safety Features Actuation

K4.05 - Knowledge of ESFAS design feature(s) and/or interlock(s) which provide for the following: Core spray actuation signal reset

Tier: 2 Group: 1 RO Imp: 4.0
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CSS_CK09.0

References: E-251 sheet 1 and 1A

Question:

Given the following conditions:

- A small break LOCA has occurred
- Safety Injection has actuated
- Containment pressure rose to 8.5 psig and has since lowered to 1.0 psig
- The CHP signal is RESET
- The Reactor Operator has placed the Containment Spray Pump hand switches in TRIP and returned them to mid-position
- The Containment Spray valves are closed

If the PCS break size gets larger causing Containment Pressure to rise and exceed the Containment High Pressure (CHP) actuation setpoint, how will the Containment Spray System respond?

- a. Containment Spray valves will open.
Containment Spray pumps will NOT start.
 - b. Containment Spray valves will open.
Containment Spray pumps will start.
 - c. Containment Spray valves will NOT open.
Containment Spray pumps will NOT start.
 - d. Containment Spray valves will NOT open.
Containment Spray pumps will start.
-

DISTRACTOR ANALYSIS

- a. **CORRECT** - When the handswitch was taken to "TRIP", the SIS "ARM" signal was removed, the pump would not have started for this condition unless SIS was reset when pressure rose above 1687 psia.
 - b. Student misapplies the reset criteria.
 - c. Student misapplies the reset criteria.
 - d. Student misapplies the reset criteria.
-

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 013 Engineered Safety Features Actuation

K5.02 - Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability

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

Palisades Learning Objective: SIS_E04.03

References: E-17, sheet 3

Question:

Given the following conditions:

- The Plant is being cooled down and depressurized in preparation for a refueling outage
- Safety Injection has been BLOCKED
- A failure of the Pressurizer pressure controller causes PCS pressure to rise from 1550 psia to the following:
 - A Channel - 1700 psia
 - B Channel - 1685 psia
 - C Channel - 1695 psia
 - D Channel - 1705 psia

Based on the above conditions, the Safety Injection Signal is:

- a. no longer blocked since 3/4 pressure channels have increased above the reset setpoint. Safety Injection WILL actuate when pressure is lowered to <1605 psia.
- b. no longer blocked since 3/4 pressure channels have increased above the reset setpoint. Safety Injection WILL actuate when pressure is lowered to <1690 psia.
- c. still blocked since not all of the pressure channels have increased above the reset setpoint. Safety Injection WILL NOT actuate when pressure is lowered.
- d. still blocked since the block switches have not been placed to RESET. Safety Injection WILL NOT actuate when pressure is lowered.

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Student is correct that signal is no longer blocked but misapplies the setpoint of initiation.
- c. Student misapplies the reset logic, in that all 4 do not have to rise above 1690.
- d. Student believes that SIS block must be reset with the switch but it automatically resets on pressure.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 022 Containment Cooling

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

Tier: 2 Group: 1 RO Imp: 4.1

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAB_E01.03

References: EOP-1.0, step 9

Question:

Which one of the following would indicate that a contingency action is required to be taken during the performance of EOP-1.0, "Standard Post Trip Actions"?

- a. EK-1362, "CONTAINMENT PRESSURE OFF NORMAL," annunciates and Containment pressure indicates 4.2 psig.
 - b. EK-0546, "PREFERRED AC BUS NO 4 TROUBLE," annunciates and Preferred AC Bus Y40 is de-energized.
 - c. EK-1351, "CONTAINMENT SUMP HI LEVEL," annunciates and Containment Sump level indicates 585.5 feet.
 - d. EK-0962, "STEAM GEN E-50A LO LEVEL," annunciates and 'A' Steam Generator level indicates 40%.
-
-

DISTRACTOR ANALYSIS

- a. **CORRECT - EOP-1.0 requires contingency actions to be taken if Cont. Pressure reaches 4.0 psig.**
 - b. Plausible but EOP-1.0 requires 3/4 Preferred AC buses and there are no contingency actions if more than one bus was lost.
 - c. Plausible as this would indicate a PCS leak but there are no contingencies for sump level.
 - d. Plausible but contingency action is not required until 5%.
-
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 026 Containment Spray

A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Containment pressure

Tier: 2 Group: 1 RO Imp: 3.9

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: TBAD_E09.01

References: EOP-6.0, step 28

Question:

Given the following:

- A Main Steam Line Break has occurred inside Containment
- Containment Spray has actuated
- Containment pressure rose to 10 psig and is now lowering
- Operators are evaluating when Containment Spray may be secured

As Containment pressure lowers, which one of the following is the earliest allowable pressure at which all Containment Spray may be secured?

- a. 3.5 psig.
 - b. 2.5 psig.
 - c. 1.5 psig.
 - d. 0.8 psig.
-

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that spray can be secured as soon as pressure is less than the CHP setpoint.
 - b. **CORRECT**
 - c. Plausible if the student misapplies the maximum pressure limit.
 - d. Plausible as this is a pressure for a contingency in EOP-1.0.
-

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

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 039 Main and Reheat Steam

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

Tier: 2 Group: 1 RO Imp: 3.4
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: MSS_CK13.0

References: M-207, sheet 1; EOP-1.0, step 8

Question:

The following conditions exist:

- A Plant trip from 100% power occurs
- 386AST, Turbine Trip Relay, does NOT actuate when the turbine trips
- All other equipment functions as designed

Which one of the following describes the effect on the Plant and the appropriate action?

- a. Atmospheric Dump Valves ONLY do NOT open. Verify Steam Generator Code Safety Valves are controlling Steam Generator pressure.
- b. Atmospheric Dump Valves ONLY do NOT open. Ensure PIC-0511, Turbine Bypass Valve Controller, is controlling Steam Generator pressure.
- c. Atmospheric Dump Valves and Turbine Bypass Valve do NOT open. Verify Steam Generator Code Safety Valves are controlling Steam Generator pressure.
- d. Atmospheric Dump Valves and Turbine Bypass Valve do NOT open. Place HIC-0780A, Steam Dump Controller, in MANUAL to control Steam Generator pressure.

DISTRACTOR ANALYSIS

- a. Correct effect but student may believe that the MSIVs close which would actuate the S/G code safety valves.
- b. **CORRECT - 386AST actuation is required for ADVs to quick open or modulate in AUTO. EOP-1.0 specifies using the Turbine Bypass Valve.**
- c. Turbine Bypass Valve will still open, 386AST is not required to actuate as long as pressure is > 900 psia.
- d. Turbine Bypass Valve will still open, 386AST is not required to actuate as long as pressure is > 900 psia.

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: MODIFIED - Palisades 2008 NRC RO Exam #11

K/A: 039 Main and Reheat Steam

A3.02 - Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS

Tier: 2 Group: 1 RO Imp: 3.1

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: MSS_CK09.0

References: EOP Supplement 6

Question:

Given the following:

- The Plant is in MODE 1 at full power
- A Steam Line Rupture occurs inside the Containment Building
- Containment pressure indicates 5.7 psig
- 'A' Steam Generator (S/G) Pressure indicates 480 psia
- 'B' Steam Generator (S/G) Pressure indicates 545 psia

Which one of the following describes the expected response of the Main Steam Isolation Valves (MSIVs) and Feed Regulating Valves (FRVs) to this event?

- a. BOTH 'A' and 'B' S/G MSIVs close.
BOTH 'A' and 'B' S/G FRVs close.
 - b. BOTH 'A' and 'B' S/G MSIVs close.
ONLY 'A' S/G FRV closes.
 - c. ONLY 'A' S/G MSIV closes.
BOTH 'A' and 'B' S/G FRVs close.
 - d. ONLY 'A' S/G MSIV closes.
ONLY 'A' S/G FRV closes.
-
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible because a low S/G pressure (<512 psia) will close only the affected S/G FRV, however a CHP (>4.0psig) will close both S/G FRVs.
 - c. Plausible if the student believes that low S/G pressure closes only the affected S/G MSIV but both FRVs.
 - d. Plausible if the student believes that low S/G pressure closes only the affected S/G MSIV and affected FRV.
-
-

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

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:

Given the following conditions:

- A Plant trip from full power occurs
- Steam Generator Water Level Control was in AUTO at the time of the trip
- NO operator actions have been taken.

As a result, both Steam Generator Water Level Control (SGWLC) controllers, LIC-0701 and LIC-0703, will _____ (1) _____ and the Feed Regulating Valves _____ (2) _____.

- a. (1) transfer to MANUAL
(2) will automatically close
 - b. (1) transfer to MANUAL
(2) must be closed by the Operator
 - c. (1) remain in AUTO
(2) will automatically close
 - d. (1) remain in AUTO
(2) must be closed by the Operator
-

DISTRACTOR ANALYSIS

- a. Plausible because the MFPs automatically ramp to minimum speed, student misapplies this.
 - b. **CORRECT**
 - c. Plausible because the MFPs automatically ramp to minimum speed, student misapplies this .
 - d. Plausible because this is an EOP operator action.
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 061 Auxiliary/Emergency Feedwater

K6.01 - Knowledge of the effect of a loss or malfunction of the following will have on the AFW components:
Controllers and Positioners.Tier: 2 Group: 1 RO Imp: 2.5
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: AFW_CK16.0

References: E-17, sheet 21A

Question:

Given the following conditions:

- The Control Room has been evacuated due to a fire
- C-150, Auxiliary Hot Shutdown Panel, has been placed in service

As a result of placing C-150 in service, AFW Pump P-8B:

- a. will NOT automatically trip on low suction pressure.
 - b. will NOT be available as a source of feedwater.
 - c. automatic speed control is disabled.
 - d. overspeed trip protection is disabled.
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible if the student believes that P-8B cannot be controlled from C-150
 - c. Plausible if the student believes that electrical power is required for speed control of P-8B.
 - d. Plausible if the student believes that electrical power is required for overspeed protection.
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 062 AC Electrical Distribution

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

Tier: 2 Group: 1 RO Imp: 4.1
Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: EDG_CK09.0

References: E-17 Sheet 9

Question:

Given the following conditions:

- The Plant is operating at 25% power
- Emergency Diesel Generator 1-1 is loaded to 2450 kW in PARALLEL with Safeguards Transformer 1-1
- A Reactor trip occurs

Based on the above conditions, EDG 1-1 output breaker, 152-107, will:

- a. remain closed with load at 2450 kW.
 - b. immediately open and reclose after load shed.
 - c. immediately open and remain open.
 - d. remain closed unless a Safety Injection Signal occurs.
-

DISTRACTOR ANALYSIS

- a. Student believes that plant trip has no effect on the Diesel Generator.
 - b. Student believes that Safeguards Transformer is lost and Diesel will sequence back on.
 - c. **CORRECT**
 - d. Student confuses with the DBA sequencer.
-

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

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 062 AC Electrical Distribution

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

Tier: 2 Group: 1 RO Imp: 3.3

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: IOTA_T07.00

References: GOP-9 attachment 1, step 2.9; E-1 sheet 1

Question:

Given the following conditions:

- A Plant cooldown is in progress in accordance with GOP-9, "MODE 3 \geq 525°F TO MODE 4 OR MODE 5"
- Two (2) diametrically opposed Primary Coolant Pumps (PCPs) are to be secured
- One (1) Condensate Pump is to be secured

Which one of the following combinations of PCPs and Condensate Pumps will be left in service to distribute the load as evenly as possible between 4160VAC Buses 1A and 1B AND satisfy the above requirements?

	Primary Coolant Pumps	Condensate Pump
a.	P-50A P-50C	P-2A
b.	P-50A P-50D	P-2B
c.	P-50B P-50C	P-2B
d.	P-50B P-50D	P-2A

DISTRACTOR ANALYSIS

- a. This satisfies the requirement for diametrically opposed PCPs but all of these loads are powered from 4160V bus 1A.
- b. This satisfies the requirement to distribute load evenly but P-50A and P-50D are not diametrically opposed.
- c. This satisfies the requirement to distribute load evenly but P-50B and P-50C are not diametrically opposed.
- d. **CORRECT**

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 063 DC Electrical Distribution

K3.02 - Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following:
Components using DC control powerTier: 2 Group: 1 RO Imp: 3.5
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: EDG_CK06.0

References: ONP-2.3, attachment 8

Question:

A DC Bus ground has occurred causing the fuse supplying D21A, 125 VDC Distribution Panel, to actuate and open. Which one of the following describes an expected consequence of this failure?

- a. MO-2160, SIRWT to Charging Pumps, opens and MO-2087, VCT Outlet, closes.
 - b. Automatic start for Emergency Diesel Generator 1-1 on bus undervoltage is lost.
 - c. All breakers on Bus 1D must be manually operated.
 - d. All control room annunciators are lost.
-

DISTRACTOR ANALYSIS

- a. This is the effect of a loss of Y01, Instrument AC Bus.
 - b. This is the effect from a loss of D21-1.
 - c. **CORRECT**
 - d. This is the effect from a loss of D-21-2.
-

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

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 064 Emergency Diesel Generator

K4.11 - Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: Automatic load sequencer: safeguards

Tier: 2 Group: 1 RO Imp: 3.5
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBAR_TBCORE_CP02.0

References: E-17, sheet 4

Question:

Following an Excess Steam Demand Event due to a Steam Line Break inside the Containment, the following conditions exist:

- The Reactor is manually tripped
- Containment pressure reaches 4.4 psig
- Bus 1C de-energizes, load shed completes, EDG 1-1 output breaker, 152-107, closes
- Bus 1D is being powered by the Safeguards Transformer

Which one of the following describes the Sequencer, if any, that is operating?

- a. Left Channel DBA Sequencer is operating.
NO Right Channel Sequencer is operating.
 - b. Left Channel DBA Sequencer is operating.
Right Channel DBA Sequencer is operating.
 - c. Left Channel NSD Sequencer is operating.
Right Channel NSD Sequencer is operating.
 - d. Left Channel NSD Sequencer is operating.
NO Right Channel Sequencer is operating.
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible if the student believes that the right channel will actuate due to the CHP signal and disregards the fact that bus 1D is not lost.
 - c. Same reason as 'b' above and the student also believes that an SIS signal is not received.
 - d. Student believes that an SIS signal is not received.
-

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 064 Emergency Diesel Generator

K6.08 - Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks

Tier: 2 Group: 1 RO Imp: 3.2
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: EDG_CK13.0

References: SOP-22 attachments 2 and 3 (PROVIDE)

Question:

Given the following conditions:

- The Plant has experienced a loss of all offsite power
- Emergency Diesel Generator (EDG) 1-1 is loaded to 2200 kW
- EDG 1-2 is NOT available
- T-10A, Fuel Oil Storage Tank, level is 91" by dipstick
- There is an unrecoverable leak of 1.1 gpm from T-10A

For the above conditions, how long will T-10A inventory be able to support EDG 1-1 operation?

- a. 6.1 days.
- b. 6.8 days.
- c. 8.8 days.
- d. 9.0 days.

DISTRACTOR ANALYSIS

- a. **CORRECT** - EDG uses ~2.57 gpm @ 2200 kW(from attachment 2)+ 1.1 gpm for leak = 3.67gpm. 32500 usable gallons(from attachment 3)/3.67 gpm = 6.1 days.
- b. Student adds 15 hours from the day tank.
- c. Student does not take into account 1.1 gpm leak.
- d. Student misreads the attachment 3 graph and uses 91% instead of 91 inches.

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 2006 RO NRC Exam #53

K/A: 073 Process Radiation Monitoring

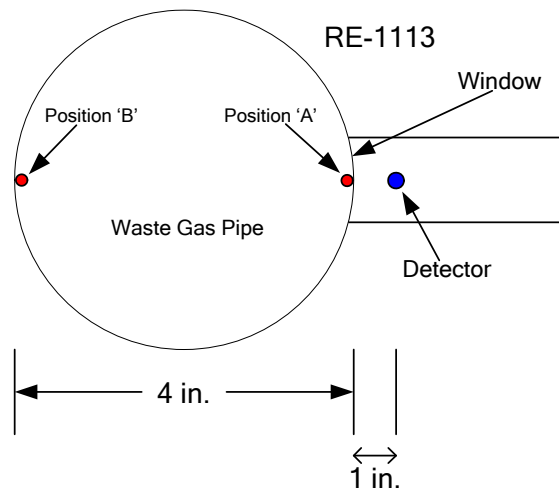
K5.02 - Knowledge of the operational implications as they apply to concepts as they apply to the PRM system:
Radiation intensity changes with source distanceTier: 2 Group: 1 RO Imp: 2.5
Applicable 10CFR55 Section: 41.12

Palisades Learning Objective: None

References: Basic Radiation Worker Training (RWT)

Question:

RE-1113, Waste Gas Process Monitor radiation element, consists of a detector mounted on one side of the Waste Gas discharge pipe with a window through the pipe wall, with the pipe 4 inches in diameter (see below). The detector is a point detector located 1 inch from the ID of the pipe.



Compare the differences in radiation readings for a hot particle that passes along the side of the pipe closest to the detector (Position 'A' above) to the same hot particle that passes along the side of the pipe farthest away from the detector (Position 'B' above).

The radiation reading at Position 'A' will be _____ greater than the reading at Position 'B'.

- 4 times
- 5 times
- 16 times
- 25 times

DISTRACTOR ANALYSIS

- Uses linear proportionality and does not account for the inch.
- Uses linear proportionality.
- Uses correct proportionality (squared) but does not account for the inch.
- CORRECT** - Dose is proportional to the square of the distance. A count rate of 25 dpm at 1 inch would be equivalent of a count rate of 1 dpm at 5 inches.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 076 Service Water

A1.02 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures

Tier: 2 Group: 1 RO Imp: 2.6

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: SWS_CK13.0

References: SOP-5, section 5.2.3

Question:

Given the following:

- The Plant is operating at full power
- No Equipment is out of service
- P-7A and P-7C, Service Water Pumps, are in service
- All Containment Air Cooler (CAC) High Capacity SW Outlet Valves are open
- Lake Michigan water temperature has steadily risen over the last few hours from 68°F to 80.5°F

As Lake Michigan water temperature rises, Service Water Pump discharge pressure will _____ (1) _____ and _____ (2) _____ as necessary to prevent components from overheating.

- a. (1) rise
(2) P-7B, Service Water Pump, will be started
 - b. (1) rise
(2) CAC High Capacity SW Outlet valves will be closed
 - c. (1) lower
(2) P-7B, Service Water Pump, will be started
 - d. (1) lower
(2) CAC High Capacity SW Outlet valves will be closed
-

DISTRACTOR ANALYSIS

- a. Incorrect effect, correct action.
 - b. Incorrect effect, incorrect action.
 - c. **CORRECT - Temperature control valves open to maintain temperatures so discharge pressure lowers.**
 - d. Correct effect, incorrect action.
-

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 076 Service Water

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

Tier: 2 Group: 1 RO Imp: 3.5

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: TBAB_E01.03

References: EOP-1.0, immediate action 11, EOP-1.0 basis step 11

Question:

Given the following after a Plant trip due to a loss of all off site power:

- EOP-1.0, "Standard Post Trip Actions," are in progress
- Bus 1D is being supplied by EDG 1-2; Bus 1C is de-energized
- P-7C, Service Water Pump, is in service with Critical Service Water header pressure indicating 35 psig
- P-52B, Component Cooling Water Pump, is in service with CCW Header Pressure indicating 98 psig
- P-7A, Service Water Pump, is out of service for shaft replacement
- A Safety Injection Actuation Signal (SIAS) is NOT present

Which one of the following describes the operational concern due to the above conditions and the correct action to take?

- a. Possible Service Water Pump damage due to runout. Close Containment Air Cooler high capacity outlet valves to raise critical Service Water pressure > 42 psig.
- b. Possible Component Cooling Water Pump damage due to runout. Close CV-0944A, CCW Supply to SFP HXs, RW Evaporators, and C-50/54.
- c. Possible Service Water Pump damage due to runout. Start P-7B, Service Water Pump, to raise Critical Service Water pressure > 42 psig.
- d. Possible Component Cooling Water Pump damage due to runout. Close CV-0910, CV-0911, and CV-0940, CCW Supply to and from Containment.

DISTRACTOR ANALYSIS

- a. **CORRECT - Operators are expected to know immediate actions from memory.**
- b. Plausible if student believes that 98 psig CCW header pressure is a threshold for an EOP-1.0 contingency action. This pressure is less than normal (120 psig) but not alarming (80 psig). Closing CV-0944A would restore pressure.
- c. Correct Effect, however P-7B has no power available due to bus 1C being de-energized.
- d. Plausible if student believes that 98 psig CCW header pressure is a threshold for an EOP-1.0 contingency action. This pressure is less than normal (120 psig) but not alarming (80 psig). Closing CCW supply to and from Containment would restore pressure but is not directed unless there is a Containment Isolation.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 078 Instrument Air

A3.01 - Ability to monitor automatic operation of the IAS, including: Air pressure

Tier: 2 Group: 1 RO Imp: 3.1

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: CAS_CK10.0

References: M-212, sheet 1; ARP-7, window 5

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 is currently 90 psig and lowering

Based upon the above Plant conditions, which one of the following describes the response of the Instrument Air System if Instrument Air pressure continues to lower?

Instrument Air Compressors C-2B and C-2C will auto start when Instrument Air header pressure sensed ...

- a. UPstream of the filter and dryer reaches 85 psig.
 - b. DOWNstream of the filter and dryer reaches 85 psig.
 - c. DOWNstream of the filter and dryer reaches 88 psig.
 - d. UPstream of the filter and dryer reaches 88 psig.
-
-

DISTRACTOR ANALYSIS

- a. Plausible if the student confuses the setpoint for automatic service air isolation.
 - b. Plausible if the student confuses the setpoint for automatic service air isolation and the location where pressure is sensed.
 - c. Plausible if the student believes that the standby compressor will start if there is a clogged air dryer or filter.
 - d. **CORRECT**
-
-

Level of Knowledge: LOW

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 078 Instrument Air

A4.01 - Ability to manually operate and/or monitor in the control room: Pressure gauges

Tier: 2 Group: 1 RO Imp: 3.1

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: IOTF_CK05.0

References: ARP-7, window 2; ONP-7.1, Caution prior to step 4.3

Question:

Given the following:

- The Plant is operating at full power
- A leak in the Instrument Air System occurs causing the following alarms:
 - EK-1101, "CONTAINMENT INSTR AIR LO PRESS"
 - EK-1102, "INSTRUMENT AIR LO PRESS"
 - EK-1105, "AIR COMPRESSORS STANDBY COMP RUNNING"
- Instrument Air pressure indicates 82 psig and stable on PIA-1210, Instrument Air Pressure gauge on panel C-13

Which one of the following additional alarms would be expected based on these indications? Assume no operator actions have been taken and Instrument Air pressure remains stable.

- a. EK-3322, "CLG TWR E-30A FIRE."
- b. EK-1134, "MOTOR DRIVEN FIRE PUMP RUNNING."
- c. EK-1171, "COMPONENT CLG HX E-54B LO TEMP."
- d. EK-1165, "NON CRITICAL SERV WATER LO PRESS."

DISTRACTOR ANALYSIS

- a. Plausible because the student could think that the deluge valves fail open on lowering Air pressure but these are actually nitrogen supplied.
- b. **CORRECT - Service Air is automatically isolated when Instrument Air pressure is 85 psig which causes Track Alley and VRS deluge to actuate which will start the Motor Driven Fire Pump.**
- c. Plausible because the Hi-cap valves fail open on loss of instrument air and could overcool the CCW, however, these valves don't fail open until air pressure is 50 psig.
- d. Plausible because this valve is air to open, however, this valve will not close until Instrument Air pressure is nearly zero psig.

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 103 Containment

G2.4.18 - Knowledge of the specific bases for EOPs.

Tier: 2 Group: 1 RO Imp: 3.3

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBAG_TBCORE_CK02.0

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

Question:

During a Loss of Coolant Accident event, the following parameters exist:

- PZR pressure is 1000 psia and lowering
- Containment pressure is 3.2 psig and rising
- Containment temperature is 162°F and rising

A few minutes later Containment Spray actuates and the following parameters are noted:

- PZR pressure is 900 psia and lowering
- Containment pressure is 1.7 psig and lowering
- Containment temperature is 135°F and lowering

Which one of the following describes the use of EOP Supplement 1, Pressure/Temperature Limit Curves, for this event?

- a. Use degraded Containment curves throughout the event because Containment temperature was greater than the upper limit for non-degraded curve use.
- b. Use non-degraded Containment curves throughout the event because Containment temperature and Containment pressure are within the limits.
- c. Use degraded Containment curves throughout the event because Containment pressure was greater than the upper limit for non-degraded curve use.
- d. Use non-degraded Containment curves prior to Containment Spray actuation and degraded Containment curves after Containment Spray actuation.

DISTRACTOR ANALYSIS

- a. Plausible if student misapplies the limit for considering Containment as degraded.
- b. Plausible if student misapplies the limit for considering Containment as degraded.
- c. **CORRECT**
- d. Plausible if the student believes that the use of degraded curves is due to the fact that all the instruments are wet from the containment spray.

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: 001 Control Rod Drive

K6.13 - Knowledge of the effect of a loss or malfunction on the following CRDS components: Location and operation of RPIS

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

Palisades Learning Objective: CRD_CK13.0

References: ARP-5, window 18; DBD-2.06 section 3.3.4-1

Question:

The Plant is at operating at full power. Which one of the following describes the impact on the Control Rod Drive System upon receipt of annunciator EK-0918, "PIP TROUBLE"?

- a. A Rod Withdrawal Prohibit will be generated for the Shutdown and Regulating Control Rods.
 - b. Control Rod position indication will be unavailable from the Palisades Plant Computer.
 - c. A Rod Withdrawal Prohibit will be generated for the Regulating Control Rods ONLY.
 - d. The Regulating Control Rods will have to be manually sequenced if rod motion is necessary.
-

DISTRACTOR ANALYSIS

- a. Plausible because PIP performs rod sequencing, however withdrawal is allowed, they just need to be manually sequenced.
 - b. Plausible because the PPC displays rod positions, however, SPI (reed switch) indication will be available from the PPC.
 - c. Plausible because PIP performs rod sequencing, however withdrawal is allowed, they just need to be manually sequenced.
 - d. **CORRECT**
-

Level of Knowledge: **LOW**

Difficulty: **2**

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 002 Reactor Coolant

G2.1.28 - Knowledge of the purpose and function of major system components and controls

Tier: 2 Group: 2 RO Imp: 4.1

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PCS_CK09.0

References: GOP-9 attachment 1, step 3.8

Question:

For the Low Temperature Overpressure Protection System (LTOP) to perform its design function, it shall be in service prior to PCS ___(1)___ leg temperature reaching ___(2)___ during a normal Plant cooldown.

- a. (1) cold
(2) 480°F
 - b. (1) hot
(2) 480°F
 - c. (1) cold
(2) 430°F
 - d. (1) hot
(2) 430°F
-
-

DISTRACTOR ANALYSIS

- a. Student misapplies the temperature requirement band (430-480).
 - b. Student misapplies the temperature requirement band (430-480) and believes that LTOP receives a temperature signal from the hot leg.
 - c. **CORRECT - GOP-9 states that LTOP is placed in service between 430 and 480 degrees by cold leg temperature.**
 - d. Student believes that LTOP receives a temperature signal from the hot leg.
-
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 1999 NRC Exam #71

K/A: 014 Rod Position Indication

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

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

Palisades Learning Objective: IOTA_T19.0

References: Tech Data Book Figure 1.9 (PROVIDE)

NOTE: The question change identified below with the ~~strikeout~~ and **BOLD underline** were made as a result of an applicant comment during the administration of the written examination.**Question:**

Given the following conditions:

- A rapid power reduction occurred several minutes ago in accordance with ONP-26, "Rapid Power Reduction," and the Plant has stabilized at 80% power
- ONP-26 has been exited
- The Control Room team is attempting to restore control rods to meet Regulating Rod Group insertion limits
- An electrical malfunction results in Group 4 regulating rods becoming stuck at 80 inches

In order for Group 4 Control Rods to be ~~less~~ **greater** than or equal to the Pre Power Dependent Insertion Limit, power must be reduced to a maximum of ...

- a. 33%.
- b. 68%.
- c. 70%.
- d. 74%.

DISTRACTOR ANALYSIS

- a. This corresponds to 80" on Group 3 rods.
- b. **CORRECT**
- c. This is the PPC PDIL value for Group 4.
- d. This is the Tech Spec PDIL value for Group 4.

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

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 029 Containment Purge

A3.01 - Ability to monitor automatic operation of the Containment Purge System including: CPS isolation

Tier: 2 Group: 2 RO Imp: 3.8

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: PVT_CK08.0

References: M-218, sheet 2; E-17, sheet 7

Question:

Given the following:

- The Plant is in MODE 6
- Refueling Operations are in progress in the Containment Building
- A Containment High Radiation Signal is received due to a high alarm from Containment Refueling Monitors, RIA-2316 and RIA-2317

Which one of the following occurs within the Ventilation System as a result of this condition?

- a. V-1B, V-2B, V-3B, and V-4B, Containment Air Cooler Fans, receive a trip signal.
 - b. V-46, Containment Air Room Purge Fan, receives a trip signal.
 - c. VF-66, Refueling Area Charcoal Filter, aligns for operation.
 - d. V-8A/B, Refueling Area Exhaust Fans, receive a trip signal.
-
-

DISTRACTOR ANALYSIS

- a. Plausible if the student confuses actions for a Containment High Pressure signal with CHR.
 - b. **CORRECT**
 - c. Plausible because the containment equipment hatch is open in MODE 6 but this is not an automatic action.
 - d. Plausible because the containment equipment hatch is open in MODE 6 but this is not an automatic action.
-
-

Level of Knowledge: LOW**Difficulty: 4**

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 035 Steam Generator

K3.03 - Knowledge of the effect that a loss or malfunction of the S/GS will have on the following: Secondary systems

Tier: 2 Group: 2 RO Imp: 3.0

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: TBAB_E01.03

References: EOP-1.0, immediate action 8; EOP-1.0 basis step 8

Question:

Given the following:

- A manual Plant trip from full power has occurred in response to a tube rupture in the 'A' Steam Generator
- EOP-1.0, "Standard Post Trip Actions," have been completed
- The Control Room team is transitioning to EOP-5.0, "Steam Generator Tube Rupture Recovery"

Which one of the following describes the strategy for controlling Auxiliary Feedwater flow to the 'A' Steam Generator?

AFW flow to 'A' Steam Generator will be ...

- a. 165 gpm.
 - b. 165 gpm until level is > 60%.
 - c. 165 gpm until level is > 5%.
 - d. 0 gpm.
-
-

DISTRACTOR ANALYSIS

- a. This is the normal programmed flow when AFAS initiates.
 - b. This is the normal programmed flow and the long term strategy for a non-faulted S/G in EOP-1.0.
 - c. This is the normal programmed flow and the initial short term level that is required in EOP-1.0.
 - d. **CORRECT - EOP-1.0 immediate action 8 requires all feedwater flow to a faulted S/G be secured.**
-
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 041 Steam Dump/Turbine Bypass Control

K4.09 - Knowledge of SDS design feature(s) and/or interlock(s) which provide for the following: Relationship of low/low T-ave. setpoint in SDS to primary cooldown

Tier: 2 Group: 2 RO Imp: 3.0
Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: MSS_CK09.0

References: M-207, sheet 1; M-205, sheet 1

Question:

Given the following:

- The Plant was manually tripped in response to a small steam line break from the 'B' Steam Generator
- A Plant cooldown has been commenced using HIC-0780A, Steam Dump Controller, in manual via the Atmospheric Steam Dump Valves (ADV's)
- The Main Steam Isolation Valves are closed
- 386AST, Turbine Trip Relay, has NOT been reset
- T_{AVE} is currently 532°F
- An Operator notices that CV-0511, Turbine Bypass Valve (TBV), is indicating partially open

For the above condition, which one of the following is true for CV-0511?

CV-0511 is expected to be ...

- a. closed because T_{AVE} is $< 535^{\circ}\text{F}$.
- b. partially open because 386AST has not been reset.
- c. closed because Main Steam Pressure is < 900 psia.
- d. partially open because HIC-0780A is sending a signal to the TBV circuit.

DISTRACTOR ANALYSIS

- a. Plausible because this is the T_{AVE} at which the TBV should start to open in AUTO.
- b. Plausible because this relay actuation is what causes the TBV to quick open, however, T_{AVE} is < 556 so this is not the correct reason.
- c. Plausible because this is the Main Steam pressure setpoint for the TBV.
- d. **CORRECT - This matches the K/A because 532°F is the low/low setpoint for T_{AVE} in the SDS.**

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 045 Main Turbine Generator

K5.18 - Knowledge of the operational implications of the following concepts as they apply to the MT/G System:

Purpose of low-power reactor trips (limited to 25% power)

Tier: 2 Group: 2 RO Imp: 2.7

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: SPS_CK09.0

References: E-17, sheet 9, 16

Question:

Given the following:

- The Plant is operating at 13% power
- All 4160V Buses are being supplied by Startup Power
- The Main Generator is synchronized to the grid with load at 100 MW
- Then, the Reactor trips due to a loss of all offsite power

Which one of the following describes an implication of this Reactor trip?

- a. The Main Turbine must be manually tripped on Panel C-01.
- b. The Diesel Generator Output Breakers must be manually closed on Panel C-04.
- c. The Main Steam Reheater Supply Valves will NOT automatically close.
- d. The Primary Coolant Pump coastdown feature will NOT actuate.

DISTRACTOR ANALYSIS

- a. Plausible if the student confuses this with the loss of load trip that is enabled >15% power. The main turbine will auto trip for these conditions.
- b. Plausible because there is an interlock that will trip the EDG output breakers if the reactor trips. Student confuses this condition for that particular interlock.
- c. Plausible because these valves auto ramp based on turbine metal temperature, however, these will still close on a turbine trip in the ramp mode.
- d. **CORRECT - 'A' and 'B' buses must be supplied by the Main Generator for the PCP coastdown feature to operate.**

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 068 Liquid Radwaste

A2.04 - Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of automatic isolation

Tier: 2 Group: 2 RO Imp: 3.3

Applicable 10CFR55 Section: 41.5

Palisades Learning Objective: RMS_CK11.0

References: ARP-8, window 65 and attachment 3 page 4; CH-6.21, attachment 1 and 4

Question:

Given the following:

- A batch release of T-87A, Miscellaneous Waste Distillate Tank, is in progress at the maximum allowable release rate in accordance with SOP-17B, "Dirty Radioactive Waste System"
- P-40A and P-40B, Dilution Water Pumps, are in service
- P-7B and P-7C, Service Water Pumps, are in service
- CH-6.21, "Radioactive Liquid Calculation and Release Authorization," Attachment 1, "Release Authorization," specifies the following:
 - Minimum Dilution Water Pumps: 2
 - Minimum Service Water Pumps: 2

Then, P-40A, Dilution Water Pump, trips.

Which one of the following describes the impact on RIA-1049, Liquid Radwaste Discharge Monitor, for this condition and the correct action?

- a. RIA-1049 high alarm setpoint is too HIGH for the current conditions.
Direct an Auxiliary Operator to close MV-CRW172, RIA-1049 Discharge to Canal.
- b. RIA-1049 high alarm setpoint is too LOW for the current conditions.
Direct an Auxiliary Operator to close MV-CRW172, RIA-1049 Discharge to Canal.
- c. RIA-1049 high alarm setpoint is too HIGH for the current conditions.
Close MO-5311 and MO-5312, Dilution Water to Mixing Basin Isolations.
- d. RIA-1049 high alarm setpoint is too LOW for the current conditions.
Close MO-5311 and MO-5312, Dilution Water to Mixing Basin Isolations.

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible if the student has an incorrect mental model of the effects of lowering dilution water flow while maintaining discharge flow rate constant.
- c. Plausible if the student believes that the radwaste discharge taps in upstream of these valves instead of downstream.
- d. Plausible if the student has an incorrect mental model of the effects of lowering dilution water flow while maintaining discharge flow rate constant and also believes that the radwaste discharge taps in upstream of these valves instead of downstream.

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 075 Circulating Water

A4.01 - Ability to manually operate and/or monitor in the control room: Emergency/essential SWS pumps

Tier: 2 Group: 2 RO Imp: 3.2

Applicable 10CFR55 Section: 41.7

Palisades Learning Objective: SWS_CK24.0

References: E-17, sheet 4

Question:

Given the following with the Plant operating at full power:

- P-7A and P-7B, Service Water Pumps, are in service
- Maintenance on P-7C, Service Water Pump, has just been completed
- 152-205, P-7C Breaker, has been racked in with control power fuses installed
- P-7C is NOT in Standby
- A Plant trip occurs due to a loss of all off site power
- Both Diesel Generators start and sequence 2400VAC Buses 1C and 1D per design

Which one of the following describes the status of the Service Water Pumps?

- a. P-7A and P-7B in service. P-7C will start if header pressure lowers to < 40 psig.
 - b. P-7A and P-7B in service. P-7C will start if there is a Safety Injection Signal.
 - c. P-7A and P-7B in service. P-7C will start if placed in Standby.
 - d. ALL three Service Water Pumps will be in service.
-
-

DISTRACTOR ANALYSIS

- a. Plausible because the standby pump will start if discharge pressure of either 2 in service pumps lowers to < 40 psig.
 - b. Plausible because all 3 SW pumps receive a start signal on SIS.
 - c. Plausible if the student believes that the NSD sequencer will only start the pump if it is in Standby.
 - d. **CORRECT**
-
-

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 086 Fire Protection

K1.03 - Knowledge of the physical connections and/or cause-effect relationships between the Fire Protection System and the following systems: AFW system

Tier: 2 Group: 2 RO Imp: 3.4
Applicable 10CFR55 Section: 41.4

Palisades Learning Objective: FPS_CK06.0

References: EOP-7.0, steps 8 and 17

Question:

Given the following:

- The Plant has experienced a loss of all feedwater event
- EOP-7.0, "Loss of All Feedwater Recovery," is the in use procedure
- P-8A, Auxiliary Feedwater Pump, is available
- Main Feedwater is NOT available
- T-2, Condensate Storage Tank, is NOT available
- Preparations are being made to place P-8A in service using EOP Supplement 31, "Supply AFW Pumps From Alternate Sources"

Which one of the following will be (1) the source of water to P-8A and (2) the approximate level in which flow to the Steam Generators will be initiated?

- a. (1) Fire Protection System.
(2) -125%.
- b. (1) Service Water System.
(2) -125%.
- c. (1) Fire Protection System.
(2) -75%.
- d. (1) Service Water System.
(2) -75%.

DISTRACTOR ANALYSIS

- a. Correct source of water but incorrect level, this is the level at which a S/G is considered dry.
- b. Incorrect source of water, this is a backup to P-8C. Incorrect level, this is the level at which a S/G is considered dry.
- c. **CORRECT**
- d. Correct level, incorrect source of water, this is a backup to P-8C.

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: G2.1.19 - Ability to use plant computers to evaluate system or component status.

Tier: 3 Group: RO Imp: 3.9

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: PPC_CK08.0

References: PPC Users Manual, chapter 5

Question:

You are monitoring Plant status using the Plant Process Computer (PPC) when you notice a parameter value is displayed in orange (see example below).

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This color signifies that the parameter value ...

- a. has exceeded its "Alarm" setpoint.
 - b. has exceeded its "Warning" setpoint.
 - c. is bad data or out of range.
 - d. was manually entered.
-
-

DISTRACTOR ANALYSIS

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

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

WRITTEN QUESTION DATA SHEET

Source of Question: MODIFIED - Palisades 2008 NRC RO Exam #66

K/A: G2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.

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

Palisades Learning Objective: AFW_E04.01

References: SOP-12, attachment 16 (PROVIDE ONLY page 2)

Question:

Given the following conditions:

- The Plant is at full power
- T-2, Condensate Storage Tank, temperature is 80°F
- T-81, Primary System Makeup Storage Tank, temperature is 100°F
- Auxiliary Feedwater flow will be initiated to BOTH Steam Generators at the programmed value for an Auxiliary Feedwater Actuation (AFAS)

Heat Balance power must be lowered to a maximum of (1) prior to initiating Auxiliary Feedwater flow because (2) .

- a. (1) 99.3%
(2) AFW flow is not a parameter used to calculate heat balance power
- b. (1) 99.3%
(2) AFW temperature input is out of range for the heat balance power calculation
- c. (1) 99.2%
(2) AFW flow is not a parameter used to calculate heat balance power
- d. (1) 99.2%
(2) AFW temperature input is out of range for the heat balance power calculation

DISTRACTOR ANALYSIS

- a. Correct reason, however, this is the power if T-81 temperature is used.
- b. Wrong reason and this is the power if T-81 temperature is used.
- c. **CORRECT**
- d. Correct power level but wrong reason.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: G2.1.40 - Knowledge of refueling administrative requirements

Tier: 3 Group: RO Imp: 2.8

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: IOTD_K14

References: GCL-11.2, section 1.1.8

Question:

During refueling operations, which one of the following Spent Fuel Pool (SFP) water levels is the LOWEST allowable level for performing irradiated fuel handling activities in the SFP?

- a. 8" below skimmers.
 - b. 10" below skimmers.
 - c. 12" below skimmers.
 - d. 14" below skimmers.
-
-

DISTRACTOR ANALYSIS

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

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades**K/A:** G2.2.7 - Knowledge of the process for conducting special or infrequent tests.**Tier:** 3 **Group:** **RO Imp:** 2.9**Applicable 10CFR55 Section:** 41.10**Palisades Learning Objective:** APPR_E01.05**References:** EN-OP-116, attachment 9.1

Question:

Which one of the following activities does NOT require an Infrequently Performed Test or Evolution Brief in accordance with EN-OP-116, "Infrequently Performed Tests or Evolutions"?

- a. Securing Dilution Water Pump, P-40A, at 100% power.
 - b. Overspeed Trip test of Emergency Diesel Generator 1-1.
 - c. Performance of Containment Integrated Leak Rate Test.
 - d. Cutting of Incore Instruments in the Reactor Cavity.
-
-

DISTRACTOR ANALYSIS

- a. **CORRECT**
 - b. Plausible because the student thinks EDG testing is performed frequently.
 - c. Plausible because the student thinks that the test relies heavily on engineering.
 - d. Plausible because the student thinks that this is usually performed by a vendor (Westinghouse).
-
-

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

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: G2.2.43 - Knowledge of the process used to track inoperable alarms

Tier: 3 Group: RO Imp: 3.0

Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: APCO_E13.01

References: ADMIN 4.00, attachment 5, section 3.0

Question:

Which one of the following correctly describes how inoperable Control Room alarms are tracked?

The inoperable alarm shall be documented ...

- a. on the SRO Turnover Sheet ONLY.
 - b. via an "Alarm Tab" for identification ONLY.
 - c. on the SRO Turnover Sheet AND the NCO Turnover Sheet.
 - d. in the Operations Log AND on the NCO Turnover Sheet.
-
-

DISTRACTOR ANALYSIS

- a. Plausible but not tracked on the SRO T/O sheet.
 - b. Alarm Tabs are used to identify expected alarms.
 - c. Plausible but not tracked on the SRO T/O sheet.
 - d. **CORRECT**
-
-

Level of Knowledge: LOW

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.2.44 - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions

Tier: 3 Group: RO Imp: 4.2

Applicable 10CFR55 Section: 41.5

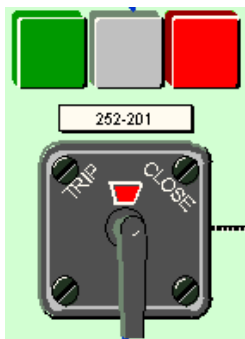
Palisades Learning Objective: SPS_CK02.0

References: E-17 Sh 19; E-131 Sh 1G; E-129 Sh 1, 1A

Question:

Given the following during a normal Plant shutdown:

- An Operator is preparing to transfer 4160VAC Buses from Station Power to Startup Power
- Breaker 252-201, Bus 1B Station Power Incoming Breaker, indicating lights on panel C-04 are as follows (see picture below):
 - RED light is lit
 - GREEN light is NOT lit
 - WHITE light is NOT lit



Which one of the following describes the response when 252-202, Bus 1B Startup Power Incoming Breaker, control switch is positioned to CLOSE? (Assume all bulbs and fuses are good)

- a. 252-201 will NOT trip to transfer bus. 252-201 will need to be tripped locally.
- b. 252-201 will trip to transfer bus but 252-202 will NOT close; Bus 1B will de-energize.
- c. 252-201 will trip to transfer bus but will NOT be able to be closed remotely from C-04.
- d. 252-201 will trip to transfer bus and will be able to be closed remotely from C-04.

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that Charging power (white light) is required to trip breaker.
- b. Plausible if the student believes that breaker will trip but that the white light powers circuitry for the logic that allows 252-202 to close.
- c. **CORRECT**
- d. Plausible if the student believes that there will be one more breaker cycle left, which may be true, however, in this case it is not.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 2008 NRC RO Exam #52

K/A: G2.3.11 - Ability to control radiation releases

Tier: 3 Group: RO Imp: 3.8

Applicable 10CFR55 Section: 41.11

Palisades Learning Objective: RMS_E03.01

References: SOP-18A, 7.5.d

Question:

A Waste Gas Decay Tank batch release is planned, but the Waste Gas Monitor, RIA-1113, is INOPERABLE.

For this condition, all of the following are actions that are required prior to initiating the release EXCEPT:

- a. Obtain an additional sample of the tank contents.
 - b. Perform an independent verification of the discharge lineup.
 - c. Perform independent verification of the release rate calculations.
 - d. Setup local portable monitoring equipment at release point.
-
-

DISTRACTOR ANALYSIS

- a. A valid alternative/compensatory action.
 - b. A valid alternative action.
 - c. A valid compensatory action.
 - d. **CORRECT**
-
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: G2.3.15 - Knowledge of 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: 41.12

Palisades Learning Objective: RMS_CK06.0

References: M-218, sheet 2; M-223 sheet 1A

Question:

The Containment Gas Radiation Monitor, RIA-1817, is normally lined up to sample from the:

- a. Containment Dome.
 - b. Containment Air Room.
 - c. Containment Air Cooler Fan discharge.
 - d. Control Rod Drive Motor Cooling Fan discharge.
-
-

DISTRACTOR ANALYSIS

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

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

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

Tier: 3 Group: RO Imp: 4.0
Applicable 10CFR55 Section: 41.10

Palisades Learning Objective: TBCORE_CK01.0

References: EOP-1.0 immediate action 5

Question:

Given the following:

- A Loss of Coolant Accident (LOCA) has occurred with the Plant in MODE 1
- Containment Isolation has actuated due to high Containment Pressure
- EOP-1.0, "Standard Post Trip Actions," are in progress

Which one of the following Pressurizer Level conditions will satisfy the Inventory Control (IC) safety function?

- a. 60% and rising.
 - b. 26% and rising.
 - c. 40% and lowering.
 - d. 88% and lowering.
-

DISTRACTOR ANALYSIS

- a. Plausible but level is trending away from 57%.
 - b. **CORRECT - PZR level must be between 20 and 85% and trending toward 42 - 57%.**
 - c. Plausible but level is trending away from 42%.
 - d. Plausible but is greater than 85%.
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

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

Tier: 3 Group: RO Imp: 4.2
Applicable 10CFR55 Section: 41.10

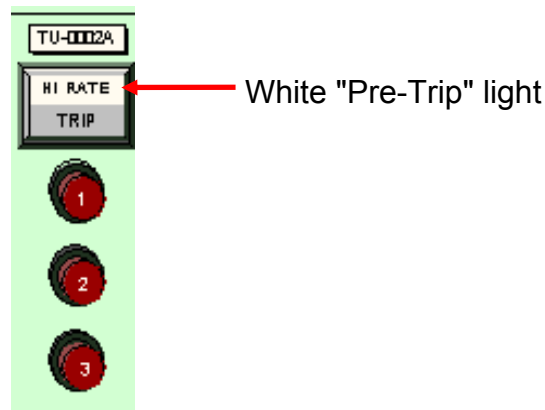
Palisades Learning Objective: RPS_CK14.0

References: ARP-21, rack 'A' window 6

Question:

Given the following with the Plant at 28% power:

- EK-0606A, "HIGH POWER RATE CHANNEL PRE-TRIP/ASI," annunciates
- The white High Power Rate pre-trip light for RPS Channel 'A' is lit (see picture below)



Which one of the following describes the cause of this condition and the action the operator will perform to verify the cause per the associated Alarm Response Procedure?

- axial Shape Index (ASI) is approaching a limit. Check the "Power Density" status on each Thermal Margin Monitor.
- axial Shape Index (ASI) is approaching a limit. Check the "Alarms" screen on each Thermal Margin Monitor.
- Startup Rate has reached the pre-trip setpoint. Verify EK-0917, "ROD WITHDRAWAL PROHIBIT," is annunciating on panel C-12.
- Startup Rate has reached the pre-trip setpoint. Verify SUR is less than 2.6 DPM on Wide Range Nuclear Instrument indication on Panel C-12.

DISTRACTOR ANALYSIS

- CORRECT**
- Plausible but the ARP specifies to check power density status.
- Plausible as this is a shared alarm but high SUR trip is disabled >15% power.
- Plausible as this is a shared alarm but high SUR trip is disabled >15% power.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1

EA2.1 - Ability to determine and interpret the following as they apply to the (Reactor Trip Recovery): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Tier: 1 Group: 1 SRO Imp: 3.7

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure to mitigate the consequences of the Loss of off site power.*

Palisades Learning Objective: TBAH_TBCORE_CK01.0

References: EOP-1.0, attachment 1; ONP-2.3, attachment 1

Question:

Given the following:

- A Reactor trip from full power has occurred due to a loss of all offsite power
- Bus 1D is de-energized due to Emergency Diesel Generator (EDG) 1-2 failing to start
- An attempt was made to manually start EDG 1-2 but was NOT successful
- Bus 1C is energized from EDG 1-1
- DC Buses D20R and D20L become de-energized

Which one of the following describes the procedure(s) that the Control Room team will transition to when EOP-1.0 actions are completed?

- a. EOP-2.0, "Reactor Trip Recovery," and ONP-2.1, "Loss of AC Power."
- b. EOP-3.0, "Station Blackout Recovery," and ONP-20, "Diesel Generator Manual Control."
- c. EOP-8.0, "Loss of Offsite Power/Forced Circulation Recovery."
- d. EOP-9.0, "Functional Recovery Procedure."

DISTRACTOR ANALYSIS

- a. Plausible because the student may believe that the reactor trip recovery procedure may be used because there is a 2400V vital bus available.
- b. Plausible if the student believes that EOP-3.0 is required if there is a loss of a 2400V vital bus.
- c. Plausible because all PCP forced flow is lost.
- d. **CORRECT - EOP-1.0 Diagnostic flow chart directs going to EOP-9.0 if D21-2 is de-energized (D20R powers D21-2).**

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW
 K/A: 000026 Loss of Component Cooling Water / 8
 G2.2.40 - Ability to apply Technical Specifications for a system

Tier: 1 Group: 1 SRO Imp: 4.7
 Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.
This exam question meets the criteria for an SRO only question because the candidate must recall specific knowledge from TS Bases 3.7.7 to correctly apply the required actions for the specific conditions given in the stem.

Palisades Learning Objective: CCW_CK22.0

References: LCO 3.7.7 (PROVIDE); TS Bases 3.7.7 page 7

Question:

Given the following with the Plant at full power:

- E-54B, Component Cooling Water (CCW) Heat Exchanger, has experienced a tube leak
- E-54B is isolated by closing the inlet and outlet isolations for both CCW and Service Water on April 1st at 0800
- All other equipment is available and OPERABLE

Assuming E-54B is NOT restored to OPERABLE status, which one of the following describes the latest allowable date and time that the plant must be in MODE 3 for this event?

- a. April 1st 1500.
- b. April 1st 1600.
- c. April 4th 0800.
- d. April 4th 1400.

DISTRACTOR ANALYSIS

- a. **CORRECT** - LCO 3.0.3 states that the plant must be in MODE 3 within 6 hours and one hour prep time is allowed.
- b. Plausible if the student correctly chooses that LCO 3.0.3 but adds an extra hour to the already 7 hours for LCO 3.0.3.
- c. Plausible if the student believes that LCO 3.7.7.A applies and does not apply the 6 hours.
- d. Plausible if the student believes that LCO 3.7.7.A applies and does apply the 6 hours.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

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

EA2.07 - Ability to determine or interpret the following as they apply to a SGTR: Plant conditions, from survey of control room indications

Tier: 1 Group: 1 SRO Imp: 4.8

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure to mitigate the consequences of the SGTR.*

Palisades Learning Objective: TBAF_TBCORE_CK01.0

References: EOP-5.0, step 17

Question:

Given the following during a Steam Generator Tube Rupture event in the 'A' Steam Generator coincident with a loss of all offsite power:

- Buses 1C and 1D are loaded from their respective Emergency Diesel Generators
- EOP-5.0, "Steam Generator Tube Rupture Recovery," is in use
- PZR Pressure is 1400 psia and unable to be lowered due to a failure of CV-2117, Pressurizer Auxiliary Spray Valve
- 'A' Steam Generator pressure is 510 psia
- All Hot Leg Narrow Range temperatures are 470°F
- Safety Injection throttling criteria are NOT met

For these conditions, which one of the following is the correct method for lowering Pressurizer pressure?

- a. Vent the Pressurizer utilizing the Pressurizer Vents per EOP Supplement 39, "Alternate Methods of Reducing PCS Pressure."
- b. Open PORV Isolation Valves per SOP-1B, "Primary Coolant System - Cooldown," and cycle one PORV to lower PZR pressure.
- c. Isolate both Steam Generators and initiate once-through cooling and transition to EOP-9.0, "Functional Recovery Procedure."
- d. Open Letdown Orifice Stop Valves and restore Letdown per EOP Supplement 27, "Restoration of Charging and Letdown."

DISTRACTOR ANALYSIS

- a. Plausible as this could lower pressure but EOP-5.0 has no direction on utilizing this supplement.
- b. **CORRECT - EOP-5.0, step 17.**
- c. Plausible as this would help lower pressure because the PORVs are used, but EOP-5.0 states that it is preferable to lose one S/G as a heat removal source to going on once through cooling.
- d. Plausible because this would lower pressure but EOP-5.0 states that SI throttling criteria must be met to perform this.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4

G2.4.30 - Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator

Tier: 1 Group: 1 SRO Imp: 4.1

Applicable 10CFR55 Section: 43.1 - Conditions and limitations in the facility license. *This exam question meets the criteria for an SRO only question because the candidate must apply knowledge contained in 10CFR50.72, "Immediate Notification Requirements for Operating Nuclear Reactors." This is a condition of the Palisades license because the license states that the facility must operate the plant within the regulations of the commission (NRC). See Palisades Renewed License No. DPR-20 section 1.D. This item also is not required knowledge for Reactor Operators.*

Palisades Learning Objective: PL-N00113_E01.05

References: EI-3, 5.2.1.b

Question:

Given the following:

- A Steam Line Break from 'B' Steam Generator occurs inside Containment coincident with a Tube Rupture in the 'A' Steam Generator
- The Shift Manager has declared a Site Area Emergency (SAE)
- Van Buren County and the State of Michigan were notified of the SAE at 0155
- Then, the Shift Manager declares a General Emergency at 0200

Which one of the following lists the latest allowable time that the State of Michigan must be notified due to the declaration of the General Emergency?

- a. 0210.
- b. 0215.
- c. 0225.
- d. 0230.

DISTRACTOR ANALYSIS

- a. Plausible if the student applies the time limit from the time that the last notification was made.
- b. **CORRECT - The state must be notified within 15 minutes of a declaration of a GE.**
- c. Plausible if the student applies the time limit from the time the last notification was made and uses 30 minutes, which is the time requirement for follow up notifications, as the limit.
- d. Plausible if the student uses 30 minutes, which is the time requirement for follow up notifications, as the limit.

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000054 (CE/E06) Loss of Main Feedwater / 4

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

Tier: 1 Group: 1 SRO Imp: 4.2

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must recall specific knowledge from LCO 3.0.4 to determine the action that will allow the plant to be placed in MODE 3.

Palisades Learning Objective: MFW_CK21.0

References: LCO 3.7.3 (PROVIDE); LCO 3.0.4.b

Question:

Given the following with the Plant at full power:

- The reactor was manually tripped due to a loss of Main Feedwater
- EOP-1.0, "Standard Post Trip Actions," are completed and then subsequently exited and the plant is stable in MODE 3
- CV-0701, Main Feedwater Regulating Valve, stuck open during the trip and was declared INOPERABLE
- As a result of CV-0701 INOPERABILITY, LCO ACTION Statement 3.7.3.A was subsequently entered and Required ACTIONS were completed
- P-8A, Auxiliary Feedwater Pump, is in service feeding both Steam Generators
- The Plant is then cooled down to MODE 5 for repairs to a CRDM seal and a heatup to MODE 3 is planned

Assuming CV-0701 is NOT repaired, which one of the following additional actions, if any, will allow the Plant to be heated up to MODE 3 per Technical Specifications?

- a. No additional actions are required because the Plant must remain in MODE 4 until CV-0701 is repaired.
- b. No additional actions are required because the Plant may be placed in MODE 3 since Auxiliary Feedwater is in service.
- c. A Safety Function Determination is performed and it is found that a loss of a safety function associated with the INOPERABILITY of CV-0701 does NOT exist.
- d. A Risk Assessment is performed and it is found that the risk associated with the INOPERABILITY of CV-0701 in MODE 3 is acceptable.

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that LCO 3.0.4 is not applicable.
- b. Plausible if the student misapplies the purpose of the LCO, i.e., for isolation of Main Feedwater and not for isolation of Containment.
- c. Plausible if candidate confuses LCO 3.0.4 requirements with LCO 3.0.6 requirements (safety function determination program.)
- d. **CORRECT - per LCO 3.0.4.b.**

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

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

G2.2.36 - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations

Tier: 1 Group: 1 SRO Imp: 4.2

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must recall knowledge of application of Technical Specifications, specifically, if 2 EDGs are inoperable LCO actions must be entered for 1 inoperable EDG and 2 inoperable EDGs. Also, the candidate must apply specific knowledge of TS Bases 3.8.1 related to operability of EDGs for inoperable sequencers.

Palisades Learning Objective: SPS_CK21.0

References: LCO 3.8.1 (PROVIDE); LCO 3.8.1 Bases; SOP-30 step 4.2.1

Question:

The Plant is in MODE 3 at normal operating temperature and pressure following a forced outage with the following conditions:

- EDG 1-1 is removed from service for a lube oil pump replacement and is due to be returned to service in 3 days
- Engineering reports to the Control Room Supervisor that the Right Channel Emergency Diesel Generator (EDG) Load Sequencer is INOPERABLE due to a power supply problem that was just discovered during an engineering analysis
- Then, a loss of the 'R' Bus occurs
- Buses 1C and 1D are being supplied from Safeguards Transformer 1-1
- Bus 1C and 1D voltage are reading 2520 VAC on Panel C-04

In addition to LCO ACTION statements 3.8.1.A, 3.8.1.B, and 3.8.1.D, which one of the following describes all other LCO 3.8.1 ACTION statements, if any, that would be entered as a result of the above plant conditions?

- a. NONE.
- b. LCO 3.8.1.E AND 3.8.1.G ONLY.
- c. LCO 3.8.1.C AND 3.8.1.G ONLY.
- d. LCO 3.8.1.C, 3.8.1.E, AND 3.8.1.G.

DISTRACTOR ANALYSIS

- a. Plausible as these are the conditions that the student would enter if they believe that an inoperable sequencer does not make the EDG inoperable.
- b. **CORRECT**
- c. Plausible as these are the conditions that the student would enter if they believe that an inoperable sequencer does not make the EDG inoperable and they believe that a voltage of 2520 VAC is outside the band of acceptability (acceptable band is 2400 - 2525) making the S/G transformer inoperable.
- d. Plausible as these are the conditions that the student would enter if they believe that a voltage of 2520 VAC is outside the band of acceptability (acceptable band is 2400 - 2525) making the S/G transformer inoperable.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades 2008 SRO NRC Exam #24

K/A: 000067 Plant Fire On-site / 8

G2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions

Tier: 1 Group: 2 SRO Imp: 4.6

Applicable 10CFR55 Section: None - This is an exception to the 10CFR55.43(b) applicability. *This exam question meets the criteria for an SRO only question because it is an SRO only duty to perform the Event Diagnostic Flow Chart in EOP-1.0. The candidate must recall specific criteria from the EOP-1.0 Event Diagnostic Flow Chart to determine that the correct answer does not restrict entry into EOP-2.0. This question is not an RO question because ROs are not required to know which EOP to transition to after EOP-1.0 is completed. (See attached SRO Task List)*

Palisades Learning Objective: TBCORE_CP04.0

References: EOP-1.0, attachment 1

Question:

Given the following:

- A Plant trip has been manually initiated in response to a fire in Emergency Diesel Generator 1-2 room
- EOP-1.0, "Standard Post Trip Actions," have been completed
- The Control Room team is determining the appropriate follow up procedure

Which one of the following items will allow entry into EOP-2.0, "Reactor Trip Recovery," in accordance with EOP-1.0, attachment 1, "Event Diagnostic Flow Chart"?

- a. Pressurizer level is 16% and stable.
- b. Containment pressure indicates 1.5 psig.
- c. PCS pressure indicates 1620 psia and stable.
- d. 2400V Bus 1D and DC Bus D21A are de-energized.

DISTRACTOR ANALYSIS

- a. Pressurizer level must be >20% to satisfy entry into EOP-2.0.
- b. Containment pressure > 0.85 psig does not satisfy entry into EOP-2.0.
- c. PCS pressure requirement is > 1650 psia and not lowering.
- d. **CORRECT**

Level of Knowledge: **LOW**

Difficulty: **3**

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000068 (BW/A06) Control Room Evac. / 8

AA2.06 - Ability to determine and interpret the following as they apply to the Control Room Evacuation: RCS pressure

Tier: 1 Group: 2 SRO Imp: 4.3

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure to mitigate the consequences of a stuck open spray valve when the Control Room is evacuated.*

Palisades Learning Objective: TBAM_CK05.0

References: ONP-25.1 Attachment 2; ONP-25.2 steps 7 and 34

Question:

Given the following with the Plant initially at full power:

- At 0815 a Reactor trip and Control Room evacuation is conducted per ONP-25.1, "Fire Which Threatens Safety-Related Equipment," and ONP-25.2, "Alternate Safe Shutdown Procedure," in response to a fire in the Cable Spreading Room
- All Immediate Actions of EOP-1.0, "Standard Post Trip Actions" and ONP-25.2 have been completed

At 0845, the operators report the following indications on C-150/C-150A, Auxiliary Hot Shutdown Panels:

- Pressurizer pressure is 1850 psia and lowering rapidly
- PCS hot leg temperatures are 530°F and lowering slowly
- PCS cold leg temperatures are 528°F and lowering slowly

Which one of the following describes a potential cause for the above conditions and the action required to maintain PCS subcooling?

- CV-2117, Auxiliary Spray Valve has failed open. Fail closed CV-2117 per ONP-25.2, "Alternate Safe Shutdown Procedure," by 0900.
- CV-2117, Auxiliary Spray Valve has failed open. Fail closed CV-2117 per EOP Supplement 37, "PZR Pressure Control Using Auxiliary Spray" by 0900.
- CV-0781 and CV-0782 Atmospheric Steam Dump Valves (ASDVs) have failed open. Fail closed CV-0781 and CV-0782 per ONP-25.2 by 0915.
- CV-0781 and CV-0782 ASDVs have failed open. Fail closed CV-0781 and CV-0782 per EOP Supplement 17, "'A' S/G ESDE Isolation Checklist" by 0915.

DISTRACTOR ANALYSIS

- CORRECT**
- Plausible but ONP-25.2 step 33 provides action, not EOP Supplement.
- Plausible but PCS temperature would lower more quickly and ONP-25.2 step 7 only allows 10 minutes for this action.
- Plausible but PCS temperature would lower more quickly and ONP-25.2 step 7 provides actions, not EOP Supplement.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4

G2.2.37 - Ability to determine operability and/or availability of safety related equipment

Tier: 1 Group: 2 SRO Imp: 4.6

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate action and procedure to determine PCS subcooling value when the PPC is unavailable which will help mitigate the consequences of the emergency.*

Palisades Learning Objective: TBAC_TBCORE_CK03.0

References: EOP-8.0 NOTE for step 13 and step 19; SOP-34 Attachment 5

Question:

Given the following with the Plant in MODE 3 at normal operating temperature and pressure:

- A loss of offsite power occurs
- The Auxiliary Operator reports that Y-220, CFMS Inverter No. 1, has malfunctioned and the output indicates "0" volts
- The Control Room team enters EOP-8.0, "Loss of Offsite Power/Forced Circulation Recovery"
- The Control Room team is in the process of verifying natural circulation flow exists in at least one PCS loop

Which one of the following procedural actions will support verification of natural circulation flow based on the above conditions?

Manually calculate ...

- a. corrected PZR Level per EOP Supplement 9, "PZR Level Correction - Hot Cal."
- b. corrected PZR Level per SOP-1B, Primary Coolant System - Cooldown."
- c. average CET temperature per EOP Supplement 2, "PCS Cooldown Strategy."
- d. average CET temperature per SOP-34, "Palisades Plant Computer System."

DISTRACTOR ANALYSIS

- a. Plausible because the PPC automatically provides a compensated PZR level reading - LPZRC and the EOP directs this step to be completed but it is NOT to support verification of natural circulation flow. The candidate also is unsure of how to apply the Hot Cal PZR level conditions.
- b. Plausible because the PPC automatically provides a compensated PZR level reading - LPZRC and the EOP directs this step to be completed but it is NOT to support verification of natural circulation flow.
- c. Plausible because EOP-8.0 directs a cooldown be performed.
- d. **CORRECT - Y-220 powers the Cutler Hammer interface with provides the average qualified CET temperature on the PPC. Natural circulation flow must be verified by determining PCS is subcooled by at least 25°F using the average of qualified CETs. With the loss of the PPC, the only method to perform this is SOP-34.**

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4

AA2.1 - Ability to determine and interpret the following as they apply to the (Natural Circulation Operations): Facility conditions and selection of appropriate procedures during abnormal and emergency operations

Tier: 1 Group: 2 SRO Imp: 3.7

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure to lower T_{AVE} which will help mitigate the consequences of the emergency.*

Palisades Learning Objective: TBAC_TBCORE_CK01.0

References: EOP-8.0, step 11

Question:

Given the following:

- A Plant trip occurs due to a loss of all offsite power
- The Control Room team implements EOP-8.0, "Loss of Offsite Power/Forced Circulation Recovery," after completion of EOP-1.0, "Standard Post Trip Actions"
- The Main Steam Isolation Valves (MSIVs) are closed
- HIC-0780A, Steam Dump Controller, is malfunctioning which is preventing the Atmospheric Steam Dump Valves (ADV) from opening
- The Reactor Operator reports that T_{AVE} is 541°F and rising

Which one of the following will the CRS direct the crew to perform FIRST to address the rising T_{AVE} ?

- a. Place P-8B, Steam Driven Auxiliary Feedwater Pump, in service per SOP-12 "Feedwater System."
- b. Open an MSIV Bypass Valve and utilize the Turbine Bypass Valve (TBV) per SOP-7, "Main Steam System."
- c. Initiate once-through PCS cooling and enter EOP-9.0, "Functional Recovery Procedure."
- d. Open MSIV Bypass Valves and place the Main Air Ejectors in service per SOP-13, "Air Ejector and Gland Seal System."

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible but condenser vacuum will not be available due to loss of offsite power.
- c. Plausible but with AFW available this is not an option.
- d. Plausible because placing the Hogger Air Ejector is an acceptable action for this condition, but not the Main Air Ejectors.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 006 Emergency Core Cooling

A2.02 - 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: Loss of flow path

Tier: 2 Group: 1 SRO Imp: 4.3

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must apply knowledge that describes what is required for an ECCS train to be operable to determine if the LCO is met and the action that will allow exiting the applicable action statement.

Palisades Learning Objective: SIS_CK22.0

References: LCO 3.5.2, QO-5, attachment 30 note

Question:

The Plant is in MODE 3 with the following conditions:

- PCS temperature is 350°F
- Pressurizer pressure is 500 psia
- A Plant heatup per GOP-2, "MODE 5 to MODE 3 \geq 525°F," is in progress
- CV-3059, HPSI Pump P-66B to HPSI Train 1, spuriously goes from the open position to the closed position and is declared INOPERABLE

Which one of the following describes whether LCO 3.5.2, "ECCS - Operating," is currently met and the action, if any, that will allow any applicable LCO ACTION statement to be exited?

- a. LCO 3.5.2 is NOT met.
Cooling down the Plant to $<325^{\circ}\text{F}$ will allow all ACTION statements to be exited.
- b. LCO 3.5.2 is NOT met.
Opening CV-3018, HPSI Pump P-66B to HPSI Train 2, will allow all ACTION statements to be exited.
- c. LCO 3.5.2 is NOT met.
Opening CV-3037, HPSI Pump P-66A to HPSI Train 1, will allow all ACTION statements to be exited.
- d. LCO 3.5.2 is met.
No ACTION statements are required to be entered.

DISTRACTOR ANALYSIS

- a. **CORRECT** - This places the plant in a condition in which LCO 3.5.2 does not apply which allows exiting action statement 3.5.2.B.
- b. Student believes that allowing P-66B another flowpath to HPSI train 2 will allow the action statement to be exited.
- c. Student believes that directing P-66A flow to HPSI Train 1 will allow the action statement to be exited.
- d. Student believes that LCO is still met since either HPSI pump can discharge to either train allowing redundancy.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 010 Pressurizer Pressure Control

G2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation

Tier: 2 Group: 1 SRO Imp: 4.7

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure to control Pressurizer pressure with both pressure controllers malfunctioning.*

Palisades Learning Objective: IOTF_CK03.0

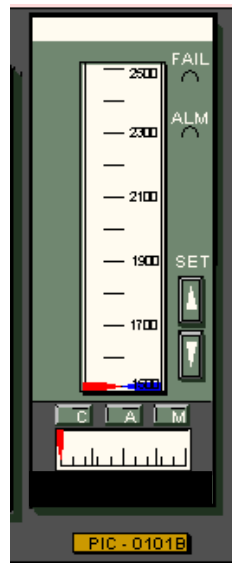
References: ONP-18, 4.2.1.b; ARP-4, window 54

NOTE: The question change identified below with the ~~strikeout~~ and **BOLD underline** were made as a result of an applicant comment during the administration of the written examination.

Question:

Given the following during a plant heatup in MODE 3 following a refueling outage:

- The PCS is at normal operating pressure with T_{AVE} at 500°F
- PIC-0101A, 'A' Pressurizer Pressure Controller, is out of service due to a controller failure
- EK-0754, "PRESSURIZER PRESSURE OFF NORMAL HI-LO," annunciates
- The Reactor Operator observes the following for ~~PIC-0101B~~ **PIC-0101B**, 'B' Pressurizer Pressure Controller:



Which one of the following procedures will the Control Room Supervisor use to control Pressurizer pressure?

- ONP-24.4, "Loss of Preferred AC Bus Y40."
- ONP-18, "Pressurizer Pressure Control Malfunctions."
- SOP-1A, "Primary Coolant System."
- SOP-1C, "Primary Coolant System - Heatup."

DISTRACTOR ANALYSIS

- Plausible if the student believes that the affected controller is powered from Y40 - actually powered from Y20.
- CORRECT**
- Plausible because this procedure will direct the operator to supplement that provides direction to use Auxiliary Spray, however, main spray is not lost.
- Plausible because this is the in use procedure but there is no direction for this condition.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 064 Emergency Diesel Generator

G2.2.23 - Ability to track Technical Specification limiting conditions for operations

Tier: 2 Group: 1 SRO Imp: 4.6

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from the requirements associated with discovery time per LCO bases 3.0.2.

Palisades Learning Objective: EDG_CK21.0

References: LCO 3.8.1 (PROVIDE); LCO bases 3.0.2, discovery time

Question:

Given the following with the Plant at full power:

- Emergency Diesel Generator (EDG) 1-1 was declared INOPERABLE at 0800 due to a faulty voltage regulator
- EDG 1-2 is then declared INOPERABLE as a result of a common cause analysis per LCO ACTION statement 3.8.1.B.3.1 which was completed at 1200
- All other power sources remain OPERABLE

Assuming neither EDG is restored to OPERABLE status, which one of the following is the latest allowable time in which the plant must be placed in MODE 3?

- a. 1600
- b. 1700
- c. 2000
- d. 2100

DISTRACTOR ANALYSIS

- a. Plausible if the student applies the start time for LCO 3.8.1.E at 0800.
- b. Plausible if the student applies the start time for LCO 3.8.1.E at 0800 and applies the 1 extra hour allowed in LCO 3.0.3.
- c. **CORRECT - 2 hour LCO action statement plus 6 hours to be in MODE 3 from 1200 - 2000.**
- d. Plausible if the student correctly applies the start time for LCO 3.8.1.E at 1200 but applies the 1 extra hour allowed in LCO 3.0.3.

Level of Knowledge: HIGH

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 073 Process Radiation Monitoring

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

Tier: 2 Group: 1 SRO Imp: 3.2

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from TS bases 3.7.10 that describes the operability requirements for a CRV Filtration train.

43.4 - Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. *This exam question also meets the criteria for an SRO only question because the candidate must analyze and interpret the effects of a loss of radiation monitoring capability for the control room and select the appropriate procedural action to mitigate those effects.*

Palisades Learning Objective: CRHV_CK22.0

References: ARP-33, window 39; LCO 3.7.10 bases page 3; SOP-24, section 4.3.5.b

Question:

Given the following conditions:

- The Plant is at full power
- 'A' Train of Control Room HVAC (CRHVAC) is in service in Normal Mode
- EK-0239, "CR HVAC TRAIN A RIA-1818A HI RAD/FAIL," annunciates
- Investigation into this alarm determines that RIA-1818A, Control Room Continuous Air Monitor for 'A' Train of CRHVAC, has failed and CANNOT be immediately repaired

Based on the above conditions, which one of the following describes whether LCO 3.7.10, "CRV Filtration," is met and the action, if any, that will be taken?

- a. LCO 3.7.10 is NOT met.
Immediately transfer to 'B' CRHVAC Train in NORMAL Mode per SOP-24, "Ventilation and Air Conditioning System."
- b. LCO 3.7.10 is NOT met.
Immediately place 'A' CRHVAC Train in EMERGENCY Mode per SOP-24, "Ventilation and Air Conditioning System."
- c. LCO 3.7.10 is met.
Immediately transfer to 'B' CRHVAC Train in NORMAL Mode per SOP-24, "Ventilation and Air Conditioning System."
- d. LCO 3.7.10 is met.
No actions are required.

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that a malfunctioning RIA causes CRHVAC filtration train to be inoperable. This action would also be correct.
- b. Plausible if the student believes that a malfunctioning RIA causes CRHVAC filtration train to be inoperable. This action would also be correct
- c. **CORRECT - LCO 3.7.10 is met and SOP-24 requires placing 'B' train in service or shifting 'A' train to emergency.**
- d. Plausible if the student correctly believes that a loss of the RIA does not render the CRHVAC train inoperable, but does not know that any action is required.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 076 Service Water

G2.2.44 - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Tier: 2 Group: 1 SRO Imp: 4.4

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from TS Bases 3.7.8 that defines what is required to satisfy 100% post accident cooling capability for the given conditions.

Palisades Learning Objective: SWS_CK22.0

References: LCO 3.7.8 Bases, page 3

Question:

Given the following with the Plant initially at full power:

- A Plant trip occurs due to a large break Loss of Coolant Accident
- 2400V Bus 1D de-energizes and locks out due to an overcurrent fault
- Safety Injection and Containment Spray initiate as designed

Which one of the following operator actions will ensure that one hundred percent (100%) of the Technical Specification required Service Water System post accident cooling capability will be provided to mitigate this event?

- a. Close CV-1359, Non-critical SW Header Isolation.
- b. Close CV-0824, SW Containment Isolation Valve.
- c. Start an additional Service Water Pump.
- d. Close two Containment Air Cooler high capacity valves.

DISTRACTOR ANALYSIS

- a. Plausible as this would raise pressure but CV-1359 already closed by SIAS.
- b. **CORRECT per LCO 3.7.8 Bases, if only one SW pump is available post accident, non-critical loads and containment loads must be isolated.**
- c. Plausible as this would raise pressure but P-7B is the only SW Pump available and is already running via SIAS.
- d. Plausible as this would be an EOP-1.0 action to raise pressure > 42 psig but closure of CAC high cap valves does not satisfy LCO 3.7.8 requirements.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 011 Pressurizer Level Control

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

Tier: 2 Group: 2 SRO Imp: 3.9

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure to mitigate the consequences of a failed PZR level controller due to a high T_{AVE} signal.*

Palisades Learning Objective: PLCS_CK11.0

References: SOP-1A Attachment 10; ARP-4 window 61; ONP-13, step 4.1

Question:

The plant is in MODE 3 at normal operating pressure and temperature with the following conditions:

- LIC-0101B, 'B' Channel Pressurizer Level Controller, is in service in CASCADE
- P-55A, Charging Pump, is operating with P-55B and P-55C secured in Automatic
- CV-2003, Letdown Orifice Stop Valve, is in Automatic and open with all other Letdown Orifice Stop Valves in Automatic and closed
- SS-TAVE, Avg Temperature Display Selector Switch, on panel C-02 is in the LOOP 2 position

Then, the following occurs:

- EK-0761, "PRESSURIZER LEVEL HI-LO," annunciates
- EK-0967, "LOOP 1/LOOP 2 T_{AVE} DEVIATION," annunciates
- EK-0969, "LOOP 2 T_{AVE}/T_{REF} GROSS DEVIATION," annunciates
- The setpoint meter (blue pointer) on LIC-0101B indicates 57%
- The process meter (red pointer) on LIC-0101B indicates 42%
- TI-0110, T_{AVE} Digital Temperature Indicator, on Panel C-02 indicates 572°F

Which one of the following describes the impact on the Pressurizer Level Control System and the procedure that the Control Room team will use for the above conditions?

- a. Charging Pump P-55A goes to minimum speed.
SOP-2A, "Chemical and Volume Control System."
- b. Charging Pumps P-55B and P-55C start.
ONP-13, " T_{AVE}/T_{REF} Controller Failure."
- c. Charging Pumps P-55B and P-55C start.
SOP-2A, "Chemical and Volume Control System."
- d. Charging Pump P-55A goes to minimum speed.
ONP-13, " T_{AVE}/T_{REF} Controller Failure."

DISTRACTOR ANALYSIS

- a. Plausible if the student misapplies the calculated setpoint compared to control of the B/U PZR level control system and the student believes the correct procedure is SOP-2A.
- b. **CORRECT**
- c. Plausible if the student believes the correct procedure is SOP-2A.
- d. Plausible if the student misapplies the calculated setpoint compared to control of the B/U PZR level control system.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 015 Nuclear Instrumentation

A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Power supply loss or erratic operation

Tier: 2 Group: 2 SRO Imp: 3.9

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases. *This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from TS Bases 3.3.9 that defines what constitutes a channel of neutron monitoring in the given MODE or other specified condition in the applicability. The candidate must also apply knowledge from TS Bases 3.3.1 that defines which WR NI indication (i.e., plasma display) is qualified as post accident instrumentation.*

Palisades Learning Objective: NI_CK22.0

References: LCO 3.3.7 (PROVIDE); LCO 3.3.1 Bases Table B 3.3.1-1; LCO 3.3.9 (PROVIDE); LCO 3.3.9 Bases page 2

Question:

Given the following plant conditions:

- The plant is in MODE 3 at normal operating pressure and temperature
- The Primary Coolant System (PCS) is being diluted in preparation for critical approach two shifts from now
- The Wide Range flux level plasma indication for Source/Wide Range NI-1/3 on Panel C-06 begins to act erratically and is determined to be unreliable
- The NI-1/3 analog count rates on Panel C-02 are indicating normal
- NI-1/3 indications on Panel C-02 channel check to NI-2/4 indications

Given these conditions, which one of the following identifies if LCO 3.3.9, Neutron Flux Monitoring Channels, and LCO 3.3.7, Post Accident Monitoring Instrumentation, are satisfied and identifies the minimum ACTIONS, if any, that are required?

- a. LCO 3.3.9 is met, LCO 3.3.7 is met.
No ACTIONS are required.
- b. LCO 3.3.9 is NOT met, LCO 3.3.7 is met.
Immediately stop dilution of the PCS and perform a SDM verification within 4 hours.
- c. LCO 3.3.9 is met, LCO 3.3.7 is NOT met.
Restore NI-1/3 plasma indication to OPERABLE status within 30 days.
- d. LCO 3.3.9 is met, LCO 3.3.7 is NOT met.
Restore NI-1/3 plasma indication to OPERABLE status within 7 days.

DISTRACTOR ANALYSIS

- a. Plausible if the student believes that plasma indication is not a PAM instrument.
- b. Plausible if the student believes that a channel of NMS is lost.
- c. **CORRECT**
- d. Plausible if the student believes that LCO action 3.3.7.C applies.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: 016 Non-nuclear Instrumentation

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

Tier: 2 Group: 2 SRO Imp: 4.0

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from TS Bases 3.7.6 that describes the how to satisfy the required action from the LCO.

Palisades Learning Objective: AFW_CK22.0

References: TS 3.7.6 Bases page 3

Question:

Given the following plant conditions:

- The Plant is at full power
- EK-1108, "CONDENSATE STORAGE TANK T-2 HI-LO LEVEL," annunciates due to LIA-2021, T-2 Level Indicating Alarm, reading 64% on Panel C-13
- LCO ACTION Statement 3.7.6.A, "Condensate volume not within limit" has been entered due to the low level in T-2
- Performance of Required ACTION 3.7.6.A.1 is in progress

Required ACTION 3.7.6.A.1 states the following:

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Condensate volume not within limit.	A.1 Verify OPERABILITY of backup water supplies.	4 hours <u>AND</u> Once per 12 hours thereafter

Which one of the following will satisfy Required ACTION 3.7.6.A.1?

Verify that ...

- T-81, Primary Makeup Storage Tank, level is greater than 81%.
- Service Water and Fire Water are available to supply AFW Pumps.
- T-939, Demineralized Water Storage Tank, level is greater than 70%.
- P-936, Demineralized Water Transfer Pump, is available to supply T-2.

DISTRACTOR ANALYSIS

- Plausible because SOP-12 states that this tank must be maintained above this level but once the LCO is entered this is not the appropriate required action.
- CORRECT**
- Plausible because SOP-12 contains direction on how to supply T-2 and T-81 from T-939.
- Plausible because P-936 supplies T-2 and there is direction is SOP-12 on how to manually fill T-2 from T-939.

Level of Knowledge: LOW

Difficulty: 4

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.1.37 - Knowledge of procedures, guidelines, or limitations associated with reactivity management

Tier: 3 Group: SRO Imp: 4.6

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases. *This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from TS Bases 3.9.2 that describes the requirements to meet LCO 3.9.2 for monitoring Source Range counts while refueling is in progress, i.e., 1 visual indication from each channel and 1 audible indication.*

Palisades Learning Objective: NI_CK22.0

References: LCO 3.9.2 Bases

Question:

Given the following:

- The Plant is in MODE 6
- All conditions necessary to move fuel are met
- Refueling operations are in progress in the Containment Building and Spent Fuel Pool

Which one of the following conditions requires entering an ACTION Statement for LCO 3.9.2, "Refueling Operations - Nuclear Instrumentation"? Consider each condition separately

- a. The Speaker Switch for the Control Room on the Audible Count Rate Drawer at panel C-27 is placed in 'OFF'.
- b. NI-1/3 Source Range Counts Plasma Display on Panel C-06 is malfunctioning.
- c. NI-2/4 Source Range Counts Remote Power Meter on C-02 fails low.
- d. NI-REC1/SS, Source Range/Wide Range Recorder Selector Switch, on panel C-12 is placed in 'WIDE RANGE'.

DISTRACTOR ANALYSIS

- a. **CORRECT - TS Bases 3.9.2 states that the Control Room must have at least one visual indication from each channel and 1 audible indication from one channel for the Source Range to be considered operable.**
- b. Plausible because this is an indication, however, there is still indication from this channel on C-02.
- c. Plausible because this is an indication, however, there is still indication from this channel on C-06.
- d. Plausible if the student believes the switch also powers the indications on panel C-02/C-06.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.1.42 - Knowledge of new and spent fuel movement procedures

Tier: 3 Group: SRO Imp: 3.4

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases. *This exam question meets the criteria for an SRO only question because the candidate must apply knowledge (i.e., the required ventilation alignment) of how to meet LCO 3.7.12 when fuel assemblies that have decayed < 30 days are moved in the Spent Fuel Pool.*

43.7 - Fuel Handling Facilities and Procedures. *This exam question also meets the criteria for an SRO only question because the candidate must apply knowledge from the Refueling Operations and Fuel Handling procedure to determine the ventilation lineup that will allow fuel to be moved in the SFP that has decayed < 30 days.*

Palisades Learning Objective: IOTD_E01.02

References: GOP-11 section 5.7.1

Question:

Given the following plant conditions:

- The Plant was shutdown 15 days ago for a refueling outage
- Movement of irradiated fuel assemblies removed from the core during the outage is planned in the Spent Fuel Pool
- HS-1894, Fuel Handling Area Exhaust Damper Control Switch, is in the REFUEL position

Which one of the following Fuel Handling Area Ventilation System alignments will MEET the required conditions for performing the above fuel moves?

	V-7 Supply Fan	V-8A Exhaust Fan	V-8B Exhaust Fan
a.	ON	ON	ON
b.	OFF	ON	ON
c.	OFF	ON	OFF
d.	ON	OFF	ON

DISTRACTOR ANALYSIS

- Plausible if the student believes that since this moves the most amount of air through the Charcoal filter, that this is the correct lineup but with fuel decayed less than 30 days it is not allowed.
- Plausible if the student believes that this lineup will result in the lowest pressure in the Fuel Handling Building.
- CORRECT - With fuel decayed less than 30 days, only 1 V-8 can be ON and V-7 must be OFF.**
- Plausible if the student correctly believes that only one fan should be off, but also believes that fresh air needs to be supplied to the Fuel Handling Building.

Level of Knowledge: HIGH

Difficulty: 2

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.2.17 - Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator

Tier: 3 Group: SRO Imp: 3.8

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem, i.e., Plant MODE, and use those conditions to select the appropriate procedure for performing a risk assessment. Plant MODE is required in the stem because the risk assessment procedure changes if the Plant is below MODE 3.*

This exam question also meets the criteria for an SRO only question because performing a risk assessment is an SRO only task. (see attached SRO task list)

Palisades Learning Objective: ADAO_E02.02

References: ADMIN 4.02, attachment 3

Question:

Given the following plant conditions:

- The Plant is in MODE 1
- P-66B, HPSI Pump, is out of service
- A severe thunderstorm warning is in effect
- Irradiated fuel moves are in progress in the Spent Fuel Pool

In addition to EN-WM-104, "On-Line Risk Assessment," which one of the following procedures would be used for performing a risk assessment for the above plant conditions?

- a. Admin 4.02, "Control of Equipment."
- b. Admin 4.11, "Safety Function Determination Program."
- c. EN-OP-115, "Conduct of Operations."
- d. GOP-11, "Refueling Operations and Fuel Handling."

DISTRACTOR ANALYSIS

- a. **CORRECT**
- b. Plausible since this procedure addresses safety functions.
- c. Plausible as this procedure addresses various administrative requirements but not risk assessments.
- d. Plausible since this procedure would be in-use and GOP-14 is used in MODES 4, 5, 6. The student misapplies this.

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: G2.2.25 - Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits

Tier: 3 Group: SRO Imp: 4.2

Applicable 10CFR55 Section: 43.2 - Facility operating limitations in the technical specifications and their bases.

This exam question meets the criteria for an SRO only question because the candidate must apply knowledge from TS Bases 3.8.1 which describes the power sources that are considered qualified to meet the requirements of LCO 3.8.1 and the reasons.

Palisades Learning Objective: SPS_CK22.0

References: TS Bases for LCO 3.8.1 page 5

Question:

Which one of the following explains why Station Power Transformer 1-2 is NOT considered an acceptable offsite AC power source in MODES 1-4 to meet Technical Specifications?

- a. Station Power Transformer 1-2 is not equipped with a Load Tap Changer (LTC).
 - b. Accident loading during a DBA would exceed the capacity of Station Power 1-2 Transformer.
 - c. Station Power Transformer 1-2 is not independent from other qualified offsite sources.
 - d. The bus alignments required to energize Buses 1C and 1D from Station Power Transformer 1-2 are time consuming.
-
-

DISTRACTOR ANALYSIS

- a. Plausible because S/U and S/G Transformers have load tap changers.
 - b. Plausible because more loads are in service during an accident.
 - c. **CORRECT**
 - d. Plausible because there is a fast transfer available from S/G to S/U.
-
-

Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.3.14 - Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities

Tier: 3 Group: SRO Imp: 3.8

Applicable 10CFR55 Section: 43.4 - Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. *This exam question meets the criteria for an SRO only question because the candidate must analyze radiation conditions in the Containment Building and apply knowledge of the requirements for entry. This is also an SRO only duty to authorize Containment entries (see attached SRO task list)*

Palisades Learning Objective: APWC_T03.00

References: HP-2.6, step 4.1.1

Question:

With the Plant operating in MODE 1, two maintenance technicians contact the Control Room and request permission to enter the Containment to perform a calibration of an instrument located in the 590' Air Room.

Which one of the following conditions would require the Control Room to NOT allow these technicians to enter the Containment?

- a. Reactor Power will be changed by 2% during the entry.
 - b. Expected Containment neutron dose rate is 150 mR/Hr.
 - c. RIA-1805, Containment Area Monitor, indicates 5×10^{-1} R/Hr.
 - d. RIA-1817, Containment Air Monitor, is declared INOPERABLE.
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DISTRACTOR ANALYSIS

- a. **CORRECT - If power is changed by > 1.5% entry is not allowed.**
 - b. Plausible because the procedure specifies controls for high neutron dose rate, but these must exceed 1R/hour corrected.
 - c. Plausible because an entry with high rates on Containment rad monitors (>1 R/Hr) requires Rad Manager permission.
 - d. Plausible because the air monitor reading should be within 50% of the reading taken from the previous entry, but other controls are taken to meet this requirement.
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Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: NEW

K/A: G2.4.16 - Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines

Tier: 3 Group: SRO Imp: 4.4

Applicable 10CFR55 Section: 43.5 - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. *This exam question meets the criteria for an SRO only question because the candidate must assess the facility conditions given in the stem and use those conditions to select the appropriate procedure for restoring PZR heaters.*

Palisades Learning Objective: TBAF_TBCORE_CP02.0

References: EOP-5.0, step 42

Question:

Given the following:

- The Plant is at full power
- Emergency Diesel Generator 1-2 out of service

Then, the following occurs:

- The plant is manually tripped due to indications of a Steam Generator Tube Rupture
- EOP-1.0, "Standard Post Trip Actions," are complete and EOP-5.0, "Steam Generator Tube Rupture Recovery," is currently in-use
- Safety Injection then initiates per design with the exception that Bus 1D de-energizes due to a ground/overcurrent fault
- Pressurizer level is currently 45% and slowly lowering

Which one of the following procedures provides the most expeditious method of restoring available Pressurizer Heater capability for the above plant conditions?

- a. ONP-2.1, "Loss of AC Power."
- b. EOP Supplement 28, "Supplementary Actions for Loss of Power."
- c. SOP-30, "Station Power."
- d. ONP-18, "Pressurizer Pressure Control Malfunctions."

DISTRACTOR ANALYSIS

- a. Plausible because ONP-2.1 contains directions for transfer heater power from Bus 1E to Bus 1C but this could take up to 5 hours.
- b. Plausible because this procedure directs DG 1-3 be started but this DG can only supply 1C or 1D bus.
- c. **CORRECT - SOP-30 contains a section for restoring Bus 1E following an SIAS. EOP-5.0 directs the use of this.**
- d. Plausible because this procedure restores PZR Heaters from Bus 1D.

Level of Knowledge: HIGH

Difficulty: 3

WRITTEN QUESTION DATA SHEET

Source of Question: BANK - Palisades

K/A: G2.4.38 - Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required

Tier: 3 Group: SRO Imp: 4.4

Applicable 10CFR55 Section: None - This is an exception to the 10CFR55.43(b) applicability. *This exam question meets the criteria for an SRO only question because it is an SRO only duty to determine protective action recommendations for off-site populations during implementation of the emergency plan. (see attached SRO task list)*

Palisades Learning Objective: PL-N00112

References: EI-6.13, section 5.0

Question:

While developing a Protective Action Recommendation to the State of Michigan during a LOCA in accordance with EI-6.13, "Protective Action Recommendations for Offsite Populations," each of the following indicates severe reactor core damage exists EXCEPT:

- a. Very high core temperatures exist.
 - b. All Engineered Safeguards Pumps are lost.
 - c. Very high stack gas radiation monitor readings exist.
 - d. Six of eight red lights LIT on the Reactor Vessel Level Monitoring System.
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DISTRACTOR ANALYSIS

- a. Plausible - meets the criteria.
 - b. Plausible - meets the criteria.
 - c. Plausible - meets the criteria.
 - d. **CORRECT - Level is low but above fuel.**
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Level of Knowledge: LOW

Difficulty: 3

WRITTEN QUESTION DATA SHEETPALISADES June 2009 NRC ILT Written Examination Answer Key

- Questions 1 through 75 are RO level questions.
- Questions 76 through 100 are SRO level questions.

<u>Q#</u>	<u>Answer</u>	<u>Q#</u>	<u>Answer</u>	<u>Q#</u>	<u>Answer</u>	<u>Q#</u>	<u>Answer</u>
1	D	26	B	51	C	76	D
2	C	27	A	52	A	77	A
3	C	28	C	53	D	78	B
4	B	29	C	54	B	79	B
5	B	30	D	55	C	80	D
6	B	31	C	56	D	81	B
7	D	32	A	57	C	82	D
8	C	33	A	58	B	83	A
9	A	34	B	59	B	84	D
10	D	35	C	60	D	85	A
11	C	36	D	61	D	86	A
12	C	37	A	62	D	87	B
13	B	38	A	63	A	88	C
14	B	39	A	64	D	89	C
15	B	40	B	65	C	90	B
16	D	41	B	66	C	91	B
17	B	42	A	67	C	92	C
18	B	43	B	68	C	93	B
19	A	44	A	69	A	94	A
20	A	45	C	70	D	95	C
21	D	46	D	71	C	96	A
22	B	47	C	72	D	97	C
23	D	48	A	73	C	98	A
24	A	49	A	74	B	99	C
25	A	50	D	75	A	100	D

WRITTEN QUESTION DATA SHEET

PALISADES 2009 WRITTEN EXAMINATION LIST OF REFERENCE HANDOUTS PROVIDED

Related Question #	REFERENCE HANDOUTS PROVIDED	REVISION NUMBER
2,11,27	Steam Tables	N/A
58	Palisades Technical Data Book, Figure 1.9, "Power Dependent Insertion Limits"	Revision 3
67	SOP-12, Attachment 16, Figure 16-1, "Maximum Heat Balance Power for AFW Initiation"	Revision 53
<u>NOTE:</u> The following reference handouts are for the SRO-only examination.		
77	Technical Specification 3.7.7, "Component Cooling Water (CCW) System"	Amendment 199
80	Technical Specification 3.7.3, "Main Feedwater Regulating Valves (MFRVs) and MFRV Bypass Valves"	Amendment 189
81,88	Technical Specification 3.8.1, "AC Sources - Operating"	Amendment 189
92	Technical Specification 3.3.7, "Post Accident Monitoring (PAM) Instrumentation"	Amendment 221
	Technical Specification 3.3.9, "Neutron Flux Monitoring Channels"	Amendment 189