WRITTEN QUESTION DATA SHEET

Question Number: 1

K/A: 000005 Inoperable/Stuck Control Rod / 1 K3.03
Knowledge of the reasons for the following responses as they apply to the Inoperable/Stuck Control Rod: Tech-Spec limits for rod mismatch.

Tier: 1 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5, 41.10 / 45.6 / 45.13

Palisades Training Objective: Describe the consequences of operating the Control Rod Drive System under the following conditions: (CRD_CK16.0)
Not aligning Control Rods within a group when misaligned greater than or equal to two inches from any two Control Rods in the same group.

References: SOP-6, 4.1.8, rev 20; TS 3.1.4. Basis; ONP-5.1, rev 20;

Question:
During a planned power reduction from full power Group 4 rod positions are indicating as follows:

- Rod 41 - 122.0"
- Rod 40 - 123.3"
- Rod 39 - 112.2"
- Rod 38 - 114.1"

What adverse consequences are of concern with these rod positions?

a. Rod 41 and 40 CRDM motors will overheat due to continuous drivedown.

b. Power peaking limits may have been exceeded.

c. Excessive negative reactivity has been inserted into the core.

d. Uncontrollable Xenon oscillations will be induced.

DISTRACTOR ANALYSIS

a. Rod drivedown is a valid feature of the rod drive system, but would not apply here. Candidate incorrectly believes this occurs due to rod 40 and 41 auto aligning with rest of group.
b. **CORRECT - rods not aligned with remainder of group create power peaking concerns.**
c. Candidate incorrectly believes rods have been inserted too far.
d. Xenon oscillations are a concern for certain conditions.

Cognitive Level: HIGH 2
Recognize consequences or implications. Candidate must recognize the implications of a given plant condition (rod positions.)

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 2

K/A: 000015/17 RCP Malfunctions / 4 K2.10
Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and RCP indicators and controls.

Tier: 1 **RO Imp:** 2.8 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** 2.8 **SRO Exam:** Yes` **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Describe the consequences of operating the Primary Coolant Pumps under the following conditions: PCP motor abnormal parameters (PCP_CK16.0)

References: ARP-5, window 1, rev 65 FSAR 14.7.2.1

Question:
The plant is at 100% power and operating normally when the following occurs:

- P-50A Primary Coolant Pump (PCP) ammeter pegs HIGH and then drops to 0 amps and remains at 0.
- The reactor automatically trips approximately 1-2 seconds later.
- PCPs P-50B, C, D remain operating normally.

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

a. P-50A has a seized pump shaft and the reactor tripped due to low Primary Coolant flow.

b. P-50A has a sheared pump shaft and the reactor tripped due to low Primary Coolant flow.

c. The feeder breaker to Bus 1A tripped due to a fault which caused a Main Generator protective relay actuation and a reactor trip.

d. P-50A was cavitating which caused at least 2 out of 4 TM/LP channels to actuate an automatic reactor trip.

DISTRACTOR ANALYSIS

a. **CORRECT - No counter emf results in much higher amps than normal. Breaker trips on overcurrent, resulting in 0 amps (i.e., breaker has tripped, pump is not running.)**
b. Candidate may believe that 0 amps is indicative of less pump work.
c. Candidate may believe a protective relay actuated, but the feeder breaker to Bus 1A could NOT have tripped, since the other PCP powered from Bus 1A is still running.
d. Cavitation does exhibit erratic flow and amps, but does NOT match with amps pegging high.

Cognitive Level: HIGH 2
Recognize consequences or implications. Candidate is provided a set of conditions to analyze (level 3) and required to describe the implications of these conditions (i.e., what is wrong, and what caused the reactor to trip - level 2).

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:3

K/A: BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4 A1.02
Ability to operate and/or monitor operating behavior characteristics of the facility as they apply to the (Natural Circulation Operations).

Tier: 1 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** **2**

Group: 1 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: Given a set of accident data, evaluate parameters to determine if natural circulation is occurring IAW the in-use EOP. (TBAC_E02.04)

References: LP-RHAA EOP-8.0 Basis, page 48, rev 10

Question:
The plant was at 50% power when the power supplies for all Primary Coolant Pumps became deenergized.

Which one of the following describes an operating behavior characteristic of the Primary Coolant System (PCS) that is present during natural circulation?

a. Loop ΔT LESS than normal full power ΔT due to the reduced core power level.

b. Loop ΔT GREATER than normal full power ΔT since a higher thermal driving head is required.

c. Rate of steam generator pressure reduction is LESS than rate of PCS temperature reduction due to HIGHER thermal driving head.

d. Rate of steam generator pressure reduction is LESS than rate of PCS temperature reduction due to the REDUCED thermal driving head.

DISTRACTOR ANALYSIS

a. **CORRECT - Per given reference.**
b. Candidate may believe a higher thermal driving head is required, and mistakenly believes that loop delta T is greater.
c. Rate of steam generator pressure reduction is related, but not as listed.
d. Rate of steam generator pressure reduction is related, but not as listed.

Cognitive Level: HIGH 2
Rephrasing of information in different words; describing relationships. Candidate is required to describe natural circulation in a different context (i.e., in the context of the relationship between loop deltaT at full power as compared to during natural circulation.)

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 4

K/A: 000024 Emergency Boration / 1 K2.01
Knowledge of the interrelations between the Emergency Boration and valves.

Tier: 1 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** **2**

Group: 1 **SRO Imp:** 2.7 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given a directive, initiate and terminate Emergency Boration in accordance with SOP-2A. (CVCS_T01.00)

References: DBD 1.04, page 49 SOP-2A, 7.5.2.b and Attachment 6, 2.2.3, rev 52

Question:
The crew is initiating Emergency Manual Boration per EOP 1.0, "Standard Post Trip Actions" following a reactor trip with 2 full length control rods not fully inserted.

- Bus 1C and Bus 1D are both energized.
- One HPSI pump running.
- Boric Acid Pump P-56A is running.
- Charging Pump P-55A is operating.

Which of the following emergency boration methods should be selected if VCT outlet valve (MO-2087) is open and will NOT close from the Main Control Board?

a. Open MO-2169 and MO-2170, Gravity Feed Valves.

b. Open MO-2160, SIRWT to Charging Pump Suction.

c. Open MO-2140, Pumped Feed Valve.

d. Open MO-3072, CVCS to HPSI Train 2.

DISTRACTOR ANALYSIS

a. These are valves associated with the evolution, but incorrectly used.
b. This is a valve associated with the evolution, but incorrectly used.
c. **CORRECT - The fact that MO-2087 closes on an SIAS illustrates that it is important to ensure boric acid is provided to suction of the charging pumps, unimpeded by head/pressure interference from VCT. Operating pumped feed method precludes these concerns.**
d. This is a valve associated with the CVCS system, but incorrectly used.

Cognitive Level: HIGH 2
Recognizing relationships, implications. Candidate must apply knowledge of the Chemical and Volume Control System to determine how an unusual condition impacts the operation of system valves.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 5

K/A: 000026 Loss of Component Cooling Water / 8 K3.02
Knowledge of the reasons for the automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS as they apply to the Loss of Component Cooling Water.

Tier: 1 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5, 41.10 / 45.6 / 45.13

Palisades Training Objective: Given Plant conditions involving a Containment High Pressure Signal, describe the effect on the Component Cooling Water System in accordance with Component Cooling Water Design Basis Document. (CCW_CK26.0)

References: DBD 1.01, 3.2.1

Question:
Which one of the following Engineered Safeguards Features will result in a loss of Component Cooling Water (CCW) to the Primary Coolant Pumps (PCPs), and what is the reason for the alignment?

a. Containment High Pressure (CHP) - ensures containment building performs its design function.

b. Containment High Radiation (CHR) - reduces radiation release potential by isolating CCW headers.

c. Safety Injection Signal (SIS) on Low Pressurizer Pressure - Since operators will be manually tripping PCPs for Low Pressurizer Pressure events, this provides more cooling for SIS actuated components.

d. Recirculation Actuation Signal (RAS) - ensures adequate cooling capability for the hotter containment sump water following a Large Break LOCA, by isolating CCW to the PCPs.

DISTRACTOR ANALYSIS

a. **CORRECT - CCW containment valves isolate on CHP to ensure containment isolation.**
b. CHR does cause containment isolation, but NOT of CCW valves.
c. SIS does isolate certain portions of CCW, but not as listed.
d. RAS does actuate certain valves, but not CCW valves to containment.

Cognitive Level: HIGH 2
Recognizing relationships; how systems interact; implications. Candidate must demonstrate comprehension of the how an ESFAS actuation can cause a loss of component cooling water, and what is the reason for the effect.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 6

K/A: 000027 Pressurizer Pressure Control System Malfunction / 3 K1.01
Knowledge of the operational implications of the definition of saturation temperature as it applies to Pressurizer Pressure Control Malfunctions.

Tier: 1 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **Bank Direct (STP 2001 exam)**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Given a loss or malfunction of the Pressurizer Pressure Control system, describe the effects on the following: PCS (PPCS_CK11.0)

References: EOP Supplement 1 Steam Tables

Question:
Given the following plant parameters during a Primary Coolant System (PCS) heatup:

- PCS temperature is at 195º F
- Pressurizer pressure is 250 psia
- Pressurizer temperature is 380º F
- Pressurizer level is 100%
- P-50B PCP is the only Primary Coolant Pump in service.

A Pressurizer Pressure Control System malfunction causes both spray valves to open and remain open. Why does the reactor operator NOT expect to see an immediate reduction in Pressurizer pressure?

a. At this pressure and temperature, heat input is matching spray flow effectiveness.

b. Subcooling conditions are indicated in the pressurizer.

c. Pressurizer spray flow is inadequate for given conditions.

d. CVCS backpressure regulator will automatically open to maintain pressure.

DISTRACTOR ANALYSIS

a. Incorrect, since sprays would have the effect desired effect of reducing pressure with saturated conditions.
b. **CORRECT**, since this indication, using EOP Supplement 1 operating curves and Steam Tables, confirms that PZR conditions are subcooled.
c. Incorrect, since "B" PCP will supply sufficient driving head to provide adequate spray flow.
d. Incorrect, since pressure could still be maintained with this high level if a bubble were drawn in the PZR, but given parameters indicate lack of a bubble.

Cognitive Level: HIGH 2
Recognizing implications. Candidate is given a set of conditions, and then required to determine the implications of the failed spray valves operation.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 7

K/A: 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4 A1.01
Ability to operate and/or monitor manual and automatic ESFAS initiation as it applies to the Steam Line Rupture.

Tier: 1 **RO Imp:** 4.6 **RO Exam:** Yes **Difficulty:** 2
Group: 1 **SRO Imp:** 4.6 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: Given a reactor trip situation, from memory, perform the actions of EOP 1.0 in accordance with Operations Standards. (TBAB_T01.00)

References: EOP-1.0, BOP Operator Aid, rev 12

Question:
The Plant has tripped and the immediate actions of EOP-1.0 are in progress. It is noted that BOTH Steam Generator pressures are approximately 760 psia and lowering slowly.

Which one of the following actions is the operator required to perform?

a. Manually trip BOTH Main Feedwater pumps.

b. Manually initiate Safety Injection Actuation signal

c. Verify main steam isolation signal

d. Close BOTH Main Steam Isolation Valves

DISTRACTOR ANALYSIS

a. Excessive feedwater would cause a pressure reduction.
b. Candidate may believe an isolation/actuation is required.
c. Candidate may believe an isolation/actuation is required.
d. **CORRECT - This action is correct per the EOP and reduces severity of excessive cooldown and inventory loss from a faulted S/G.**

Cognitive Level: LOW
Memory of procedural steps, and specific facts. Candidate must recall an extremely important procedural requirement for the given conditions.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 8

K/A: CE/A11; W/E08 RCS Overcooling - PTS / 4 K2.02
Knowledge of the interrelations between the (RCS Overcooling) and the facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Tier: 1 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in-use Emergency Operating Procedure, in accordance with the Emergency Operating Procedure Bases Document (TBAD_TBCORE_CK01.0)

References: EOP-6.0, Basis, step 16

Question:
Given the following:

- A Main Steam Line Break has occurred upstream of the "B" S/G MSIV.
- Main Steam Line Isolation has automatically actuated.

Which one of the following is of concern if a steaming path from the unaffected steam generator is not established immediately following dryout of the affected steam generator?

a. Void formation in the Reactor Vessel upper head region.

b. Rise in core exit temperatures causing a loss of natural circulation.

c. Rapid rise in Tcold of the unaffected loop which would result in a loss of natural circulation.

d. Rapid repressurization of the Primary Coolant System and subsequent pressurized thermal shock.

DISTRACTOR ANALYSIS

a. Void formation is an undesirable condition, but the concern does not apply here.
b. Valid distractor since loss of natural circulation is a concern, but does not apply for given conditions.
c. Valid distractor since loss of natural circulation is a concern, but does not apply for given conditions.
d. **CORRECT - Prevents an uncontrolled heatup and repressurization.**

Cognitive Level: HIGH 2
Recognizing consequences or implications. Candidate is required to apply knowledge of cooling systems operation in the context of an overcooling event to determine the implications (operational concern) of the conditions.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 9

K/A: 000051 Loss of Condenser Vacuum / 4 A2.02
Ability to determine and interpret conditions requiring reactor and/or turbine trip as they apply to the Loss of Condenser Vacuum.

Tier: 1 **RO Imp:** 3.9 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **Bank Direct(2000 NRC Exam #C77)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given Off Normal plant conditions, determine if an immediate, manual Reactor Trip is required. (IOTF_CK05.0)

References: ONP-14, 2.0, and Table 4.3-1

Question:
Given the following conditions:

- The plant is operating at 85% power.
- Cooling Tower Pump 'B' trips.
- Main Condenser vacuum begins lowering, as prescribed by ONP-14, "Loss of Condenser Vacuum".
- The crew begins lowering power using ONP-26, Rapid Power Reduction.
- When power level reaches 55% during the power reduction, EK-0111, VACUUM LO, alarms due to vacuum at 24" Hg.
- Vacuum is at 22" and CONTINUES LOWERING.

Which of the following actions are required to be taken?

a. Trip the turbine, verify the reactor automatically trips, and go to EOP-1.0, Standard Post-Trip Actions.

b. Trip the reactor, verify the turbine automatically trips, and go to EOP-1.0, Standard Post-Trip Actions.

c. Continue the rapid power reduction until condenser vacuum stabilizes.

d. Continue the power reduction, using normal de-escalation rates, until condenser vacuum stabilizes.

DISTRACTOR ANALYSIS

a. Since turbine generator damage is the concern, candidate may believe turbine should be tripped first.
b. **CORRECT - It is not desired to allow the reactor to automatically trip; these are conditions where such an automatic trip is clearly imminent; therefore, manual action to trip is required.**
c. No RPS setpoint has been exceeded, so candidate may believe a trip is not required.
d. No RPS setpoint has been exceeded, so candidate may believe a trip is not required.

Cognitive Level: HIGH 2
Describing or recognizing implications. Candidate is given conditions of degraded vacuum and required to analyze these conditions and recognize the implications (i.e., exceeds reactor trip criteria.)

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 10

K/A: 000057 Loss of Vital AC Elec. Inst. Bus / 6 K3.01
Knowledge of the reasons for the actions contained in EOP for loss of vital AC electrical instrument bus as they apply to the Loss of Vital AC Instrument Bus.

Tier: 1 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** **4**

Group: 1 **SRO Imp:** 4.4 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.5, 41.10 / 45.6 / 45.13

Palisades Training Objective: Given Off Normal plant conditions, describe the mitigating strategy as it relates to the Operator actions contained in the applicable Off Normal Procedure. (IOTF_CK07.0)

References: ONP-24.5, 2.0, and 4.3, rev 19

Question:
Given the following conditions:

- The plant is in MODE 2.
- Charging Pump P-55A is operating.
- Charging Pumps P-55B and P-55C are in AUTO.
- All control systems are aligned normally and functioning properly.
- A loss of Instrument AC Bus Y-01 occurs.

Which of the following describes why ONP-24.5, "Loss of Instrument AC Bus Y01" directs the operators to isolate PCP bleedoff from the Volume Control Tank (VCT) and realign it to the Primary System Drain Tank?

a. Minimizes the likelihood of gas intrusion in to the PCP seals.

b. Minimizes the amount of pressure reduction in the VCT.

c. Prevents a complete draining of the VCT.

d. Prevents overfilling of the VCT.

DISTRACTOR ANALYSIS

a. Candidate misinterprets the DIRECTION of inventory/energy exchange between VCT and PCP bleedoff.
b. Candidate misinterprets the DIRECTION of inventory/energy exchange between VCT and PCP bleedoff.
c. Candidate completely misinterprets interface between VCT and PCP seal bleedoff.
d. **CORRECT - Since VCT outlet valve fails closed on loss of Y-01, there is no path out of the VCT. Continuing to flow PCP bleedoff to the VCT will overfill it.**

Cognitive Level: LOW
Recall procedural steps and cautions. Candidate must recognize plant conditions that require a realignment and the reason for this action.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 11

K/A: 000062 Loss of Nuclear Service Water / 4 K3.02
Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting form the actuation of the ESFAS.

Tier: 1 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.4, 41.8 / 45.7

Palisades Training Objective: SWS_CK24.0
From memory, state the automatic response of the Service Water System for Recirculation Actuation Signal.

References: DBD 1.02, page 22 of 152

Question:
Given the following plant conditions:

- During power operations a Large Break Loss of Coolant Accident (LOCA) has occurred.
- A Safety Injection has occurred as designed.
- A Containment High Pressure (CHP) also occurred as designed.
- 30 minutes later the Safety Injection & Refueling Water Tank level is at 1.8%.

(Refer to the attached drawing.)
What is the expected response of the highlighted valves (CV-0823 and CV-0826) and what is the reason for that response?

a. Failed AS IS to provide a gradual cooling of the containment sump fluid.

b. Modulating to provide a gradual cooling of the containment sump fluid.

c. Opened to a preset hardstop to provide maximum cooling for containment spray and safety injection recirculation flow.

d. Closed to a preset hardstop to ensure maximum cooling water flow is maintained for the Containment Air Coolers.

DISTRACTOR ANALYSIS

a. There are many plant valves that fail as is. A "gradual" cooling sounds like a desireable attribute.
b. Candidate incorrectly believes the given conditions do not affect these valves.
c. **CORRECT - Provides maximum service water flow and cooling to the CCW Hxs.**
d. Candidate correctly believes that maximum cooling water flow is needed, but selects the incorrect final position of the valves.

Cognitive Level: HIGH 2
Rephrasing information; recognizing relationships; describing implications; how systems interact. Candidate must apply a number of knowledge items (the fact that CHP actuates containment spray, that 1.8% on SIRW Tank initiates a RAS, and this requires additional cooling, etc.) to predict an outcome and the implications of that outcome.

K/A Match Assessment: **ADEQUATE**

References Supplied to Candidate: Attached drawing of CV-0823, CV-0826

WRITTEN QUESTION DATA SHEET

Question Number: 12

K/A: 000067 Plant Fire On-site / 9 A2.06
Ability to determine and interpret the need for pressurizing control room (recirculation mode) as it applies to the Plant Fire On-site.

Tier: 1 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Describe the design features and interlocks that provide for the following Control Room HVAC System functions: Shifting of ventilation operating modes (CRHV_CK09.0)

References: SOP-24, 7.7.7, rev 36 M-218 DBD 1.06

Question:
Given the following conditions:

- There is a fire at the north end of the Service Building.
- This fire is generating a significant amount of smoke.
- NO radiological event is in progress.
- Wind direction is from due North at 5 to 10 miles per hour.

For these conditions, there is a need to operate the Control Room HVAC system in the Recirculation mode because it will ...

a. pressurize the Control Room envelope, thereby preventing entry of smoke and other contaminants.

b. filter out smoke through the charcoal filters, thereby preserving habitability of the Control Room envelope.

c. minimize smoke intake in the Control Room envelope, and also protect the charcoal filters.

d. maximize fresh air intake and purge the Control Room envelope of any smoke particles.

DISTRACTOR ANALYSIS

a. Correctly believes prevention of smoke entry is desireable, but misses the concern for charcoal filter protection.
b. Certain filters do filter out smoke, but this is not the design function of these charcoal filters.
c. **CORRECT - Since smoke is outside and wind is blowing it toward the HVAC intake, shutting off this intake will minimize smoke in the Control Room.**
d. Correctly believes prevention of smoke particles is desireable, but misses the importance of NOT bringing in fresh air since the location of the intake is where the smoke is being generated.

Cognitive Level: HIGH 2
Describing implications. Candidate is given a set of conditions and required to determine the importance and implications of operating the Control Room HVAC in a certain mode, and how that mode operation is beneficial for the given conditions.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 13

K/A: 000069 (W/E14) Loss of Containment Integrity / 5 K1.01
Knowledge of the operational implications of the effect of pressure on leak rate as it applies to Loss of Containment Integrity.

Tier: 1 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Given transient plant conditions resulting in a reactor trip and, given control room indications, determine the impact those indications have on each safety function. (TBAB_E01.05)

References: EOP-1.0, Primary Operator Aid

Question:
Given the following initial plant conditions:

- The plant is at 100% power.
- The Personnel Air Lock between the seals test (DWO-13) has just been completed and BOTH seals have FAILED.

Subsequent plant conditions:

- A Main Steam Line Break inside containment occurs on the "A" Steam Generator (S/G).
- EOP-1.0, "Standard Post Trip Actions" is in progress.
- P-8A Aux. Feedwater Pump is in service providing 165 gpm to each S/G.
- A Containment High Pressure (CHP) has actuated.
- SIRW tank level is at 85% at lowering.
- CV-0510 "A" S/G MSIV is stuck OPEN and will not close by any means.
- CV-1359 (Non-Critical Service Water Isolation) did NOT automatically close.
- P-52C Component Cooling Water Pump did NOT automatically start.

Which one of the following operations will result in a REDUCTION of leakage out of the failed Personnel Air Lock seals?

a. Manually start P-52C Component Cooling Water Pump.

b. Manually close CV-1359 (Non-Critical Service Water Isolation).

c. RAISE Auxiliary Feedwater flow to "A" S/G to 200 gpm.

d. LOWER Auxiliary Feedwater flow to "B" S/G to 100 gpm.

DISTRACTOR ANALYSIS

a. Incorrectly believes CCW is the cooling source for containment air coolers.
b. **CORRECT - This action should have occurred on the SIAS. Manually closing will ensure more service water cooling where it is needed (Containment Air Coolers), which will reduce containment pressure, thereby reducing leak rate out the air lock seals.**
c. Misapplies the result of feeding a steam generator. This may actually worsen the leak rate since more inventory is being added to containment.
d. Incorrectly believes the "good" and the "faulted" generator are separated.

Cognitive Level: HIGH 3
Solve a problem; integrating the parts. Question requires a high degree of analysis and synthesis to solve a containment integrity problem. Candidate must understand the given plant conditions cause a Safety Injection which SHOULD close CV-1359 (but did NOT), and what this means. Closing CV-1359 will provide a significant amount of additional containment cooling, which in turn will reduce containment pressure, and thereby reduce leakage out of the failed air lock.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: None

Question Number: 14

K/A: 000076 High Reactor Coolant Activity A2.02
Ability to determine and interpret corrective actions required for high fission product activity in RCS as they apply to the High Reactor Coolant Activity.

Tier: 1 **RO Imp:** 2.8 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given Off Normal plant conditions, describe the mitigating strategy as it relates to the Operator actions contained in the applicable Off Normal Procedure. (IOTF_CK07.0)

References: ONP-11.1, rev 17

Question:
Given the following:

- During a power escalation at 18% power, Containment Radiation Monitors are indicating as follows:

  RIA-1805 = 8 R/hr. RIA-1806 = 11R/hr.
  RIA-1807 = 10.5R/hr. RIA-1807 = 8 R/hr.

- A fuel cladding failure has been verified.
- The crew has entered ONP-11.1, "Fuel Cladding Failure".

Which one of the following describes the reason for any required actions?

a. Manual alignment of Control Room HVAC to Emergency mode is required to maintain Control Room habitability.

b. Operators are required to close Letdown Orifice Stop Valves, since letdown has automatically isolated.

c. Operators must closely monitor Pressurizer level and maintain it at less than 78.2% since letdown has automatically isolated.

d. Since the Stack Gas Monitor is expected to be in high alarm, operators are required to start an additional Main Exhaust Fan, V-6A/B.

DISTRACTOR ANALYSIS

a. Correctly believes Emergency mode is required, but incorrectly applies it by thinking it is NOT automatically actuated (it is).
b. **CORRECT - This action is correct per the procedure, and ensures a controlled restoration of letdown when conditions allow.**
c. 68.2% is the maximum Pressurizer level allowed for all operating conditions. Misapplies the limit, and misapplies relationship between CVCS and pressurizer for the given conditions.
d. Misapplies the function of Stack Gas system.

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate is given a set of conditions to evaluate and the determine the consequences and any required actions.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 15

K/A: 000001 Continuous Rod Withdrawal A1.07
Ability to operate and/or monitor RPI as it applies to the Continuous Rod Withdrawal.

Tier: 1 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **2**

Group: 2 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: For the Plant Process Computer (PPC):
b. Describe the Control Room instrumentation and controls. (PPC_CK08.0)

References: DBD-2.06

Question:
During a critical approach, all Group 4 Regulating Rods start to continuously withdraw with NO operator action. What Control Room indications can be used to determine that a continuous rod withdrawal is occurring?

a. Associated core matrix indicating lights change from RED to AMBER.

b. EK-0911, "ROD POSITION 4 INCHES DEVIATION" annunciates.

c. Rod Deviation (RED) light is ON for Group 4 rod indicating lights on control panel C-02.

d. PPC GREEN indicating bars on Page 410 for Group 4 rod positions are getting SHORTER.

DISTRACTOR ANALYSIS

a. This is one indication available, but candidate misapplies the conditions, since it actually indicates rod *insertion.*
b. This alarm would annunciate, but it would NOT be the determining indication for these conditions.
c. This indication would exist, but it would NOT be the determining indication for these conditions, since this light only means that some type of deviation exists, and not specific to a rod withdrawal.
d. **CORRECT - This is a valid indication to diagnose the condition.**

Cognitive Level: HIGH 2
Recognizing implications or consequences. Candidate is given a continuous rod withdrawal condition and required to determine which is the resulting expected rod position indication.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 16

K/A: 000003 Dropped Control Rod / 1 K2.05
Knowledge of the interrelations between the Dropped Control Rod and control rod drive power supplies and logic circuits.

Tier: 1 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 2.8 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Predict how the following conditions will impact operation of the Control Rod Drive System: (CRD_CK13.0) * EK-0917, "ROD WITHDRAWAL PROHIBIT"

References: SOP-6, 7.8.b, rev 20 ARP-5, windows 16, 17, rev 64

Question:
Which one of the following conditions would PREVENT retrieval of a dropped control rod?

a. EK-0916, "CONTROL RODS OUT OF SEQUENCE" is annunciating.

b. Motor Control Center 10 is de-energized for diagnostic testing.

c. Rod Drive Control System power supply switch is in "Bus #2" position.

d. EK-0917, "ROD WITHDRAWAL PROHIBIT" is annunciating.

DISTRACTOR ANALYSIS

a. This sounds valid, and this alarm would be in, but it would NOT prevent rod withdrawal.
b. Candidate incorrectly believes rod drive power is from this Motor Control Center.
c. By itself, this condition would NOT prevent rod withdrawal, although it does control rod drive motor power supplies.
d. **CORRECT - While this may seem like an obviously correct answer, the other distractors required the candidate to carefully scrutinize them also. Per the alarm response, this condition would prevent rod withdrawal.**

Cognitive Level: HIGH 2
Recognizing consequences or implications. Candidate is required to evaluate several conditions and through application of comprehension of each of the conditions given in the distractors, determine the implications in context of a dropped rod.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 17

K/A: 000008 Pressurizer Vapor Space Accident / 3 K1.01
Knowledge of the operational implications of thermodynamics and flow characteristics of open or leaking valves as they apply to a Pressurizer Vapor Space Accident.

Tier: 1 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty: 3**
Group: 2 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Given plant conditions, predict downstream temperature from a lifting or leaking PORV. (PCS_E01.03)

References: Steam Tables, Mollier diagram

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

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

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

a. 532º F

b. 360º F

c. 315º F

d. 212º F

DISTRACTOR ANALYSIS

a. Candidate incorrectly uses Mollier diagram.
b. Candidate incorrectly uses Mollier diagram.
c. **CORRECT - Proper use of Steam Table/Mollier diagram yields this response.**
d. Candidate incorrectly uses Mollier diagram.

Cognitive Level: HIGH 3
Solve problems. Requires candidate to solve a problem of a leaking Pressurizer code safety valve and arrive at an expected parameter value which would aid in diagnosing the condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 18

K/A: 000009 Small Break LOCA / 3 K1.01
Knowledge of the operational implications of natural circulation and cooling, including reflux boiling as they apply to the small break LOCA.

Tier: 1 **RO Imp:** 4.2 **RO Exam:** Yes **Difficulty:** **4**
Group: 2 **SRO Imp:** 4.7 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Given a set of accident data, evaluate parameters to determine if natural circulation is occurring IAW the in-use EOP. (TBAC_E02.04)

References: EOP-4.0 Basis, page 4, rev 13 Steam Tables

Question:
Following a small break LOCA, the following conditions are observed:

- Core exit thermocouple temperatures are approximately 650°F and stable.
- PCS hot leg temperatures are approximately 550°F and stable.
- Pressurizer pressure is 1100 psia.
- PCS cold leg temperatures are approximately 330°F and lowering slowly.

What is the status of PCS inventory and core cooling? The core is ...

a. covered and being cooled by natural circulation.

b. partially uncovered and being cooled by natural circulation.

c. covered and being cooled by reflux boiling.

d. partially uncovered and being cooled by reflux boiling.

DISTRACTOR ANALYSIS

a. Incorrect use of steam tables.
b. Incorrect use of steam tables.
c. Incorrect use of steam tables.
d. **CORRECT - Steam Tables indicates superheated conditions. Cold leg temperatures slowly reducing indicate heat is being removed by some mechanism (i.e., reflux method).**

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate is given a set of conditions and required to interpret the meaning, significance, and operational implications of the set of conditions.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 19

K/A: 000025 Loss of RHR System / 4 A1.09
Ability to operate and/or monitor LPI pump switches, ammeter, discharge pressure gauge, flow meter, and indicators as they apply to the Loss of Residual Heat Removal System.

Tier: 1 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: For the following Safety Injection System major components,:(SIS_CK02.0) LPSI Pumps (P-67A/B), describe normal operating range of the component

References: ONP-17

Question:
The plant was on Shutdown Cooling when a loss of Shutdown Cooling occurred due to a seized bearing on P-67A Low Pressure Safety Injection (LPSI) Pump. The crew is now ready to start the alternate LPSI Pump (P-67B) to restore shutdown cooling flow.

Which one of the following flow rates for P-67B is the MINIMUM acceptable flow rate for pump protection?

a. 150 gpm

b. 250 gpm

c. 500 gpm

d. 2810 gpm

DISTRACTOR ANALYSIS

a. Candidate does not accurately recall the flow requirement. This number looks similar, but is incorrect.
b. **CORRECT - The minimum required flow rate for pump protection is 170 gpm; therefore 250 gpm is the lowest allowable flow of the choices.**
c. This flow is the minimum required for loop check valves operation. Incorrectly applied here.
d. Another unrelated flow limit. (minimum PCS recirc flow for certain conditions).

Cognitive Level: LOW
Recall specific facts; procedural steps or cautions. Candidate is required to recall and recognize a minimum acceptable parameter of an operating pump.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 20

K/A: 000032 Loss of Source Range NI / 7 K2.01
Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and power supplies, including proper switch positions.

Tier: 1 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **Bank Direct (2001 NRC R41)**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given a loss or malfunction of the NI System describe the effects on the following: Reactor Protection System (CK11.0)

References: SOP-35, 7.1.2, rev 14 ARP-21, A-2, rev 48

Question:
Source/Wide Range NI - 1/3A must be taken out of service. Prior to removing NI - 1/3A from service, which of the following conditions regarding the High SUR Trip RPS channels would be acceptable? (Assume all other Technical Specification requirements are met.)

	RPS 'A'	'RPS 'B'	RPS 'C'	RPS 'D'
a.	NORMAL	BYPASS	NORMAL	TRIP
b.	BYPASS	NORMAL	TRIP	NORMAL
c.	TRIP	NORMAL	NORMAL	BYPASS
d.	NORMAL	TRIP	BYPASS	NORMAL

DISTRACTOR ANALYSIS

a. NI-3A inputs RPS channels 'A' and 'C'. Select since a channel is placed in trip and a channel is placed in bypass.
b. **Correct** - NI-3A inputs RPS channels 'A' and 'C'. One must be placed in trip and the other in bypass.
c. NI-3A inputs RPS channels 'A' and 'C'. Select since a channel is placed in trip and a channel is placed in bypass.
d. NI-3A inputs RPS channels 'A' and 'C'. Select since a channel is placed in trip and a channel is placed in bypass.

Cognitive Level: LOW
Recall or recognition of setpoints, patterns, or specific facts. Although this question appears relatively complex at first, it is a low cognitive question. It requires the candidate to recall requirements for RPS channel operation when compensating for failed instruments.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 21

K/A: 000037 Steam Generator Tube Leak / 3 K3.10
Knowledge of the reason for automatic actions associated with high radioactivity in S/G sample lines as they apply to the Steam Generator Tube Leak.

Tier: 1 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **4**
Group: 2 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5, 41.10 / 45.6 / 45.13

Palisades Training Objective: For automatic actions associated with the Radiation Monitoring System: (RMS_CK10.0)
* State the parameter and value (setpoint) at which the automatic action occurs
* Explain the purpose of each automatic actuation

References: ARP-8, window 65, rev 62; EOP-5 Basis, page 28, rev 10

Question:
The alarm "PROCESS LIQ MONITORING HI RADIATION" annunciates due to a high alarm condition on RIA-0707, Steam Generator Blowdown Radiation Monitor.

The following valve positions are subsequently noted:

CV-0704, Blowdown Tank Discharge to Mixing Basin	CLOSED
CV-0738, 'B' S/G Surface Blowdown	CLOSED
CV-0739, 'A' S/G Surface Blowdown	CLOSED
CV-0770, 'B' S/G Bottom Blowdown	OPEN
CV-0771, 'A' S/G Bottom Blowdown	OPEN

Which of the following is the correct diagnosis of the above valve positions?

a. Per design. S/G sampling capability is maintained through bottom blowdown CVs, and secondary plant contamination is minimized by closing the surface blowdown CVs.

b. Per design. S/G sampling capability is lost since the surface blowdown CVs are closed. Bottom blowdown CVs remain open to allow further trending of RIA-0707.

c. NOT per design. ALL valves should be CLOSED to prevent secondary plant contamination.

d. NOT per design. ALL valves should remain OPEN to maintain full S/G sampling capability.

DISTRACTOR ANALYSIS

a. Incorrectly believes valves responded as expected.
b. Incorrectly believes valves responded as expected.
c. **CORRECT - Closing of the valves ensures radiation release potential is minimized.**
d. Correctly believes valves did not respond as expected, but misapplies valve position required for sampling.

Cognitive Level: HIGH 2
Recognizing how systems interact, and describing implications. Candidate is given the status of certain valves following a high radiation conditions and required to evaluate the response of the system and valves, and to describe the implications of this response.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 22

K/A: 000054 (CE/E06) Loss of Main Feedwater / 4 A2.05
Ability to determine and interpret status of MFW pumps, regulating and stop valves as it applies to the Loss of Main Feedwater (MFW).

Tier: 1 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given emergency conditions involving a loss of all feedwater, feed a Steam Generator with a Condensate Pump in accordance with EOP 7.0, Loss of All Feedwater Recovery or EOP 9.0, Functional Recovery Procedure, Success. (TBAE_T03.00)

References: Provide EOP Supp 41

Question:
Given the following conditions:

- EOP-7.0, Loss of All Feedwater, actions are in progress.
- The crew is implementing a cooldown in order to use the Condensate Pumps for feeding the Steam Generators (S/G).
- Feed Reg Bypass Valves (CV-0734, CV-0735) have been positioned to 10% open as read on valve position indicators on panel C-01.

Given the following information:

Feed pump discharge pressure = 500 psia
S/G pressure = 420 psia

how much flow is being delivered to EACH S/G from the Condensate Pumps?

a. 300 gpm

b. 100 gpm

c. 140 gpm

d. 125 gpm

DISTRACTOR ANALYSIS

a. Uses incorrect point on curve.
b. Uses incorrect point on curve.
c. Uses incorrect point on curve
d. **CORRECT - Proper use of EOP Supplement yields 125 gpm.**

Cognitive Level: HIGH 3
Solve problems; recognize relationships. Candidate is given a set of conditions involving loss of feedwater, and then required to apply knowledge of procedural usage to determine the status of the associated valves, and interpret this as it relates to amount of delivered flow to the steam generators.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: EOP Supplement 41

Question Number: 23

K/A: 000059 Accidental Liquid RadWaste Rel. / 9 K1.01
Knowledge of the operational implications of types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant as they apply to Accidental Liquid Radwaste Release.

Tier: 1 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Explain the purpose of the Process Radiation Monitoring System in accordance with the FSAR. (RMS_CK01.0-2)

References: COP-31, 33

Question:
Which one of the following operations is performed at Palisades that reduces the potential consequences if an Accidental Liquid Radwaste Release event were to occur?

a. Maintaining the Spent Fuel Pool level above the low level alarm setpoint.

b. Minimizing the amount of weir overflow from the Makeup Basin to the Mixing Basin.

c. Recirculating T-91 Utility Water Storage Tank through demineralizers if the normal value of gamma (in μCi/ml) is exceeded.

d. Maximizing Cooling Tower blowdown in order to ensure the amount of tritium (in μCi/ml) is maintained below allowable limits.

DISTRACTOR ANALYSIS

a. Reduces dose levels, but does nothing to reduce consequences of a spill or release.
b. Palisades maximizes this overflow.
c. **CORRECT - T-91 sits right on the beach just feet away from Lake Michigan. Recirculation through demineralizers, along with the specified activity limit, reduces potential release consequences.**
d. Palisades minimizes cooling tower blowdown for plant efficiency.

Cognitive Level: LOW
Recall specific facts. Candidate must recall a specific operational concern and how it is addressed in day to day operations.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 24

K/A: 000060 Accidental Gaseous Radwaste Rel. / 9 K1.01
Knowledge of the operational implications of types of radiation, their units of intensity and the location of sources of radiation in a nuclear power plant as they apply to Accidental Gaseous Radwaste Release.

Tier: 1 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Explain the purpose of the Process Radiation Monitoring System in accordance with the FSAR. (RMS_CK01.0-2)

References: COP-1, Att. 10, rev 50 FSAR 14.21, rev 23

Question:
For a rupture of the Volume Control Tank and subsequent gaseous release, what operational requirement ensures required dose limits are not exceeded?

a. Limiting primary coolant gross gamma activity to less than 100 μCi/gm.

b. Maintain a hydrogen overpressure on the Volume Control Tank in MODE 1.

c. Ensuring primary coolant lithium concentration is less than 1.0 ppm.

d. Operating with no more than 3% failed fuel in all plant modes.

DISTRACTOR ANALYSIS

a. **CORRECT - Letdown from the PCS flows to the VCT; the limit for PCS activity then ensures release consequences are minimized.**
b. Correctly recalls a hydrogen overpressure in VCT, but misapplies it, since it has reduces corrosion.
c. Lithium is a chemistry parameter of the PCS, but candidate misapplies the information here.
d. Limiting failed fuel does effect release severity, but the limit is 1%.

Cognitive Level: LOW
Recall specific facts. Candidate must recall a specific operational concern and how it is addressed in day to day operations.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 25

K/A: 000061 ARM System Alarms / 7 K2.01
Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms and detectors at each ARM system location.

Tier: 1 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 2.6 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Explain the purpose of interfaces (physical connections) between the Radiation Monitoring System and other plant systems: Control Room Ventilation (RMS_CK06.0)

References: SOP-24, 4.3.3, rev 36

Question:
Given the following conditions:

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

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

a. If a CHP/CHR occurs ONLY the operating train will FAIL to automatically swap to Emergency Mode.

b. If a CHP/CHR occurs NEITHER train will automatically swap to Emergency Mode.

c. Due to the loss of RIA-1818A, any radioactive contamination entering the Control Room from the outside will not be detected.

d. Due to the loss of RIA-1818A, Train "A" CRHVAC automatically swaps to Purge Mode and the Control Room depressurizes.

DISTRACTOR ANALYSIS

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

Cognitive Level: HIGH 2
Describe or recognize consequences or implications. Candidate is provided with the status of a component in the Area Radiation Monitoring System and then required to describe the implications of this condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 26

K/A: CE/E09 Functional Recovery K1.02
Knowledge of the operational implications of normal, abnormal, and emergency operating procedures associated with (Functional Recovery).

Tier: 1 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.8 / 41.10 / 45.3

Palisades Training Objective: Given Off Normal plant conditions, describe the mitigating strategy as it relates to the Operator actions contained in the applicable Off Normal Procedure. (IOTF_CK07.0)

References: ONP-25.1, rev 12 EOP-9.0, CA Attachment G-1, rev 16

Question:
The crew is implementing ONP-25.1, "Fire Which Threatens Safety-Related Equipment" for a fire inside containment.

Why does ONP-25.1 refer the operators to EOP-9.0, "Functional Recovery Procedure" Attachment G-1 for these conditions?

a. Determine which Success Paths are available for mitigating the event.

b. Establish the hierarchy of which safety functions to address first.

c. Establish which Continuing Actions to perform after the fire is out.

d. Determine actions for inoperable instrumentation inside containment.

DISTRACTOR ANALYSIS

a. Incorrectly applies functional recovery procedure usage for given conditions.
b. Incorrectly applies functional recovery procedure usage for given conditions.
c. Incorrectly applies functional recovery procedure usage for given conditions.
d. **CORRECT - Per the specified Attachment G-1.**

Cognitive Level: LOW
Knowledge of procedural steps. Candidate is required to recall the purpose for a procedural section.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 27

K/A: 000028 Pressurizer Level Malfunction / 2 K2.03
Knowledge of the interrelations between the Pressurizer Level Control Malfunctions and controllers and positioners.

Tier: 1 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** 3
Group: 3 **SRO Imp:** 2.9 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given a loss or malfunction of the Pressurizer Level Control System, including loss of inputs, describe the effects on the following: Pressurizer Level Control System (PLCS_CK11.0)

References: DBD 1.04

Question:
Given the following conditions:

- Plant is at 100%.
- Level Controller LIC 0101B is in CASCADE.
- Level Control Selector is in Channel B.
- Pressurizer level transmitter LT-0101B diaphragm ruptures.

What is the resulting effect on actual Pressurizer level and the reason for it?

a. Level LOWERS due to the controller's normal level control signal ramping to letdown.

b. Level LOWERS due to the unselected controller's backup signal overriding the failed signal.

c. Level RISES due to the backup signal being calculated from Tave and overriding the failed signal.

d. Level RISES due to the controller's normal level control signal ramping to charging.

DISTRACTOR ANALYSIS

a. **CORRECT - Equalization of level (wet reference leg) on both sides of the diaphragm is sensed as a high level in the Pressurizer, normal level control program will function to reduce level.**
b. Correctly determines final result, but for the incorrect reason. Backup program does not apply since normal program has not failed.
c. Incorrect final result for the incorrect reason.
d. Incorrect final result for the *almost* correct reason (signal ramps to LETDOWN, not charging.)

Cognitive Level: HIGH 3
Predict an outcome. Candidate is required to evaluate a malfunction of the Pressurizer level control system and predict the result (outcome) of the conditions.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 28

K/A: CE/A16 Excess RCS Leakage / 2 K2.02
Knowledge of the interrelations between the (Excess RCS Leakage) and the facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Tier: 1 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** **3**
Group: 3 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given a Loss Of SDC due to a Loss Of LPSI Pump/Piping, operate the controls to restore SDC in accordance with ONP-17, Loss Of Shutdown Cooling. (IOTF1_T11.00)

References: ARP-7, windows 57 and 58, rev 64 SOP-3, 5.2.3, rev 52 DBD 2.01, page 67, rev 7

Question:
Given the following plant conditions:

- The plant is on shutdown cooling (SDC) in reduced inventory.
- P-67A LPSI Pump is in service. P-67B is NOT running.
- All SDC system controls are aligned normally.
- A leak develops in the Primary Coolant System.
- A moment or two later LPSI injection flow becomes erratic and the following valid alarm then annunciates:

  * EK-1157, LO PRESS SI PUMPS P-67A & P-67B TRIP

Which one of the following describes any required operator actions for these conditions?

a. Closely monitor operating parameters of P-67B since it has auto started, and there are potential cavitation concerns.

b. Since the LPSI Pump STANDBY auto start feature is not used, the operator must manually start P-67B to maintain SDC flow.

c. Since the LPSI Pump STANDBY auto start feature is not used, the operator must report that a Loss of Shutdown Cooling event has occurred.

d. The operator should attempt only one restart of P-67A to prevent exceeding motor starting duty limitations and to avoid a loss of shutdown cooling.

DISTRACTOR ANALYSIS

a. The STANDBY feature of the LPSI pumps is administratively prohibited.
b. Manually starting of the alternate pump under these conditions could damage the pump due to cavitation.
c. **CORRECT - Crew must be aware of the conditions, since an ONP will be entered to address the condition.**
d. There are starting duty limitations on pumps but candidate misapplies it here. Restarting the pump which just tripped could damage the pump due to repeated cavitation potential.

Cognitive Level: HIGH 2
Recognizing implications and potential consequences. Candidate must apply knowledge of system operation to realize the implications of certain actions.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 29

K/A: 001 Control Rod Drive K3.02
Knowledge of the effect that a loss or malfunction of the CRDS will have on the RCS.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** 3.5 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.7 / 45.6

Palisades Training Objective: Given a loss or malfunction of the Control Rod Drive System, describe the effects on the Reactor Core, in accordance with the FSAR. (CRD_CK11.0b)

References: EOP-1.0 Basis, page 4 of 103, rev 10

Question:
What is the concern for two adjacent control rods that are determined to be untrippable, but moveable?

a. On a reactor trip a portion of the core would have excess reactivity until the two rods could be inserted.

b. For an emergency downpower the Axial Shape Index (ASI) could not be maintained within the prescribed band.

c. On a reactor trip the required Shutdown Margin could not be achieved using Emergency Boration.

d. For an emergency downpower the Power Dependent Insertion Limits would be violated for the two affected rods.

DISTRACTOR ANALYSIS

a. **CORRECT - Per given basis document.**
b. Correct in being concerned about ASI, however ASI limits do not apply for emergencies.
c. Correct in having a concern for Shutdown Margin, but emergency borartion would be effective.
d. PDIL limits do not apply during an emergency downpower.

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate is given a condition involving control rods and required to determine the implications (effects) of the condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number:30

K/A: 003 Reactor Coolant Pump K5.05
Knowledge of the operational implications of the dependency of RCS flow rates upon the number of operating RCPs as they apply to the RCPS.

Tier: 2 **RO Imp:** 2.8 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** 3.0 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.5 / 45.7

Palisades Training Objective: Given a loss or malfunction of the PCPs, describe the effects on the following:
PCS (PCP_CK11.0)

References: FSAR 14.7.1.1

Question:
Assume the Plant is in MODE 3 with both Steam Generators available. Which statement describes the effect on the Primary Coolant System (PCS) of the number of operating Primary Coolant Pumps (PCPs)?

a. Operating ALL PCPs raises PCS flow rate, but results in a reduction in DNB margin due to pump heat input.

b. Fifteen minutes after shutting off ALL PCPs there will be NO flow in the PCS, and margin to DNB will be reduced.

c. Reducing the number of operating PCPs lowers the PCS flow rate which causes a RISE in DNB margin.

d. Reducing the number of operating PCPs lowers the PCS flow rate which causes a REDUCTION in DNB margin.

DISTRACTOR ANALYSIS

a. Correct effect on flow rate, but incorrect result in DNB margin.
b. Natural circulation will develop in approx. 10 minutes, though candidate correctly interprets effects if there were no flow.
c. Incorrectly applies use of term DNB margin.
d. **CORRECT - PCS temperatures will rise, resulting in reduction of DNB margin.**

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate is required to determine the implications of the number of operating primary coolant pumps.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:31

K/A: 004 Chemical and Volume Control K1.17
Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the PZR.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **3**
Group: 2 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Given plant conditions requiring use of the Auxiliary Spray System, control Pressurizer pressure using Auxiliary Spray IAW EOP Supplement 37. (TBAC_T04.00)

References: EOP Supplement 37, 1.0.7 NOTE

Question:
The crew is implementing EOP-8.0, "Loss of Forced Circulation Recovery" and is using Auxiliary Spray to control Pressurizer pressure. TWO Charging Pumps are in service.

If the operator desires to REDUCE Pressurizer pressure, which of the following methods should be used?

a. Start a third Charging Pump and open the Main Spray valves.

b. Start a third Charging Pump and close the Main Spray valves.

c. Shutoff one Charging Pump and open the Main Spray valves.

d. Shutoff one Charging Pump and close the Main Spray valves.

DISTRACTOR ANALYSIS

a. Raises flow , but not where needed. Opening main sprays would actually REDUCE aux spray flow.
b. **CORRECT - Since use of Main Spray valves is OPPOSITE from normal, starting a third charging pump and CLOSING Main Spray valves actually raises aux spray flow and reduces Pressurizer pressure.**
c. Incorrectly believes opening main spray valves would raise needed spray flow.
d. Correct understanding of main spray valve operation, but incorrectly applied for charging flow.

Cognitive Level: HIGH 2
Recognize relationships, how systems interact. In order to answer this question, candidate must understand and apply knowledge of the relationship between the Chemical and Volume Control System and the Pressurizer.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:32

K/A: 013 Engineered Safety Features Actuation A1.10
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ESFAS controls including T-cold.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **2**

Group: 1 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45.5

Palisades Training Objective: Given plant conditions or an event involving Emergency Operating Procedures, throttle Safety Injection to maintain Pressurizer level in accordance with the in-use EOP. (TBAD_T06.00)

References: EOP-4.0 Basis, p. 75

Question:
Given the following conditions:

- A small break LOCA has occurred and the Control Room crew is performing the actions of EOP-4.0, "Loss of Coolant Accident Recovery".
- Pressurizer pressure is 980 psia and very slowly lowering.
- A plant cooldown has been initiated using the Steam Generators and Auxiliary Feedwater.
- Safety Injection throttling criteria have been met and the operator is ready to throttle Safety Injection by shutting off one HPSI pump.

What plant response should the operator expect when throttling Safety Injection for the above conditions?

a. The cooldown rate will LOWER unless the operator raises the steaming rate.

b. The cooldown rate will RISE unless the operator lowers the steaming rate.

c. The resulting unbalanced loop injection flows will interrupt natural circulation unless the operator raises the steaming rate.

d. The resulting Pressurizer pressure reduction may result in core voiding unless the operator lowers the steaming rate.

DISTRACTOR ANALYSIS

a. **CORRECT - The cooler HPSI flow is no longer providing cooling to the PCS. This will require an adjustment on the secondary side to maintain desired cooldown rate.**
b. Incorrect understanding of the relationship of HPSI flow to pressurizer pressure.
c. Candidate believes shutting of HPSI pump would cause flow perturbations of such significance to interrupt natural circulation.
d. Candidate exaggerates any small, if even detectable, amount of pressure reduction that would occur.

Cognitive Level: HIGH 3
Predict an outcome; solve a problem. Candidate must analyze the given conditions and apply other knowledges to predict the effect on cooldown rate; and then solve the problem of what to do about the predicted effect.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number:33

K/A: 015 Nuclear Instrumentation K2.01
Knowledge of bus power supplies to NIS channels, components, and interconnections.

Tier: 2 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: List the power supplies for the following NI System components: (CK07.0) Source Range Detectors, Wide Range Detectors, Power Range Detectors.

References: SOP-35, Attachment 2, page 2 of 8, rev 14

Question:
Which of the following lists the normal power supplies for the indicated Nuclear Instruments?

	NI-1	NI-2	NI-3	NI-4	NI-5	NI-6
	NI-7	NI-8				
a.	Y10	Y20	Y10	Y20	Y30	Y40
	Y30	Y40				
b.	Y40	Y30	Y40	Y30	Y10	Y20
	Y10	Y20				
c.	Y30	Y40	Y30	Y40	Y10	Y20
	Y30	Y40				
d.	Y10	Y20	Y30	Y40	Y10	Y20
	Y30	Y40				

DISTRACTOR ANALYSIS

a. Does not accurately recall the power supplies.
b. Does not accurately recall the power supplies.
c. **CORRECT - Correct power supplies.**
d. Does not accurately recall the power supplies.

Cognitive Level: LOW
Recall specific facts. Candidate must recall the power supplies for NI components.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:34

K/A: 017 In-core Temperature Monitor K1.01
Knowledge of the physical connections and/or cause-effect relationships between the ITM system and the Plant computer.

Tier: 2 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** 3.2 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: For the Plant Process Computer: (PPC_CK08.0)
c. List the alternate or remote indications

References: FSAR 7.6 SOP-34, 4.2, rev 16

Question:
The Cutler-Hammer Interface has failed and therefore QCET indication is not available on the PPC.

QCET temperatures can then be monitored using which one of the following?

a. TYT-0100 or TYT-0200

b. SPI Node

c. PIP Node

d. C-11A recorders

DISTRACTOR ANALYSIS

a. This is a TYPE of temperature indication, but it is NOT CET related.
b. SPI does interface with the PPC, but not for the stated function.
c. PIP does interface with the PPC, but not for the stated function.
d. **CORRECT - A valid alternate method of determining CET readings.**

Cognitive Level: LOW
Recall specific facts. Candidate must recall inputs and outputs and resulting indications available for incore temperature monitoring.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:35

K/A: 022 Containment Cooling K2.01
Knowledge of power supplies to the containment cooling fans.

Tier 2 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: List the power supplies for the following Containment Cooling System Components Containment Cooling Fans V-1A/B, 2A/B, 3A/B, 4A/B (CAIR_CK07.0)

References: P& ID E-1, sh. 1, Rev BS

Question:
Which Containment Air Cooler (CAC) fans have power available if D/G 1-2 is the ONLY available source of AC power?

a. V-1A, V-2A, and V-3A

b. V-4A only

c. ALL CAC "A" fans

d. ALL CAC "A" and "B" fans

DISTRACTOR ANALYSIS

a. **CORRECT - Right channel equipment powered from right channel EDG.**
b. This is the incorrect channel component for the stated conditions.
c. Incorrect recall of power supplies.
d. Incorrect recall of power supplies, and fan response.

Cognitive Level: LOW
Recall specific facts. Candidate is required to recall which fans are powered from right channel safety related power.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:36

K/A: 056 Condensate K1.03
Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and MFW.

Tier: 2 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** 2
Group: 1 **SRO Imp:** 2.6 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Predict how the following conditions will impact operation of the Main Condenser, Condensate and Feedwater system: EK-0155 "CONDENSATE PUMP TRIP" (CDFW_CK13.0)

References: ARP-1, window 55 and 60, rev 52 ONP-3, 1.0, 2.0, rev 18

Question:
The plant is operating at 100% power when BOTH Condensate Pumps P-2A and P-2B unexpectedly trip.

What is the resulting effect on the Main Feedwater (MFW) Pumps?

a. They trip due to a reduction in MFW pump suction pressure.

b. They trip due to overspeeding of the MFW pump turbines.

c. MFW pumps will experience excessive vibration due to cavitation at the pump suction.

d. MFW pump turbines ramp down to minimum speed to prevent overfeeding Steam Generators.

DISTRACTOR ANALYSIS

a. **CORRECT - At full power, even one condensate pump tripping would cause such a severe reduction in MFW Pump suction pressure, that a both MFW pps would trip on low suction.**
b. Correctly believes feed pumps trip, but for wrong reason.
c. The protective low suction pressure trip actuates long before any cavitation would develop.
d. There is a certain plant condition that causes MFW pumps to ramp down in speed, but it is incorrectly applied here.

Cognitive Level: HIGH 2
How systems interact; describing consequences. Candidate is given conditions involving the relationship between the Condensate System and the Main Feedwater System and then required to recognize the expected interaction (result).

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:37

K/A: 059 Main Feedwater K1.04
Knowledge of the physical connections and/or cause-effect relationships between the MFW and S/GS water level control system.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Identify redundant Control Room indications that can be used to validate the following Control Room alarms: EK-0961, EK-0963, "STEAM GEN E-50A (E-50B) HI LEVEL" (SGWL_CK14.0)

References: ARP-5, window 61, rev 65

Question:
The plant is operating at 60% power with the Steam Generator Level Control System in automatic, when Annunciator EK-0961, "STEAM GEN E-50A HI LEVEL" alarms.

Which one of the following sets of indications would be expected for the above plant conditions?

	CV-0701 position indicator POI-0701	Steam Generator Level
a.	Lowering	55%
b.	Rising	85%
c.	Rising	55%
d.	Lowering	85%

DISTRACTOR ANALYSIS

a. Correct response, but incorrect setpoint.
b. Incorrect response, but correct setpoint.
c. Incorrect response, and incorrect setpoint.
d. **CORRECT - Valve controller output lowers due to a signal from Hi Level Override circuit.**

Cognitive Level: LOW
Recognition of setpoints, recall of specific facts. Candidate is provided an alarm condition and required to recall a setpoint which causes an effect on the steam generator water level control system.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number:38

K/A: 061 Auxiliary/Emergency Feedwater K4.12
Knowledge of the AFW design feature(s) and/or interlock(s) which provide for natural circulation flow.

Tier: 2 **RO Imp:** 3.5 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Explain the Auxiliary Feedwater system component design features and/or interlocks that provide the following functions: Minimum flow rate for decay heat removal.(AFW_CK09.0)

References: DBD 1.03, page 50 of 124 P&ID (Logic Diagram) E-17, sh. 21, 21A

Question:
Given the following conditions:

- From full power a transient occurs that results in a valid Aux. Feedwater Actuation Signal (AFAS).
- P-8A Aux. Feed Pump is tagged out.
- Plant conditions also require a Natural Circulation plant cooldown.
- P-8C AFW Pump is the ONLY AFW Pp. operating.
- AFW flow to "A" S/G = 80 gpm and stable.
- AFW flow to "B" S/G = 120 gpm and stable.

Which one of the following describes AFW System response in establishing and maintaining a natural circulation cooldown?

a. acceptable since Auxiliary Feedwater flow to at least ONE S/G is greater than 100 gpm.

b. acceptable since Auxiliary Feedwater flow to BOTH S/Gs is greater than 70 gpm.

c. NOT acceptable since P-8B turbine driven pump should have auto started due to flow to ONE S/G at less than 100 gpm.

d. NOT acceptable since P-8B turbine driven pump should have auto started due to flow to BOTH S/Gs at less than 165 gpm.

DISTRACTOR ANALYSIS

a. **CORRECT - Per logic diagram starting sequence, flow to at least one S/G at least 100 gpm precludes auto starting of any additional pumps.**
b. Correct assessment, but incorrect flow rate.
c. Incorrect assessment, and incorrect response.
d. Incorrect assessment, and incorrect response.

Cognitive Level: LOW
Recall specific facts; setpoints. This question does have some apparent elements of a higher cognitive level question, but it actually requires the candidate to recall a setpoint for automatic starting of an additional auxiliary feedwater pump.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number:39

K/A: 068 Liquid Radwaste K1.02
Knowledge of the physical connections and/or cause effect relationships between the Liquid Radwaste System and the waste gas vent header.

Tier: 2 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** 2.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Given the P&IDs, describe the normal flow path for venting the containment via the Clean Waste Receiver Tanks (PVT_E03.01)

References: SOP-24, 7.2.2, rev 36

Question:
Containment is normally vented to the ____(1)____ via the _____(2)_____.

	(1)	(2)
a.	Waste Gas Collection Hdr	Shield Cooling Surge Tank
b.	Main Exhaust Plenum	Waste Gas Surge Tank
c.	Waste Gas Surge Tank	T-64A Clean Waste Receiver Tank
d.	Vent Gas Collection Header	T-64D Clean Waste Receiver Tank

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DISTRACTOR ANALYSIS

a. Incorrectly applies function of radwaste equipment.
b. Incorrectly applies function of ventilation and radwaste equipment.
c. One component in the path is incorrect.
d. **CORRECT - The rupture disk on T-64D is permanently removed and is used as the normal means of venting containment.**

Cognitive Level: LOW
Recall of specific facts. Requires candidate to recall details of physical connections in the context of venting containment.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 40

K/A: 071 Waste Gas Disposal K5.04
Knowledge of the operational implication of the relationship of hydrogen/oxygen concentrations to flammability as it applies to the Waste Gas Disposal System.

Tier: 2 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.5 / 45.7

Palisades Training Objective: Describe the consequences of not maintaining Waste Gas Surge Tank pressure in accordance with SOP-2A. (ISEE_E01.01)

References: SOP-18A, Source Documents section, rev 33; FSAR 11.3

Question:
Flammable gas mixtures are prevented in the Waste Gas Decay Tanks by ...

a. venting Volume Control Tank hydrogen if Waste Gas Decay Tanks oxygen exceeds 5%.

b. maintaining the Waste Gas Surge Tank at a slightly positive pressure.

c. maintaining the Vacuum Degasifier Tank with a nitrogen overpressure when in standby.

d. placing the Vacuum Degasifier Tank in service during all resin sluices.

DISTRACTOR ANALYSIS

a. Candidate is correct in recalling a limit on oxygen for the decay tanks, but incorrectly applies it through faulty system knowledge.
b. **CORRECT - In Palisades' early history, air would get sucked in to the Waste Gas Surge Tank through flanges,etc. Maintaining this tank at a slightly positive pressure prevents air from ending up in the Waste Gas Decay Tanks which potentially have hydrogen in them (from VCT).**
c. Incorrect application of system knowledge. There is no nitrogen overpressure used in VDT.
d. Good discriminatory value since resin sluices are performed, but VDT is not used.

Cognitive Level: LOW
Knowledge of procedural steps and cautions. To answer this question requires the candidate to recall a specific fact regarding procedural guidance.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 41

K/A: 072 Area Radiation Monitoring K1.03
Knowledge of the physical connections and/or cause-effect relationships between the ARM system and fuel building isolation.

Tier: 2 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Describe the design features and interlocks that provide the following Radiation Monitoring System functions: Fuel Handling Area Vent Isolation (RMS_CK09.0)

References: SOP-39, 4.0.b, and 7.3.2.b, rev 11

Question:
Placing the Fuel Handling Area Monitors RIA-2316 and RIA-2317 cutout switches to the **IN** position will:

a. Enable automatic closure of selected Containment Isolation valves.

b. Trip the Fuel Handling Area Supply Fan V-7 on one out of two logic.

c. Enable automatic closure of Fuel Handling Area exhaust dampers.

d. Trip the Penetration and Fan Room V-78 and V-79 on high radiation.

DISTRACTOR ANALYSIS

a. **CORRECT - Not all containment isolation valves are affected by these monitors; only the ones associated with the fuel handling area.**
b. Good discriminatory value since the mention of a logic seems to match with the number of monitors, and this fan is associated with fuel handling area, however, this fan is not affected.
c. Candidate correctly believes there would be an automatic action on high rad, but these exhaust dampers do not actuate for given conditions.
d. Listed fans do not trip for given conditions, but good discriminatory value since these fans are associated with containment penetrations.

Cognitive Level: LOW
Recall of specific facts. Requires the candidate to recall certain design features of the ARM system and the effect on another system.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 42

K/A: 006 Emergency Core Cooling G 2.1.33
Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.2 / 43.3 / 45.3

Palisades Training Objective: Given a directive perform Safety Injection Tank Sampling/Boron Concentration Adjustment in accordance with SOP-3. (SIS_T03.00)

References: T.S. 3.5.1

Question:
Given the following:

The Plant is in MODE 3. Safety Injection Tank parameters are as follows:

SIT	PRESSURE	BORON (PPM)
T-82A	205	1750
T-82B	215	1920
T-82C	225	1705
T-82D	220	2150

Which ONE of the Safety Injection Tanks (SITs) will prevent entry into MODE 2 per Technical Specifications?

a. T-82A

b. T-82B

c. T-82C

d. T-82D

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes pressure is too low, but boron is acceptable.
b. Candidate correctly believes pressure is acceptable, but boron is too high.
c. **CORRECT - Limit is >200 psig, and between 1720 and 2500 ppm.**
d. Candidate believes pressure and boron are too high.

Cognitive Level: LOW
Knowledge of procedural steps and cautions; setpoints. Candidate must recognize an abnormal operating parameter and recall that this requires entry into a Technical Specification.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 43

K/A: 010 Pressurizer Pressure Control K1.02
Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and ESFAS.

Tier: 2 **RO Imp:** 3.9 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Explain the purpose and function of interfaces (physical connections) between the Pressurizer Pressure Control System and the following plant systems: ESFAS (PPCS_CK06.0)

References: ONP-18, 1.0.a, 2.0, 4.2.1.c.1, rev 16; ARP-4, window 53, rev 56; ARP-21, C-1, rev 48

Question:
The plant is operating at 65% power when both pressurizer spray valves fail OPEN. With NO operator action, which of the following automatic actuations is expected to occur?

a. Safety Injection and then a Reactor trip.

b. Reactor trip and then a Safety Injection.

c. ONLY a Reactor trip.

d. ONLY a Safety Injection.

DISTRACTOR ANALYSIS

a. Candidate misapplies reactor trip setpoint for Thermal Margin/Low Pressure RPS trip.
b. **CORRECT -The reactor will trip at a higher pressure than SIAS occurs.**
c. Correct in believing the reactor trips, but fails to recognize an ESFAS setpoint.
d. Candidate recognizes ESFAS setpoint, but fails to recognize reactor trip setpoint.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate must apply knowledge of spray valve operation and cause-effect relationship to predict an automatic safety actuation.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 44

K/A: 011 Pressurizer Level Control K6.03
Knowledge of the effect of a loss or malfunction on the following will have on the PZR LCS: Relationship between PZR level and PZR heater control circuit.

Tier: 2 **RO Imp:** 2.9 **RO Exam:** Yes **Difficulty:** 2
Group: 2 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 /45.7

Palisades Training Objective: Describe the design features and interlocks that provide the following Pressurizer Pressure Control system functions: Automatic protective de-energization of Pressurizer heaters (PPCS_CK09.0)

References: ARP-4, windows 63, 64, rev 56

Question:
Given the following plant conditions:

- During a small break LOCA Pressurizer level begins slowly lowering.
- Pressurizer level drops to 34% before the operator notices the trend.

Which of the following describes the status of the Pressurizer heaters?

a. ONLY the proportional heaters are energized.

b. ONLY the backup heaters are energized.

c. ALL heaters are energized.

d. NO heaters are energized.

NOTE: RO 4 is similar, but not considered a duplication. RO4 tests knowledge of lowering PZR level upon loss of charging and letdown.

DISTRACTOR ANALYSIS

a. Candidate misapplies system knowledge by thinking that proportional heaters have different setpoint.
b. Candidate misapplies system knowledge by thinking that backup heaters have different setpoint.
c. Heaters trip at 36% level for heater protection.
d. **CORRECT - Heaters trip at 36% for heater protection.**

Cognitive Level: HIGH 2
Recognize consequences or implications. Candidate must apply knowledge of the relationship between the Pressurizer and its heater control circuits to determine the consequences of the given condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 45

K/A: 014 Rod Position Indication A1.01
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including metroscope reed switch display.

Tier: 2 **RO Imp:** 2.9 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45.5

Palisades Training Objective: Describe the operational design of each of the following Control Rod Drive System major components: Primary Position Indication, Secondary Position Indication in accordance with the FSAR. (CRD_E02.02)

References: DBD 2.06, 3.3.4.1, rev 3

Question:
Which one of the following describes the use of the PIP (Primary Indication Panel) indication as compared to the SPI (Secondary Position Indication) indication when monitoring control rod positions?

a. PIP is a MORE accurate indication since it receives input from the synchro-transmitters.

b. PIP is a LESS accurate indication since it receives input from the reed stack switches.

c. SPI is a LESS accurate indication since it receives input from the synchro-transmitters.

d. SPI is a MORE accurate indication since it receives input from the reed stack switches.

DISTRACTOR ANALYSIS

a. **CORRECT - The resolution of the synchro transmitters is much more accurate (± 0.5") than the reed stack switches (± 1.5").**
b. Candidate incorrectly recalls input to PIP and that it is less accurate.
c. Candidate incorrectly recalls input to SPI, but assessment of accuracy is correct.
d. Candidate correctly recalls SPI input, but is incorrect in the assessment of accuracy.

Cognitive Level: LOW
Recall of specific facts. The K/A calls for a "prediction" OR "monitor". This question is of the lower cognitive level since it is testing the "monitor" aspect of the K/A. Candidate is required to recall a specific attribute (fact) associated with the Rod Position Indication System.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 46

K/A: 026 Containment Spray K4.08
Knowledge of CSS design feature(s) and/or interlock(s) which provide for automatic swapover to containment sump suction for recirculation phase after LOCA (RWST low-low level alarm).

Tier: 2 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** **3**
Group: 2 **SRO Imp:** 4.3 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution or warning in accordance with the Emergency Operating Procedure Bases Document. (TBAG_TBCORE_CK.02

References: EOP Supp 42 Basis

Question:
The following plant conditions exist:

* SIRW tank level indicates 23% and is lowering.
* Pre RAS alignment verification is being performed per EOP Supplement 42 "Pre and Post RAS Actions"
* Only ONE Containment Spray Pump is available and is operating.
* Actions were taken per EOP Supplement 42 to secure one HPSI pump and to CLOSE the Containment Spray Header isolation valve CV-3001.

These actions were taken to ensure that when the Recirculation Actuation signal (RAS) does occur...

a. the operating Containment Spray Pump will not be in a runout condition.

b. the operating HPSI pump will not be above its design discharge pressure rating.

c. the operating Containment Spray Pump will not be above its design discharge pressure rating.

d. the operating HPSI pump will not be in a runout condition.

DISTRACTOR ANALYSIS

a. **CORRECT - When RAS occurs, containment spray continues, but now another load is placed on the spray pump (subcooling flow to any operating HPSI pumps). One containment spray pump is not capable of providing spray to both headers and subcooling to both HPSIs.**
b. Candidate selects in incorrect equipment, and the incorrect operational concern.
c. Candidate selects the correct equipment, but selects the incorrect operational concern.
d. Candidate selects the correct operational concern, but for the wrong pump.

Cognitive Level: LOW
Knowledge of procedural steps and cautions. The exam author acknowledges that there are elements of both LOW and HIGH cognitive levels in this question. LOW - candidate is required to recall the procedural caution for the given conditions. HIGH - candidate could use knowledge of system design and operation, and applying higher cognitive level thinking arrive at the correct answer. The conservative assignment of a lower cognitive level was applied for this particular question, based on exam author judgement.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 47

K/A: 033 Spent Fuel Pool Cooling K1.05
Knowledge of the physical connections and/or cause-effect relationships between the Spent Fuel Pool Cooling System and the RWST.

Tier: 2 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 2.8 **SRO Exam:** Yes **Source:** **Bank SIG MOD**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Explain the purpose of the interfaces (physical Connections) between the Spent Fuel Pool Cooling System and other plant systems in accordance with the P&IDs and FSAR. (SFP_CK06.0)

References: SOP-27 P&ID M-221, sh.2

Question:
Refer to attached drawing.
When transferring water from the Spent Fuel Pool (SFP) to the SIRW Tank using only P-82, Spent Fuel Pool Recirc Booster Pump, MV-SFP113 (T-50 to the SFP) is closed and MV-SFP127 (T-50 to the SIRW Tank) is opened.

When restoring the Spent Fuel Pool Cooling System to its normal lineup and P-82 is shut off, what concern is addressed by closing MV-SFP127 PRIOR to re-opening MV-SFP113?

a. SFP overfill due to backflow from the SIRW tank.

b. SFP low level due to siphoning action.

c. A high level in the SIRW tank due to unplanned transfer from SFP.

d. Elevated temperature of SIRW tank water due to unplanned transfer from SFP.

DISTRACTOR ANALYSIS

a. **CORRECT - The top of the SFP is at a lower elevation than the surface of water in the SIRW tank. This event actually occurred at Palisades in the early 80s, and a large amount of SFP water overflowed down the stairwell and into the Aux. Bldg. The specified valve operation now prevents this from happening.**
b. The real concern is a high level in the SFP.
c. The design of the SFP incorporates a siphon breaker to preclude this concern.
d. A high temperature in SIRW tank *would* be a concern, except the transfer direction for these conditions is FROM the SIRW tank.

Cognitive Level: HIGH 2
Recognize relationships; how systems interact; consequences or implications. Candidate is required to apply knowledge of various parts of the SFP cooling system and the SIRW tank and determine the implications for the given conditions.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: M-221, sh.2

Question Number: 48

K/A: 035 Steam Generator A2.01
Ability to (a) predict the impacts of the faulted or ruptured SGs on the SG; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of the faulted or ruptured SGs.

Tier: 2 **RO Imp:** 4.5 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** 4.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.5

Palisades Training Objective: Given an Off Normal event and Control Room references, evaluate plant response to the event and determine if a plant shutdown should be commenced. (IOTF1_CK16.0)

References: Provide ONP-23.2 (excerpt)

Question:
Given the following plant conditions:

- Plant is at 80% power and was performing a power escalation to full power when EK-1364, "GASEOUS MONITORING HI RADIATION" annunciated.
- It is determined that this alarm is due to RIA-0631, Condenser Off-Gas Monitor in an alarm condition.
- PCS total gas activity is 0.18 µCi/cc.
- Off Gas flow is 2 cfm
- At 0610 RIA-0631 indicated 1.00 E4 cpm
- At 0710 RIA-0631 indicates 2.00 E4 cpm
- "B" Steam Generator is the affected generator.

What actions should be taken to address the above plant conditions?

a. Trip the reactor and carry out the Immediate Actions of EOP-1.0, "Standard Post-Trip Actions"

b. Plant management must evaluate the need to perform a controlled Plant shutdown per GOP-8, "Power Reduction and Plant Shutdown".

c. Place the Plant in Mode 3 within 24 hours per ONP-23.2, "Steam Generator Tube Leak", Step 4.2.

d. Place the Plant in Mode 3 within 4 hours per ONP-23.2, "Steam Generator Tube Leak", Step 4.2.

DISTRACTOR ANALYSIS

a. Candidate misinterprets/miscalculates and arrives at an incorrect leak rate, or misuses the decision table based on rate of rise of leak rate.
b. Candidate misinterprets/miscalculates and arrives at an incorrect leak rate, or misuses the decision table based on rate of rise of leak rate.
c. Candidate misinterprets/miscalculates and arrives at an incorrect leak rate, or misuses the decision table based on rate of rise of leak rate.
d. **CORRECT - Tube leak rate at 0610 = 0.0361 gpm. Tube leak rate at 0710 = 0.0833 gpm. This indicates a rate of rise of 0.047 gpm / hr which requires a plant shutdown within 4 hours.**

Cognitive Level: HIGH 3
Solve a problem; predict an outcome. Candidate is required to evaluate the given conditions, use a relatively complex procedure curve to determine an exact parameter (leak rate), and then determine the action for mitigating the event.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: ONP-23.2 (excerpt)

WRITTEN QUESTION DATA SHEET

Question Number: 49

K/A: 055 Condenser Air Removal K1.06
Knowledge of the physical connections and/or cause-effect relationships between the CARS and the PRM system.

Tier: 2 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 2.6 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.2 to 41.9 / 45.7 to 45.8

Palisades Training Objective: Identify the differences in radiation monitor response to a S/G tube leak as a result of a change in any of the following parameters Process flow rate (e.g. blowdown flow rate or offgas flow rate) (IOTF2_EO12.05)

References: ONP-23.2 SOER-93-1, Supplement KLO 9

Question:
For the same size Steam Generator tube leak, which of the following describes the relationship between RIA-0631, Off-Gas Monitor indication and the Off Gas flow rate from the Main Condenser?

a. At high Off Gas flow rates, RIA-0631 will indicate LOWER than it would for low Off Gas flow rates.

b. At high Off Gas flow rates, RIA-0631 will indicate HIGHER than it would for low Off Gas flow rates.

c. RIA-0631 cannot provide reliable indication of activity at high Off Gas flow rates.

d. RIA-0631 cannot provide reliable indication of activity at low Off Gas flow rates.

DISTRACTOR ANALYSIS

a. **CORRECT - The high flow rate dilutes the reading.**
b. Misapplies the relationship between flow and dilution of reading.
c. Good discriminatory value since candidate believes the monitor is overranged due to high flow rate.
d. Good discriminatory value since candidate believes the monitor fails to detect at low flow rate.

Cognitive Level: HIGH 2
Recognize how systems interact; knowledge of implications. Candidate must apply knowledge of the relationship between the condenser air removal system, flow rate, and the off-gas radiation monitoring system.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 50

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 components using DC control power.

Tier: 2 **RO Imp:** 3.5 **RO Exam:** Yes **Difficulty:** 2
Group: 2 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **Bank Direct (2000 NRC C67)**

Applicable 10CFR55 Section: 41.7 / 45.6

Palisades Training Objective: Given various plant conditions, control room references and a loss of a DC bus, determine the effect of the loss on plant systems and components. (IOTF1_E13.01)

References: ONP-2.3, Att. 1, rev 12 (provide this reference)

Question:
Given the following conditions and the provided references, as needed:

- Battery Chargers #1 and #2 are in service.
- Battery Charger #3 is inoperable and is to be tagged out.

The following sequence of events occur:
- Breaker 52-285 (Station Battery Charger #3) is opened.
- Breaker 72-15 (Charger #1) is mistakenly opened.

Which of the following additional breaker trips will result in a reactor trip?

a. 72-10

b. 72-18

c. 72-36

d. 72-37

DISTRACTOR ANALYSIS

a. Candidate misinterprets function of tie breaker 72-10 for these given conditions.
b. **CORRECT - Opening this breaker isolates the only remaining source of power (batteries).**
c. Candidate incorrectly believes losing power to one Preferred AC Bus causes a reactor trip.
d. Candidate incorrectly believes losing power to one Preferred AC Bus causes a reactor trip.

Cognitive Level: HIGH 2
Recognizing relationships, how systems interact, and knowledge of consequences. Candidate must use system level knowledge and understand the layout of the DC System (drawing), and then determine a failure which will have the consequences given in the question stem.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: ONP-2.3, Att. 1

Question Number: 51

K/A: 064 Emergency Diesel Generator K3.03
Knowledge of the effect that a loss or malfunction of the ED/G system will have on ED/G (manual loads).

Tier: 2 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.6

Palisades Training Objective: For the following Emergency Diesel Generator system major components, NSD/DBA Sequencers
describe the operational design of each component, and describe the normal operating range of the component. (EDG_CK02.0)

References: DBD 5.05, Drawing E-17, sh. 4

Question:
Following a Loss of Coolant Accident, the reactor was tripped and Safety Injection initiated.

- 2400 VAC Bus 1D is being powered by the Safeguards Transformer.
- 2400 VAC Bus 1C has had a load shed.
- EDG 1-1 is running with normal voltage.
- Breaker 152-107, EDG 1-1 output breaker will NOT close.

What is the resulting effect on the DBA load sequencers?

a. Left channel DBA sequencer IS operating, right channel DBA sequencer IS operating.

b. Left channel DBA sequencer is NOT operating, right channel DBA sequencer IS operating.

c. Left channel DBA sequencer IS operating, right channel DBA sequencer is NOT operating.

d. Left channel DBA sequencer IS NOT operating, right channel DBA sequencer IS NOT operating.

DISTRACTOR ANALYSIS

a. Candidate is correct in recalling that load shed is a permissive for sequencer operation, but mistakenly believes that the D/G output breaker does not have to be closed.
b. Candidate has transposed left and right channel sequencers for the given conditions.
c. Candidate is correct in recalling that load shed is a permissive for sequencer operation, but mistakenly believes that the D/G output breaker does not have to be closed.
d. **CORRECT - Permissives for DBA sequencer are not met for either channel.**

Cognitive Level: HIGH 3
Integrating information bits and relationships to predict an outcome. Candidate is given a set of conditions related to the diesel generators and required to apply system knowledge and integrational cognitive ability to predict the outcome.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 52

K/A: 073 Process Radiation Monitoring G 2.1.32
Ability to explain and apply all system limits and precautions.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 3.8 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.2 / 45.12

Palisades Training Objective: Identify redundant Control Room indications that can be used to validate the following Control Room Alarms: EK-1371, "RADIATION SYSTEM CKT FAILURE" (RMS_CK14.0)

References: SOP-37, 4.0.c, rev 15

Question:
Many Process Liquid Monitors have a HIGH alarm and a LOW alarm setpoint. SOP-37, "Process Liquid Monitor System" Plant Requirements prescribes how these alarm setpoints are to be set.

Which one of the following explains how the LOW level alarm setpoints are to be set?

a. Below background so as to act as a circuit failure alarm for the monitor.

b. Above background so as to act as a circuit failure alarm for the monitor.

c. As specified in the Offsite Dose Calculation Manual.

d. As specified in the Operating Requirements Manual.

DISTRACTOR ANALYSIS

a. **CORRECT - Per given reference, this is the correct method and reason for it.**
b. Candidate misapplies the direction of circuit failure response.
c. Candidate mistakenly believes that ODCM contains these directions.
d. Candidate incorrectly recalls function of the ORM.

Cognitive Level: HIGH 2
Rephrasing information; recognize consequences or implications. If this question only tested the first part of the K/A, "explain" then this question may need to be written at a lower cognitive level. However, since the candidate BOTH "explains" and "applies" the listed precaution by recognizing a condition where it applies, and the expected result (alarm), it must be written at the HIGHER 2 level.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 53

K/A: 075 Circulating Water K2.03
Knowledge of bus power supplies to the emergency/essential SWS pumps.

Tier: 2 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** **2**
Group: 2 **SRO Imp:** 2.7 **SRO Exam:** Yes **Source:** **Bank Direct (2001 NRC S12)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: List the power supplies for the Service Water Pumps P-7 A/B/C. (ISDA_CK07.0)

References: P&ID E-1, sh. 1, rev BS

Question:
Which of the following describes the power supplies for the Service Water Pumps?

	P-7A	P-7B	P-7C
a.	Bus 1D	Bus 1D	Bus 1C
b.	Bus 1D	Bus 1C	Bus 1D
c.	Bus 1C	Bus 1C	Bus 1D
d.	Bus 1C	Bus 1D	Bus 1C

DISTRACTOR ANALYSIS

a. Candidate has selected an incorrect channel separation scheme of the safety buses.
b. **CORRECT - Per electrical print.**
c. Candidate has selected an incorrect channel separtaion scheme of the safety buses.
d. Candidate is correct in that P-7A and P-7C are powered from the same bus, but it is the incorrect bus.

Cognitive Level: LOW
Recall specific facts. Candidate is required to recall power supplies for Service Water Pumps.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 54

K/A: 079 Station Air A2.01
Ability to (a) predict the impacts of cross-connection with IAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of cross-connection with IAS.

Tier: 2 **RO Imp:** 2.9 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** 3.2 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.13

Palisades Training Objective: Given Off Normal plant conditions, describe the mitigating strategy as it relates to the Operator actions contained in the applicable Off Normal Procedure. (IOTF_CK07.0)

References: EOP Supplement 25 ONP-7.1

Question:
Given the following conditions:

- The actions of ONP-7.1, "Loss of Instrument Air" have been implemented.
- Instrument air is being provided from Feedwater Purity Air system, using C-903A air compressor. System header pressure is being maintained at the normal pressure.
- Subsequently, a Large Break LOCA inside containment occurs, with all equipment responding per design.

What is the impact , if any, of the air system cross connection for the current plant conditions, and what action, if any, is required?

a. Since C-903A is now operating with reduced cooling flow and elevated temperatures, an Auxiliary Operator must locally raise cooling flow per SOP-19, "Instrument Air System".

b. C-903A continues to operate normally and provide plant instrument air header pressure, and no additional action is required.

c. Since C-903A has tripped due to loss of power; operators will have to implement an EOP Supplement for repowering and restarting C-903A.

d. C-903A is running, but must be manually tripped since it has NO cooling water. Operators will have to align High Pressure Air System to supply the Instrument Air System.

DISTRACTOR ANALYSIS

a. Candidate correctly thinks that the Safety Injection has isolated non-critical service water cooling to C-903A, but neglects to realize that the Safety Injection also deenergizes the bus supplying C-903.
b. Candidate fails to realize that Safety Injection has deenergized the bus powering C-903A.
c. **CORRECT - Bus 1E is the ultimate supply for C-903A. Bus 1E deenergizes on SIAS.**
d. Candidate correctly thinks that the Safety Injection has isolated non-critical service water cooling to C-903A, but neglects to realize that the Safety Injection also deenergizes the bus supplying C-903.

Cognitive Level: HIGH 3
Predict an outcome; solve a problem. Candidate must evaluate given conditions, apply system knowledge, and predict the impact on the given operation (cross connection); and further, must solve this problem by determining an appropriate remedial action.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 55

K/A: 007 Pressurizer Relief/Quench Tank K5.02
Knowledge of the operational implications of the method of forming a steam bubble in the PZR as it applies to PRTS.

Tier: 2 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** 4
Group: 3 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **Bank Direct (2001 NRC R54)**

Applicable 10CFR55 Section: 41.5 / 41.7

Palisades Training Objective: Given solid plant conditions, establish a stream bubble in the Pressurizer in accordance with SOP-1 and SOP-2A. (IOTA_T04.00)

References: SOP-1, 4.5.3, rev 51

Question:
The plant is in a heatup from MODE 4 to MODE 3 and drawing a bubble in the Pressurizer. What is the pressure requirement for the Quench Tank?

a. less than 10 psig.

b . greater than 10 psig.

c. less than 25 psig.

d. greater than 25 psig.

DISTRACTOR ANALYSIS

a. **CORRECT - Correct specification per the procedure. A maximum pressure limit (as opposed to a minimum) ensures the Quench Tank can receive PORV or safety discharge if actuated during drawing a bubble.**
b. Candidate selects the correct numerical value, but misapplies the concern for a pressure limit.
c. Candidate correctly believes there is a maximum limit, but selects the incorrect numerical value.
d. Candidate selects the incorrect numerical value, and misapplies the concern for a pressure limit.

Cognitive Level: LOW
Recall specific facts; procedural steps and cautions. Candidate is required to remember a specific procedural caution for the given evolution.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 56

K/A: 008 Component Cooling Water G 2.1.32
Ability to explain and apply all system limits and precautions.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **2**
Group: 3 **SRO Imp:** 3.8 **SRO Exam:** Yes **Source:** **Bank (Significantly modified)**

Applicable 10CFR55 Section: 41.10 / 43.2 / 45.12

Palisades Training Objective: Describe the consequences of operating the Component Cooling Water System under the following conditions: (CCW_CK16.0)
When stroking open, Shutdown Cooling Heat Exchanger Component Cooling Water Inlet Valves (CV-0937 and CV-0938), not ensure a minimum of two CCW pumps are in-service.

References: SOP-16, 5.1.3, rev 23

Question:
SOP-16, "Component Cooling Water System" contains a precaution that relates to operation of the following valves:
* CV-0937 and CV-0938, Shutdown Cooling Heat Exchanger CCW Inlet Valves.

Which one of the following describes the applicability of this precaution (including the concern it addresses), AND the action required to satisfy the precaution?

a. If only ONE CCW pump is operating, manually start a second CCW pump. This action prevents auto starting of the STANDBY CCW pump and is done prior to OPENING the valves.

b. If only ONE Service Water pump is operating, manually start a second Service Water pump. This action prevents auto starting of the STANDBY Service Water pump and is done prior to OPENING the valves.

c. If more than one CCW pump is operating, shut off one CCW pump prior to CLOSING the valves. This action ensures the valves operate smoothly, due to lowered system flow.

d. If more than Service Water pump is operating, shut off one Service Water pump prior to CLOSING the valves. This action prevents overcooling of the CCW System, since Service Water system flow has been reduced.

DISTRACTOR ANALYSIS

a. **CORRECT - Auto starting of standby pump is not desired. Valves are in the CCW system and will significantly lower system pressure when opened, likely low enough to auto start STANDBY pp.**
b. Candidate incorrectly believes any additional heat load on the SW system causes SW pressure to lower enough to start the standby SW pump; but in reality there is no significant head load from SDC at this point in the evolution.
c. Candidate incorrectly believes valves have an unusual sensitivity to system flow rates.
d. The transition of going off of shutdown cooling is much smoother than what candidate believes here.

Cognitive Level: HIGH 2
Knowledge of implications; how systems interact. Candidate is required to apply system operational knowledge and determine the implications of the given conditions in the context of a procedural precaution.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 57

K/A: 027 Containment Iodine Removal K5.01
Knowledge of the operational implications of the purpose of charcoal filters as it applies to the CIRS.

Tier: 2 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** **2**
Group: 3 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: For the following Containment Cooling System major components:I odine Removal Fans V-940 A/B
Describe the operational design of each component
Describe the normal operating range of each component (CAIR_CK02.

References: GOP-8, 2.6.a, rev 19 GOP-5, 1.2, rev 28 SOP-24, 7.2.7, rev 36
FSAR 9.8, page 9.8-13, rev 23

Question:
Which one of the following describes the operation of the containment Iodine Removal Fan units (V-940A, V-940B) and associated charcoal filters?

a. Automatically start on a Safety Injection Signal (SIS) to remove I-131 generated during a Loss of Coolant Accident (LOCA).

b. Manually started during a normal Plant shutdown to remove I-131 for containment habitability.

c. Manually started during a normal Plant startup to minimize potential I-131 release to the environment.

d. Automatically start on a Containment High Pressure (CHP) to assist Containment Spray System in removing I-131 from containment.

DISTRACTOR ANALYSIS

a. Candidate correctly expresses a concern for I-131; however, for the conditions given (LOCA) iodine removal is via the TSP baskets; further, there is no automatic start feature for this equipment.
b. **CORRECT - These fans are manually operated (no auto start feature) and for reducing iodine in the containment atmosphere prior to an outage.**
c. These fans are not used for plant startup; candidate incorrectly believes a release to the environment is the design function of the fans.
d. There is no automatic start feature for the fans.

Cognitive Level: LOW
Recall specific facts. Candidate must recall the function and operational implications (i.e., when are they used) of the charcoal filters for containment iodine removal.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 58

K/A: 028 Hydrogen Recombiner and Purge Control A2.03
[Ability to (a) predict the impacts of the hydrogen air concentration in excess of limit flame propagation or detonation with resulting equipment damage in containment]; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **2**
Group: 3 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.13

Palisades Training Objective: Given post-accident containment conditions, determine the containment hydrogen concentration at which, the Hydrogen Recombiners should be placed in service in accordance with the 'In-use' EOP. (CH2_E01.05)

References: EOP-4.0, step 58 and basis

Question:
Given the following plant conditions:

- From full power, a Large Break LOCA occurred.
- Containment hydrogen concentration is at 3%.

Which one of the following actions should be taken to minimize the potential for a hydrogen burn and subsequent containment pressure spike?

a. Re-start all Containment Air Cooling "B" fans.

b. Initiate a containment purge to reduce hydrogen below 1%.

c. Operate at least one Hydrogen Recombiner.

d. Energize Motor Control Center 9 by closing breaker 52-1304.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that additional containment air circulation may somehow dilute any hydrogen, and further, restarting the "B" fans defeats the design function of auto tripping for an SIS.
b. Purging containment may or may not reduce hydrogen concentration; in any case, a containment purge would NOT be initiated for the given plant conditions.
c. **CORRECT - A recombiner functions to reduce hydrogen, and is placed in service when hydrogen is between 1% and 3% concentration.**
d. Candidate incorrectly believes this energizes equipment for hydrogen reduction; however, the procedure actually prescribes DEenergizing this MCC.

Cognitive Level: HIGH 2
Knowledge of implications, rephrasing information. Candidate must first determine the implications or impacts of the given hydrogen concentration during the LOCA. Must then relate that determination to the need for an action.

K/A Match Assessment: **ADEQUATE**

References Supplied to Candidate: **None**

Question Number: 59

K/A: 034 Fuel Handling Equipment A3.02
Ability to monitor automatic operation of the Fuel Handling System, including load limits.

Tier: 2 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 4
Group: 3 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5
Palisades Training Objective: Given fuel movement conditions in the Spent Fuel Pool/Reactor Cavity, describe the Spent Fuel Handling Machine/Refueling Machine interlocks that prevent the following IAW SOP 28 and/or Westinghouse Refueling Procedures: (IOTDK.01)
Dropping of a fuel assembly Damage to a fuel assembly due to binding

References: SOP-28, Att. 7, Section 8.0, rev 33 FSAR 9.11-20, rev. 23 SOP-28, Note prior to 7.2.5

Question:
During a refueling outage, the operator using the Spent Fuel Handling Machine is lifting a fuel bundle for placement in the inspection elevator. After the bundle has been lifted approximately 20" the operator notes the following:

- Hoist upward motion has automatically stopped.
- The CRT screen for the Spent Fuel Handling Machine is displaying "Fuel Overload" in a red box.
- Hoist Load Readout indicates 1712 lbs.

The operator attempts to lower the bundle back into its storage rack, and is successful in doing so. What is the correct assessment of the Spent Fuel Handling Machine operation?

a. The Hoist Emergency Up Limit functioned per design.

b. The Hoist Underload interlock should have prevented lowering the bundle.

c. The Hoist Overload interlock should have prevented any bundle movement.

d. The Hoist Overload interlock functioned per design.

DISTRACTOR ANALYSIS

a. Candidate correctly believes that a limit/interlock functioned per design; but fails to correctly interpret the Hoist Load Readout indication. A value of 1712 lbs. is an overload condition.
b. Candidate incorrectly applies knowledge of the underload interlock.
c. Candidate correctly recognizes conditions where the overload interlock applies, but incorrectly believes the interlock would prevent lowering a bundle.
d. **CORRECT - This interlock prevents any further movement upward, but allows the operator to insert the bundle back to a safe location.**

Cognitive Level: HIGH 2
Recognize consequences or implications. Candidate must apply system knowledge of automatic operation of the load limits for the Fuel Handling System, and the recognize which implication is correct.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 60

K/A: 041 Steam Dump / Turbine Bypass Control K6.03
Knowledge of the effect of a loss or malfunction on controller and positioners, including ICS, S/G, CRDS will have on the SDS.

Tier: 2 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 4
Group: 3 **SRO Imp:** 2.9 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: For the following Main Steam system major components, (MSS_CK02.0)
Atmospheric Steam Dump Valves (ADVs), Turbine Bypass Valve (TBV)
* describe the operational design of each component
* describe the normal operating range of the component

References: ONP-13, rev 7; DBD 1.09, 3.2.2.2

Question:
Given the following conditions:

- The plant is in MODE 3 following a reactor trip from 100% power.
- PCS temperature is being controlled with the Turbine Bypass Valve in AUTO
- The Atmospheric Steam Dumps are closed with the control room C-02 panel Steam Dump Controller, HIC-0780A in AUTO
- The Average Temperature Display Select Switch is in the LOOP 2 position

Which of the following describes the effect of a loss of the Tave signal from TYT-0200 (e.g., signal failed LOW) on the plant. (Assume NO operator action has been taken.)

a. The only means of PCS heat removal with the secondary plant is via the Main Steam Code Safety valves.

b. The Turbine Bypass Valve fails closed and will NOT open until the Average Temperature Display Select Switch is placed in LOOP 1 position.

c. The Turbine Bypass Valve fails closed and will NOT open. The ADVs will open on a quick open signal.

d. The TBV will modulate open/closed to maintain S/G pressures at setpoint. The ADVs will NOT modulate open.

DISTRACTOR ANALYSIS

a. Candidate exhibits deficient basic knowledge of TBV and ADV control signal inputs.
b. Incorrect application of TBV control circuit design.
c. Candidate correctly identifies response of the ADVs; however, TBV will continue to function since it controls on main steam pressure, and not on Tave.
d. **CORRECT - The Turbine Bypass Valve controls on either the dump control error signal OR main steam pressure signal, whichever is highest; therefore TBV operation for these conditions is relatively unaffected. For the ADVs, losing the Tave signal disables auto operation of the ADVs.**

Cognitive Level: HIGH 2
Describe/recognize consequences or implications. Candidate must use knowledge of inputs and outputs of the controllers and positioners mentioned to determine the consequences of the malfunction.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 61

K/A: 078 Instrument Air K3.02
Knowledge of the effect that a loss or malfunction of the IAS will have on systems having pneumatic valves and controls.

Tier: 2 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** **4**
Group: 3 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7
Palisades Training Objective: Given an Off Normal event and control room references, describe the effect of the Off Normal condition on affected plant systems and components: (IOTF1_CK15.0)

References: ONP-7.1, 4.1, rev 13 M-204, sh. 1

Question:
Assume the plant is on Shutdown Cooling when a complete loss of Instrument Air occurs.

Which of the following describes the effect on the Shutdown Cooling System and on the Primary Coolant System (PCS)?

a. Since CV-3006, SDC Hx Bypass, fails CLOSED, the PCS will begin to heat up.

b. Since CV-3025, SDC Hx Outlet, fails CLOSED, the PCS will begin to heat up.

c. Since CV-3006, SDC Hx Bypass, fails OPEN, there is a concern for PCS overcooling.

d. Since CV-3025, SDC Hx Outlet fails OPEN, there is a concern for PCS overcooling.

DISTRACTOR ANALYSIS

a. Correct application of system response, but for the incorrect reason.
b. **CORRECT - Since CV-3025 is on the outlet of the SDC heat exchanger, and is failed CLOSED, that means there is no component cooling water providing cooling to SDC return to the PCS.**
c. Candidate corrrectly identifies CV-3006 response, however, this response is not the reason for overcooling response.
d. Incorrect valve response, incorrect effect on PCS.

Cognitive Level: HIGH 3
Predict an outcome. Candidate is required to apply system operational knowledge along with effects of the loss of instrument air to predict an outcome on the Primary Coolant System.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 62

K/A: 103 Containment K4.04
Knowledge of containment system design feature(s) and/or interlock(s) which provide for personnel access hatch and emergency access hatch.

Tier: 2 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** 2
Group: 3 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: For the following Containment System major components: Personnel Airlock and Emergency Escape Airlock (CTMT_CK02.0)
Describe the operational design of each component in accordance with DBD 2.09 and FSAR Chapter 6.

References: DBD 5.8.6.2.1, rev 23

Question:
Which one of the following describes interlock features on the Personnel Air Lock and Escape Air Lock doors which are designed to ensure Containment integrity?

a. Personnel Air Lock doors cannot be opened at the same time as Escape Air Lock doors.

b. Both doors on the Personnel Air Lock and the Escape Air Lock close and lock on a Containment High Pressure (CHP) or Containment High Radiation (CHR) condition.

c. A timer ensures that the Personnel Air Lock and the Escape Air Lock inner and outer doors can be opened at the same time ONLY for a maximum of 30 seconds.

d. The inner door cannot be opened at the same time as the outer door for the Personnel Air Lock and also for the Escape Air Lock.

DISTRACTOR ANALYSIS

a. Though this may sound like a desireable feature, these doors are on opposite sides of containment and there is NO interlock between them.
b. Another desireable sounding feature, since there are a number of component auto operations affected by CHP/CHR; however, there is no such design feature.
c. There is no such design feature.
d. **CORRECT - Per design, both doors are interlocked so that only one can be opened at a time to maintain containment integrity.**

Cognitive Level: LOW
Recall specific facts. Candidate must recall design features of the airlock system.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 63

K/A: 2.1.19 Ability to use plant computer to obtain and evaluate parametric information on system or component status.

Tier: 3 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** 3

Group: 1 **SRO Imp:** 3.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 45.12

Palisades Training Objective: For the Plant Process Computer: a. List the Control Room indications, b. Describe the Control Room instrumentation and controls, c. List the alternate or remote indications, d. Describe the alternate or remote controls. (PPC_CK08.0)

References: PPC User's Manual Operator Aid 178

Question:
During a Loss of Coolant Accident inside containment the operator notes that the Plant Process Computer (PPC) displayed value for containment pressure has changed color from MAGENTA to WHITE. How is this information obtained on the PPC and what is its significance?

a. Depress "URGNT" hardkey. Containment pressure is now LESS THAN the alarm level setpoint.

b. Depress "ALARM" hardkey. Containment pressure is now ABOVE the alarm level setpoint.

c. Depress "EVENT" hardkey. A Containment High Pressure (CHP) has just actuated.

d. Depress "UPDATE" hardkey. Criteria for resetting Containment High Pressure are now met.

DISTRACTOR ANALYSIS

a. **CORRECT - Per PPC operating manual the URGNT hardkey is used to access the information, and it is interpreted as shown here.**
b. Though this hardkey does exist, it would not be used for the condition; candidate also misinterprets the significance of the indication.
c. Incorrect usage of this hardkey; candidate also misinterprets the significance of the indication.
d. UPDATE key is a commonly used key on the PPC, but not for this application; further, candidate misinterprets signficance of the indication.

Cognitive Level: LOW
Knowledge and memory of patterns, or other specific facts. Candidate must recall the significance of the PPC indication given for the listed plant condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 64

K/A: 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Tier: 3 **RO Imp:** 3.9 **RO Exam:** Yes **Difficulty:** **3**

Group: 1 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 45.2 / 45.6

Palisades Training Objective: Describe the purpose of Palisades administrative procedure AP-10.51, "Writer's Guideline for Procedures" in accordance with AP-10.51 Section 1.0. (APPR_CK01.03)

References: GOP-2, Att.1, step 5.9, rev 24Admin 10.51, Att. 4, 5, and 19, rev 13

Question:
Note Step 5.9 of the attached procedure excerpt from GOP-2. Reference will also be made to SOP-7, "Main Steam System".

To perform the operation of verifying that MSIV closure is UNBLOCKED, how are the above procedures to be implemented?

a. You must EXIT GOP-2, and go to SOP-7 to perform the unblocking.

b. You REMAIN in GOP-2 and refer to SOP-7 to perform the unblocking.

c. Unblocking is performed per GOP-2 only. Use of SOP-7 is NOT required.

d. Unblocking is performed per SOP-7 only. Use of GOP-2 is NOT required.

DISTRACTOR ANALYSIS

a. There is NO reference or direction to either REFER TO or GO TO the SOP.
b. There is NO reference or direction to either REFER TO or GO TO the SOP.
c. **CORRECT - The details of the step are given in the GOP; no use of the SOP is required. Also, SOP-7 makes no reference to this operation.**
d. SOP-7 makes no reference to this operation. More importantly, the GOP is the governing document and clearly prescribes required actions for the operation.

Cognitive Level: LOW
Knowledge of procedural steps; definitions. Candidate must recognize which procedure to use, and the proper use of that procedure, and apply knowledge of various types of procedures to eliminate incorrect choices.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **GOP-2, step 5.9 on page 15, rev. 24**

Question Number: 65

K/A: 2.1.29 Knowledge of how to conduct and verify valve lineups.

Tier: 3 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** **2**

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.10 / 45.1 / 45.12

Palisades Training Objective: Given references, explain the requirements for "Checklist Documentation" in accordance with AP-4.02. (ISAA_E03.08)

References: AP 4.02, 5.3.1.a, 7.3, rev 18

Question:
During the performance of a system checklist the position of a valve is found OPEN when the valve is required to be CLOSED by the checklist. Which of the following describes the sequence of actions required to be taken by the operator?

a. 1. Record the valve's current position on the checklist.
   2. Continue and complete the checklist.
   3. Inform the Shift Supervisor.

b. 1. Obtain the Shift Supervisor's authorization to reposition the valve.
   2. Reposition the valve CLOSED.
   3. Record on the checklist the new position.

c. 1. Record the valve's current position on the checklist.
   2. Obtain the Shift Supervisor's authorization to reposition the valve.
   3. Position the valve CLOSED.

d. 1. Position the valve to the CLOSED position.
   2. Record valve's original position on the checklist.
   3. Inform the Shift Supervisor.

DISTRACTOR ANALYSIS

a. Incorrect actions and sequence.
b. **CORRECT - SS is the ultimate authority for repositioning. Documentation reflects the final desired position of the equipment, per SS permission.**
c. Incorrect actions and sequence.
d. Incorrect actions and sequence.

Cognitive Level: LOW
Recall specific facts; knowledge of procedural steps. Candidate must recall the correct sequence of steps required for the given conditions.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 66

K/A: 2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.

Tier: 3 **RO Imp:** 4.0 **RO Exam:** Yes **Difficulty:** **3**

Group: 2 **SRO Imp:** 3.5 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 45.2

Palisades Training Objective: Describe the design features and interlocks that provide the following Electrical Distribution system functions: Interlocks between automatic bus transfer and breakers; Paralleling of AC sources
(SPS_CK09.0)

References: SOP-30, 7.1.1.d.1, rev 37

Question:
Given the following plant conditions:

- After a plant startup a power ascension is in progress.
- Power is now at 25%.
- The NCO is transferring 4160V buses from Startup Power to Station Power.
- Bus 1A, 1B, 1F, and 1G Startup Power Incoming breakers are CLOSED.
- The NCO has NOT taken manual action to energize any synchroscope.

When the NCO attempts to close breaker 252-101 (Bus 1A Station Power Incoming) which of the following will occur?

a. The breaker will NOT close unless the synch check relay is manually energized.

b. The breaker will NOT close unless the NCO opens Bus 1A Startup Power Incoming breaker.

c. The breaker WILL close because the synch check relay is not required at this power level.

d. The breaker WILL close because the synch check relay has automatically energized.

DISTRACTOR ANALYSIS

a. **CORRECT - Per system design, the synch check relay must be energized. It is a permissive to closing the breaker.**
b. Candidate correctly exhibits concern for paralleling sources, and this is a seemingly logical action, however, it is incorrect.
c. Breaker will NOT close unless the synchroscope relay is energized.
d. Candidate incorrectly believes the synchroscope automatically energizes.

Cognitive Level: HIGH 3
Predict an outcome. Candidate must apply system knowledge of synchroscope design to predict the outcome of the given switch operation.

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 67

K/A: 2.2.13 Knowledge of tagging and clearance procedures.

Tier: 3 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** **3**

Group: 2 **SRO Imp:** 3.8 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given any Plant Conditions, determine the applicable Tagging Rules IAW AP 4.10. (PSTOT00.02)

References: AP 4.10, Attachment 1, 3.8.a, b, rev 13

Question:
Refer to the following list of valve operations:

1. Close discharge valve.
2. Close suction valve.
3. Open discharge valve.
4. Open suction valve.

Which of the following describes the required sequence of valve operations when tagging out and subsequently restoring to service of a centrifugal pump?

	TAGOUT		RESTORE
a.	1,2	then	4,3
b.	2,1	then	4,3
c.	1,2	then	3,4
d.	2,1	then	3,4

DISTRACTOR ANALYSIS

a. **CORRECT - As prescribed in the procedure.**
b. Incorrect sequence
c. Incorrerct sequence
d. Incorrect sequence

Cognitive Level: LOW
Recall specific facts; knowledge of procedural steps. Candidate must sequence the given steps properly.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 68

K/A: 2.2.27 Knowledge of the refueling process.

Tier: 3 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** **3**

Group: 2 **SRO Imp:** 3.5 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.6 / 45.13
Palisades Training Objective: Given refueling conditions, state the water level requirements for the following IAW GOP 11 and Technical Specifications: Refueling canal and Minimum water level above any fuel assembly

(IOTDK.14)

References: GOP-11, Att. 2, 1.1.8, rev 35

Question:
During refueling operations, which one of the following Spent Fuel Pool water levels is the LOWEST level which allows irradiated fuel handling activities?

a. 6" below skimmers

b. 10" below skimmers

c. 14" below skimmers

d. 18" below skimmers

DISTRACTOR ANALYSIS

a. Incorrect specified level
b. **CORRECT - Since one foot (12") below skimmers is the lowest allowed level, 10" below the skimmers is acceptable, since that is 2" higher than the minimum required.**
c. Incorrect specified level
d. Incorrect specified level

Cognitive Level: LOW
Recall specific facts. Candidate must recall the minimum level allowed for the given conditions.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 69

K/A: 2.2.34 Knowledge of the process for determining the internal and external effects on core reactivity.

Tier: 3 **RO Imp:** 2.8 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** 3.2 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.6

Palisades Training Objective: Given plant conditions, perform an ECP calculation IAW EM-04-24. (RTA_E03.01)

References: GOP-3, 5.1.1.b, Attachment 2, rev 18

Question:
Which one of the following describes the process of inverse multiplication plotting (1/M plot) during a reactor critical approach?

a. After each rod withdrawal wait until the startup rate reduces to near "0" before obtaining 1/M count rates.

b. Any of the available neutron flux instruments listed on the plot form may be used for any interval.

c. To ensure consistency the same plot form must be used throughout the entire critical approach.

d. 1/M plot data is obtained by dividing the SUBSEQUENT neutron flux reading by the INITIAL neutron flux readings.

DISTRACTOR ANALYSIS

a. **CORRECT - This method provides assurance that the reactor is or is not critical after each rod withdrawal.**
b. There is a requirement regarding use of nuclear instrumentation, but candidate has misapplied it here.
c. Misapplied requirement. It actually requires using a new plot form each time.
d. Misunderstands or misapplies the relationship for obtaining 1/M values. The correct division is to divide the initial by the subsequent reading.

Cognitive Level: LOW
Knowledge of procedural steps. Candidate must recall the steps involved, including method, for performing 1/M plots.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 70

K/A: 2.3.1 Knowledge of 10CFR: 20 and related facility radiation control requirements.

Tier: 3 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** **3**

Group: 3 **SRO Imp:** 3.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.12 / 43.4 / 45.9 / 45.10

Palisades Training Objective: State Consumer's Energy administrative dose limits. (RWT16)

References: 10CFR20.1201, item (a)(2)(i) - 15R AP 7.04, Att. 1, page 2, rev 19 - 6R

Question:
During a plant emergency an operator receives a radiation exposure of 7 REM to the lenses of both eyes.

Regarding 10 CFR 20, "Standards for Protection Against Radiation" and Palisades administrative radiation control limits, which, if any, of these limits have been exceeded?

a. BOTH 10CFR20 AND plant admin. limits have been exceeded.

b. NEITHER of the exposure limits listed have been exceeded.

c. 10CFR20 limits have been exceeded, but NOT plant admin. limits.

d. Plant admin. limits have been exceeded, but NOT 10CFR20 limits.

DISTRACTOR ANALYSIS

a. Candidate fails to recall the correct limits.
b. Candidate fails to recall the correct limits.
c. Candidate fails to recall the correct limits.
d. **CORRECT - The Admin limit is 6R and the Federal limit is 15R.**

Cognitive Level: LOW
Recall specific facts. Candidate must recall the specified exposure limits

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 71

K/A: 2.3.2 Knowledge of facility ALARA program.

Tier: 3 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 4

Group: 3 **SRO Imp:** 2.9 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.12 / 43.4 / 45.9 / 45.10

Palisades Training Objective: Describe Consumer' Energy ALARA program. (RWT21)

References: AP 7.02, 6.2

Question:
All of the following are elements of the Palisades ALARA program **EXCEPT**:

a. dose estimating.

b. temporary shielding.

c. Hot Spot Program.

d. Consummables Control Program.

DISTRACTOR ANALYSIS

a. This is an element of the Palisades ALARA program.
b. This is an element of the Palisades ALARA program.
c. This is an element of the Palisades ALARA program.
d. **CORRECT - Consummables Control Program is a separate program.**

Cognitive Level: LOW
Recall specific facts. Candidate must recall the elements of the ALARA program.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 72

K/A: 2.3.11 Ability to control radiation releases.

Tier: 3 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** **3**

Group: 3 **SRO Imp:** 3.2 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 45.9 / 45.10

Palisades Training Objective: Given plant conditions, describe the administrative requirements required for releasing a WGDT with RIA-1113 inoperable in accordance with ODCM and SOP-18A. (RMS_E03.01)

References: SOP-18A, 7.5.c, rev 33

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

For this condition, ALL of the following are actions that would allow initiating the release **EXCEPT**:

a. Ensure BOTH Main Exhaust Fans, V-6A and V-6B, are running.

b. Perform independent verification of the discharge flowpath lineup.

c. Obtain an additional sample of the tank contents.

d. Perform independent verification of the release rate calculations.

DISTRACTOR ANALYSIS

a. **CORRECT - One Main Exhaust Fan must be running; starting an additional fan would NOT alleviate/reduce any requirements for monitoring the batch.**
b. A valid alternative action.
c. A valid alternative/compensatory action.
d. A valid compensatory action.

Cognitive Level: LOW
Knowledge of procedural steps and cautions. Candidate must recall the required procedurally allowed alternate methods of ensuring release requirements are met.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 73

K/A: 2.4.14 Knowledge of general guidelines for EOP flowchart use.

Tier: 3 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** **2**

Group: 4 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given Plant conditions requiring performance of an EOP step, determine if it is nonsequential or continuous and the required actions IAW the in-use EOP and Administrative Procedure 4.06. (TBAA_E04.02)

References: AP 4.06, page 5 of 27, rev 12

Question:
Refer to the attached excerpt (page 8 of 40) from EOP-8.0.

Which of the following describes the type of step 7.a is, and the sequence of when it can be performed?

a. Continuous Step - can be performed anytime during the event.

b. Concurrent Step - must be performed at the same time as Step 6.1.

c. Sequential Step - must be performed right after Step 6 is complete.

d. Non-Sequential Step - can be performed when stated conditions exist.

Special Note:
This KA is obviously and primarily intended for Westinghouse plant (which use flowcharts for all EOP steps). Therefore, the intent of this KA is met by the above question, since it is testing knowledge and understanding of the "flow" of EOP step implementation, and not exclusively a flow CHART.

DISTRACTOR ANALYSIS

a. Candidate identifies correct definition of Continuous Step; however, this is not a continuous step.
b. Candidate identifies correct definition of Concurrent Step; however, this is not a concurrent step.
c. This is not a sequential step.
d. **CORRECT - Correct definition of type of step.**

Cognitive Level: LOW
Knowledge of definitions. Candidate must know the definition of a non-sequential step.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: EOP-8.0, page 8 (attached)

Question Number: 74

K/A: 2.4.24 Knowledge of loss of cooling water procedures.

Tier: 3 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** 2

Group: 4 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given the plant at power, evaluate plant conditions and trip or recommend tripping/shutting down the Reactor when warranted in accordance with AP-4.14, Conduct Of Operations, and in use ARPs and ONPs. (IOTF1_T15.00)

References: ONP 6.1, rev 11

Question:
During a plant startup, the following conditions exist:

- The Main Generator has just been synchronized to the grid.
- A problem with CV-1359, Non-critical Service Water Isolation, occurs such that CV-1359 is failed partially closed an undetermined amount.
- The following alarm has annunciated:

  * EK-1165, NON CRITICAL SERV WATER LO PRESS

- No other alarms have annunciated.

Which one of the following actions is required?

a. Trip the Reactor within 10 seconds.

b. Trip the Reactor if Exciter Cooler Hi Temp alarm annunciates.

c. Trip the Main Turbine within 10 seconds.

d. Trip the Main Turbine if Exciter Cooler Hi Temp alarm annunciates.

DISTRACTOR ANALYSIS

a. Incorrectly believes that exciter damage will occur within 10 seconds (this was the previous, no longer valid assumption).
b. Correct cue indication, but incorrect action.
c. Incorrectly believes that exciter damage will occur within 10 seconds (this was the previous, no longer valid assumption).
d. **CORRECT - Alarm annunciation is reasonable assurance that serious damage is imminent.**

Cognitive Level: HIGH 2
Knowledge of consequences or implications; how systems interact. Candidate must apply knowledge of the service water system and how it interacts with turbine generator components, and determine the consequences of a loss of service water and required actions.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 75

K/A: 2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.

Tier: 3 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **3**

Group: 4 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.3 / 45.12

Palisades Training Objective: Given transient plant conditions resulting in a reactor trip and, given control room indications, determine the impact those indications have on each safety function. (TBAB_E01.05)

References: ARP-3, window 52, rev 58 ARP-4, window 42, rev 56 P&ID E-17, sh. 12

Question:
Note the following two alarms:

EK-0552, DIESEL GENERATOR NUMBER 1-1 START SIGNAL BLOCKED

EK-0742, PRESSURIZER HTR BUS GROUND/UNDERVOLTAGE

For a Loss of all Offsite Power event, which one of the following describes the significance of the alarm condition which results in a direct effect on the HIGHER priority safety function?

a. D/G 1-1 will not start automatically, but can be started manually from the Control Room.

b. D/G 1-1 will not start automatically, and cannot be started manually from the Control Room.

c. ALL Pressurizer heaters are deenergized and will remain deenergized.

d. SOME Pressurizer heaters will regain power after a load sequencing.

DISTRACTOR ANALYSIS

a. Correctly identifies safety function priority, but misapplies system knowledge for effect on equipment.
b. **CORRECT - The start signal blocked indicates the EDG cannot be started by any means.**
c. Incorrectly identifies safety function priority.
d. Incorrectly identifies safety function priority.

Cognitive Level: HIGH 3
Synthesis level of knowledge required; sorting; and predicting an outcome. This question tests at the highest cognitive level. It requires the candidate to understand system operation in the context of alarm conditions; predict the impacts of the condition, and to think about all of it in a new and different way, i.e., prioritizing.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 1

K/A: 000055 Station Blackout / 6 G 2.4.49
Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Tier: 1 **RO Imp:** 4.0 **RO Exam:** Yes **Difficulty:** **2**

Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.2 / 45.6

Palisades Training Objective: Given a reactor trip situation, from memory, perform the actions of EOP 1.0 in accordance with Operations Standards. (TBAB_T01.00)

References: EOP-1.0, 11. b.2., rev 12

Question:
Given the following plant conditions:

- The plant was at 60% power when a Loss of All Offsite Power occurred.
- Initially NO Diesel Generator was running.
- During the performance of EOP-1.0, "Standard Post-Trip Actions" D/G 1-1 was started.
- Critical Service Water header pressure is 25 psig and stable.
- Pressurizer pressure is 1900 psia and stable.
- Safety Injection has NOT actuated.

The first action required is to CLOSE ...

a. Containment Air Cooler high capacity valves as needed.

b. CV-0847, Containment Air Cooler Supply.

c. CV-1359, Non-critical Service Water isolation.

d. Containment Air Cooler outlet bypass valves as needed.

DISTRACTOR ANALYSIS

a. **CORRECT - This provides more control over any adjustments and maintain containment cooling while providing boost to SW header pressure.**
b. Candidate correctly interprets the need to boost SW pressure, but this action would remove ALL SW cooling to containment, and is the incorrect action.
c. This action has already occurred automatically on the Safety Injection.
d. Incorrect action.

Cognitive Level: HIGH 3
Predict an event or outcome; solve a problem. Requires candidate to analyze plant conditions and diagnose what is occurring, and then to solve the problem by selecting an action that will mitigate the condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 2

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4 G 2.4.31
Knowledge of annunciators alarms and indications, and use of the response instructions.

Tier: 1 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **BANK (Direct)**

Applicable 10CFR55 Section:

Palisades Training Objective: Given plant conditions, remove Primary Coolant System Voids IAW EOP Supplement 26. (TBAC_T01.00)

References: EOP Supplement 26, and Basis

Question:
Given the following plant conditions:

- A small break loss of coolant accident has occurred.
- Both Safety Injection and Containment High Pressure have initiated.
- HPSI Pump P-66A has failed to start.
- Actual Pressurizer level is 34% and rising rapidly.
- Actual Pressurizer pressure is 1060 psia and slowly lowering.
- Average of the Qualified CETs is 560ºF and slowly lowering.
- All Primary Coolant Pumps (PCP) are stopped.
- The accident initiated 30 minutes ago.

Which one of the following describes what is occurring and a prescribed action which will mitigate the condition?

a. Steam Generator tube voiding is occurring. Start one PCP in each loop to sweep any voids from hotter areas.

b. Reactor head voiding is occurring. Raise Pressurizer pressure within procedural limits to try collapsing the void.

c. Safety Injection flow is excessive. Throttle Safety Injection to stabilize Pressurizer level.

d. Safety Injection flow is inadequate. Lower Pressurizer pressure in order to raise HPSI flow.

DISTRACTOR ANALYSIS

a. Correct interpretation of voiding indications, but for the incorrection location, and incorrect action.
b. **CORRECT - Rapidly rising Pressurizer level, combined with indicated saturation conditions, indicates reactor head voiding. Raising pressure is attempt to eliminate saturation conditions.**
c. Candidate misinterprets significance of Pressurizer level increase.
d. Correct identification of injection flow status, but incorrect corrective action.

Cognitive Level: HIGH 3
Predict an event or outcome; solve a problem. Requires candidate to analyze plant conditions and diagnose what is occurring, and then to solve the problem by selecting an action that will mitigate the condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 3

K/A: 000007 (BW/E02&E10, CE/E02) Reactor Trip Stabilization-Recovery / 1 A2.01
Ability to determine or interpret decreasing power level, from available indications.

Tier: 1 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: Given post reactor trip conditions, analyze a given parameter trend and determine if the trend is responding as expected. (TBAB_E01.01)

References: EOP-2.0 Basis, page 2, 29, and 30 rev 10

Question:
During the performance of EOP-2.0, "Reactor Trip Recovery", which one of the following describes the expected response of reactor power?

After the initial rapid power reduction reactor power will stabilize at ...

a. 10^{-4}% and then slowly lower over a period of hours.

b. the subcritical multiplication level and then slowly lower.

c. the subcritical multiplication level and then remain at that level.

d. 10^{-4}% and then rise slowly over a 24 hour period as Xenon burns out.

DISTRACTOR ANALYSIS

a. Selects incorrect power level (reactor is still critical at this power level).
b. **CORRECT - Reactor Trip Recovery procedure provides this guidance and trend.**
c. Selects correct power level, but incorrect trend.
d. Incorrect power level, and misinterprets the significance of Xenon for these conditions.

Cognitive Level: LOW
Recall of specific facts. Candidate must recall what is expected on available indications for lowering reactor power during the Reactor Trip Recovery emergency procedure.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 4

K/A: 00022 Loss of Reactor Coolant Makeup / 2 G 2.1.27
Knowledge of system purpose and or function.

Tier: 1 **RO Imp:** 2.8 **RO Exam:** Yes **Difficulty:** **2**

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Given plant conditions, describe the consequences of failing to monitor PZR and VCT level following isolation of letdown and charging at rated conditions. (CVCS_E011.01)

References: DBD 1.04, 3.3.8.4

Question:
Given the following conditions:

- The plant is at 100% power.
- An instrument failure caused letdown to isolate.
- Charging and Letdown are secured.
- Tave is maintained constant.

What is the expected effect of the above conditions?

a. Pressurizer level lowers, Volume Control Tank level rises.

b. Pressurizer level is constant, Volume Control Tank level lowers.

c. Pressurizer level lowers, Volume Control Tank level is constant.

d. Pressurizer level is constant, Volume Control Tank level rises.

DISTRACTOR ANALYSIS

a. **CORRECT - Pressurizer level will lower at ~4 gpm due to PCP bleedoff, which goes to the VCT.**
b. Incorrect application of system knowledge and interfaces.
c. Incorrect application of system knowledge and interfaces.
d. Incorrect application of system knowledge and interfaces.

Cognitive Level: HIGH 2
How systems interact. Candidate must understand how the Pressurizer Level Control System interacts with the Chemical and Volume Control System. To some extent, an outcome has to be predicted (3H), but the predominant intent of the question is at the 2H level.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 5

K/A: 000029 Anticipated Transient w/o Scram / 1 A2.01
Ability to determine or interpret reactor nuclear instrumentation as it applies to ATWS.

Tier: 1 **RO Imp:** 4.4 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given a loss or malfunction of the NI System describe the effects on the following: Reactor Protection System , Control Rod Drive System (CK11.0)

References: ARP-21, Rack A, window 2 ARP-21, Rack D, window 6

Question:
During a plant startup and just prior to Main Generator synchronization the following conditions exist:

- Reactor power is stable at 9%.
- Main Turbine speed is at 1800 RPM.

Subsequently, Wide Range Log Channel NI-03 fails HIGH.

- Reactor power remains stable at 9%.
- Main Turbine speed remains at 1800 RPM.

Which of the following is the correct assessment of the above conditions?

a. Plant responded as expected since the Reactor Protective System trip associated with the failed instrument is not active until greater than 15% power.

b. Plant responded as expected since the Reactor Protective System trip associated with the failed instrument requires failure of BOTH Wide Range channels to cause a Reactor trip.

c. The Reactor should have tripped due to the fact that one Wide Range channel supplies signals to TWO RPS channels.

d. The Reactor should have tripped due to the fact that one Wide Range channel supplies signals to ALL RPS channels.

DISTRACTOR ANALYSIS

a. Selects incorrect plant response.
b. Selects incorrect plant response.
c. **CORRECT - WR instruments do provide signals to TWO RPS channels. At less than 15% reactor power, this condition exceeds RPS setpoint and reactor will trip on 2/4 logic.**
d. Selects correct plant response, but for the incorrect reason.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate must assess plant conditions and use knowledge to predict how the plant and the Reactor Protection System should have responded.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 6

K/A: 000033 Loss of Intermediate Range NI / 7 G 2.4.6
Knowledge of symptom based EOP mitigation strategies

Tier: 1 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.5 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: EOP-9.0 Basis for RC-1, p. 40 of 104, rev. 15

Question:
Given the following conditions:

- The plant was at 89% power when an accident occurred which required a manual reactor trip.
- Three (3) control rods will NOT insert into the core.
- All Wide Range Nuclear Instruments (NIs) have become INOPERABLE.
- The crew is implementing EOP-9.0, "Functional Recovery Procedure" and have chosen Success Path RC-1 for Reactivity Control.

What is the effect, if any, on the Reactor Operator's ability to check the status of the Reactivity Control safety function due to the loss of the Wide Range NIs?

a. No effect, since Reactivity Control is satisfied due to Xenon building in for the next approximately 10-12 hours.

b. Reactivity Control must be satisfied by manually driving down ONE of the stuck control rods.

c. Will need to check Reactor power at less than 100 cps and constant or lowering using the Source Range NIs.

d. Will need to check Reactor power at less than 2% using delta T power indication.

DISTRACTOR ANALYSIS

a. Incorrect required compensatory monitoring method.
b. Incorrect required compensatory monitoring method.
c. **CORRECT - This method is prescribed by the functional recovery procedure.**
d. Incorrect required compensatory monitoring method.

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate is required to describe the implications and consequences of the loss of Wide Range NIs and how that impacts monitoring ability, and any alternate means that can be used to ensure Reactivity Control.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 7

K/A: 000058 Loss of DC Power / 6 A2.02
Ability to determine and interpret 125V dc bus voltage, low/critical low, alarm as they apply to the Loss of DC Power.

Tier: 1 **RO Imp:** 3.3. **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank Direct (1999 NRC R83)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given an Off Normal event and control room references, describe the effect of the Off Normal condition on affected plant systems and components: (IOTF1_CK15.0)

References: ONP-2.3, 6.0.2 (NOTE prior to), rev 12

Question:
Given the following plant conditions:

- PCS temperature is 420ºF.
- Variable Low Temperature Overpressure Protection (LTOP) system is armed in LTOP mode.
- Charging Pump P-55A is operating.
- Letdown is in service.

The following alarm then annunciates:

EK-0547, 125V DC BUS GROUND

Immediately after this alarm, DC Panel D-11-1 voltage drops to 0 volts. With NO operator action, Primary Coolant System leakage will occur due to ...

a. PIC-0202, CVCS Letdown Pressure Controller, failing CLOSED.

b. CV-2009, Letdown Isolation Valve, failing CLOSED.

c. PRV-1042B, Pressurizer PORV, failing OPEN.

d. PT-0105B, Wide Range Pressurizer Pressure, failing HIGH.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that PIC-0202 will lose power when panel D11-1 fails, but power is supplied to the controller through an inverter.
b. **CORRECT - CV-2009 fails closed on a loss of DC power. This will cause PCS leakage through letdown relief valve RV-2006 since PCS pressure is now felt at the valve.**
c. Candidate incorrectly believes that the fail position of PRV-1042B is open, but it actually fails closed on a loss of DC power.
d. Candidate incorrectly believes that PT-0105B will lose power on the loss of D11-1, but power is received through an inverter.

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate must recognize use knowledge of the DC system and associated alarms to explain expected consequences and implications of the loss. And to some extent, candidate is required to predict an event or outcome (PCS leakage) as a result of the loss, though the predominant intent of the question is at the HIGH 2 level.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 8

K/A: 000056 Loss of Offsite Power / 6 A2.20
Ability to determine and interpret AFW flow indicator as it applies to the Loss of Offsite Power.

Tier: 1 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** **4**
Group: 3 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: For automatic actions associated with the Auxiliary Feedwater System:
* AFAS actuation (including C-187 sensors)
* Pump auto start sequence
* Pump trip
* State the parameter and value (setpoint) at which each automatic action occurs
* Explain the purpose of each automatic actuation

in accordance with E-17, Sheets 21, 21A, 22. (AFW_CK10.0)

References: DBD-5.05, Table 3.1-4, Table 3.1-6, rev 6

Question:
Given the following conditions:

- The plant is at full power when a Loss of All Offsite Power occurs.
- BOTH Diesel Generators have started and loads are sequencing.
- The Reactor trips, but the Main Turbine does NOT automatically trip.
- Steam Generator (S/G) levels quickly lower to approximately 10% before the NCO manually trips the Main Turbine.
- 30 seconds after manually tripping the Main Turbine the NCO notes that Auxiliary Feedwater (AFW) flow indicates 0 gpm to each S/G.

What action, if any, is required, and why?

a. No action is required, since AFW Pump P-8A will be sequenced on and deliver design flow to each S/G.

b. The operator must manually initiate AFAS (Aux. Feed Actuation Signal) due to the Loss of Offsite Power.

c. The operator must manually start AFW Pump P-8C since P-8A has failed to start on low Steam Generator level.

d. No action is required since no power is available to motor driven AFW pumps and the turbine driven AFW pump will deliver design flow in 92 seconds.

DISTRACTOR ANALYSIS

a. **CORRECT - With a valid standing AFAS, P-8A will sequence on and provide flow.**
b. Candidate incorrectly believes any AFAS signal is lost when power is lost, but S/G levels are below AFAS actuation setpoint, and with proper load sequencing AFAS will occur, with flow provided.
c. Candidate incorrectly believes P-8A has FAILED to start, but in reality it has not been sequenced on yet.
d. Candidate incorrectly believes AFW pumps are not sequenced on to the D/Gs, but they are.

Cognitive Level: LOW
Recall setpoints and specific facts. Candidate must show ability to use knowledge of AFW system setpoints and sequencing operation to determine the correct system response.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 9

K/A: 001 Control Rod Drive K6.03
Knowledge of the effect of a loss or malfunction on reactor trip breakers, including controls.

Tier: 2 **RO Imp:** 3.7 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Describe the design features and interlocks that provide the following Control Rod Drive System functions: Automatic rundown of control rods (1-41) after a Reactor Trip. (CRD_CK09.0)

References:

Question:
During a critical approach the following conditions exist:
- All Shutdown Rods are fully withdrawn.
- Control Rod Drive Motor power is selected as shown in photo below.
- Motor Control Center #1 de-energizes.

For the above conditions, which one of the following is true?

a. The Reactor trip breakers remain closed, but a rod drivedown automatically inserts the Shutdown Rods.

b. If the Reactor were to trip for some reason, rod drivedown would NOT occur.

c. The Reactor cannot be tripped unless HS-C15-MBTS is selected to "Bus #1".

d. Automatic Reactor trips are disabled, but the Reactor can be manually tripped from C-01 or C-06.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes a rod drivedown would occur, but this only occurs on a reactor trip.
b. **CORRECT - Since switch is selected to breaker 52-125, this means that if MCC 1 were deenergized, rod drive motors cannot be energized.**
c. Candidate misunderstands the function of this switch, and of RPS trip circuitry for trip breakers.
d. Candidate misunderstands the function of this switch, and of RPS trip circuitry for trip breakers.

Cognitive Level: HIGH 2
How systems interact; describing consequences or implications. Candidate is required to show knowledge of the relation between control rod drive system and the power select system and then determine the implications of that relationship for a particular plant condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 10

K/A: 003 Reactor Coolant Pump A2.03
Ability to (a) predict the impacts of problems associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.

Tier: 2 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45/13

Palisades Training Objective: Predict how the following conditions will impact operation of the Primary Coolant Pumps: : PCP Motor Oil Reservoir Levels (PCP_CK13.0)

References: ARP-5, window 27, rev 65

Question:
Given the following plant conditions:

- During a power escalation the plant is at 86% power
- Primary Coolant Pump (PCP) P-50C upper reservoir oil level has lowered to 28% due to a known oil leak which has gotten worse.

What is the impact of these conditions, and how are the procedures used to mitigate the condition?

These conditions lead to ...

a. elevated winding temperatures. The Off-Normal procedure for loss of Component Cooling Water is used to provide pump trip criteria.

b. high bearing temperatures. The Alarm Response Procedure is used to provide guidance on monitoring the bearings.

c. high bearing temperatures. SOP-1, "Primary Coolant System" provides a troubleshooting guide to minimize oil leak rate.

d. pump high vibration (DANGER level). The Off-Normal procedure for rapid power reduction is used to provide plant shutdown criteria.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes low bearing oil leads to winding temperature problems, but per the ARP the concern is for high bearing temperatures.
b. **CORRECT - This upper reservoir is bearing oil. A low level will cause elevated bearing temperatures. The ARP prescribes monitoring of the temperatures.**
c. Candidate correctly interprets significance of the problem, but is incorrect in use of procedurer.
d. Candidate misinterprets significance of the problem, and is incorrect in use of procedures.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate must use knowledge of PCPs and supporting system parameters and predict the outcome (and required action) of an abnormal condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 11

K/A: 004 Chemical and Volume Control A2.27
Ability to (a) predict the impacts of improper RWST boron concentration on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.

Tier: 2 **RO Imp:** 3.5 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45/3 45/5

Palisades Training Objective: Given a directive, make up to Volume Control Tank From Safety Injection Refueling Water Tank in accordance with SOP-2A.
(CVCS_T08.00)

References: SOP-2a, 7.5.4, rev 51

Question:
Given the following conditions:

- Plant is in MODE 4 at EOL.
- SIRW Tank boron is 2420 ppm.
- Volume Control Tank (VCT) level is 67%.
- A critical approach is in progress.

If directed to raise VCT level to 75% using SIRW inventory, the NCO should ...

a. perform the evolution using SOP-2a, "Chemical and Volume Control System"

b. perform the evolution ONLY after a second SIRW Tank boron sample.

c. NOT perform the evolution since the upcoming criticality may occur at a HIGHER rod position than planned.

d. NOT perform the evolution since the upcoming criticality may occur at a LOWER rod position than planned.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes there is no concern with these plant conditions.
b. Candidate incorrectly believes that a second SIRW sample would alleviate any concerns for SIRW boron.
c. **CORRECT - SIRW boron concentration is signficantly higher than shutdown boron. This means a higher rod position than predicted to overcome boron.**
d. See item "c" above.

Cognitive Level: HIGH 2
Describe consequences or implications. Candidate must recognize an abnormal parameter (SIRW boron) and determine the implications and consequences of that condition, including whether an evolution should be performed based on those implications.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 12

K/A: 013 Engineered Safety Features Actuation G 2.1.23
Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Tier: 2 **RO Imp:** 3.9 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank Direct (1999 NRC C64)**

Applicable 10CFR55 Section: 45.2 / 45.6

Palisades Training Objective: Given plant conditions involving a CHP or CHR signal, predict the effects on operation and control of the Containment Hydrogen Monitoring System (CH2_E01.03)

References: SOP-38, Caution on page 16, rev 16

Question:
A Containment High Pressure (CHP) has occurred. The operators are attempting to determine the hydrogen concentration of containment.

What would be the effect of operating the Hydrogen Monitors in ANALYZE without taking any other actions?

a. A potential leakage path to the environment would be established.

b. An explosive mixture of hydrogen and oxygen may be created in the monitors.

c. The monitor may be damaged due to overpressure.

d. The sample pumps may be damaged due to having no flow path.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that the monitors are not rated for containment pressure following an accident, resulting in a leakage path.
b. Candidate incorrectly believes that the monitor will concentrate hydrogen to an explosive level in the monitor.
c. Candidate incorrectly believes that the monitors are not rated for containment pressure following an accident.
d. **CORRECT - The sample valves isolate on a CHP or CHR signal. Operating the pumps without first enabling the valves will cause the PD sample pumps to operate without a suction or discharge path.**

Cognitive Level: LOW
Recognition of procedural steps and cautions. Candidate must recall a caution in the procedure and recognize the basis for the caution.

K/A Match Assessment: **ADEQUATE**

References Supplied to Candidate: **None**

Question Number: 13

K/A: 017 In-core Temperature Monitor A4.01
Ability to manually operate and/or monitor actual in-core temperatures in the control room.

Tier: 2 **RO Imp:** 3.8 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 to 45.8

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution, or warning in accordance with the Emergency Operating Procedure Bases Document.
(TBAC_TBCORE_CK02.0)

References: EOP-4.0 Basis for Step 19, p.65 of 310, rev. 13

Question:
For accident conditions with NO Primary Coolant Pumps operating which of the following is the PREFERRED means of monitoring actual temperatures in the reactor core?

a. Hot Leg Temperatures since all RTDs are in the flowstream of any natural circulation that has developed.

b. Hot Leg Temperatures since the Class 1E RTDs are located closer to the actual core than are the CET thermocouples.

c. Core Exit Thermocouples (CETs) since all thermocouples are located in the flowstream of any natural circulation that has developed.

d. Core Exit Thermocouples (CETs) since they are located at the top of the core, and do not rely on loop flows.

DISTRACTOR ANALYSIS

a. Incorrectly believes Hot Leg RTDs are preferred for given conditions, even though stated location of sensing point is correct.
b. Incorrect method and for the incorrect reason. Hot Leg RTDs are not located closer to the core.
c. Selects the correct sensor, but for the wrong reason. CETs are not located in circulation flowstream.
d. **CORRECT - As prescribed by the reference.**

Cognitive Level: HIGH 2
Comprehension; recognizing relationships, how systems interact; implications. Candidate is required to demonstrate comprehension of the spatial relationships in the context of flow between installed thermocouples and the flow of the Primary Coolant System, and the resulting implications (i.e., <u>why</u> CETs are preferred method of monitoring temperatures) of this relationship

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 14

K/A: 022 Containment Cooling A3.01
Ability to monitor automatic operation of the CCS, including initiation of safeguards mode of operation.

Tier: 2 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** 3

Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.5

Palisades Training Objective: For the following Containment Cooling System major components: Containment Air Cooler Recirculation Fans V-1A/B, V-2A/B, V-3A/B, V-4A/B (CAIR_CK02.0)

References: EOP Supp 5

Question:
Given the following:

- A DBA LOCA has occurred
- ALL ESF equipment has actuated as designed

Which ONE of the following describes the expected Containment Air Cooling Fan configuration?

a. "A" fans running, "B" fans tripped, and the Service Water discharge valves from Coolers V-1, V-2 and V-3 CLOSED

b. "A" fans tripped, "B" fans running, and the Service Water inlet valves to Coolers V-1, V-2, and V-3 OPEN

c. "A" fans tripped, "B" fans running, and the Service Water discharge valve from Cooler V-4 OPEN

d. "A" fans running, "B" fans tripped, and the Service Water inlet valve to Cooler V-4 CLOSED

DISTRACTOR ANALYSIS

a. The fan response is correct, but the valves response is actually backward from correct (see "d").
b. Incorrect fan response, correct valve response.
c. Incorrect fan response, incorrect valve response.
d. **CORRECT - Correct fan and valve response.**

Cognitive Level: LOW
Recall specific facts; setpoints (in the context of automatic actuation). Candidate is required to KNOW the design response of the system for the listed ESFAS actuation.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 15

K/A: 056 Condensate A2.04
Ability to (a) predict the impacts of the loss of condensate pumps on the Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions.

Tier: 2 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.13

Palisades Training Objective: Describe the design features and interlocks that provide the following Main Condenser, Condensate and Feedwater system functions: Condensate minimum flow (CDFW_CK09.0)

References: GKatt Memo dated 2/3/98 (accessed via Lesson Plan CDFW, rev 0)
ARP-1, window 55, ONP-3, Rev 18

Question:
Given the following conditions:

- The Plant is at 30% power during a power escalation.
- BOTH Condensate Pumps are in service.
- ONE Main Feedwater Pump is in service.
- One of the operating Condensate Pumps trips.

Which of the following describes the impact on the Condensate System Recirculation Valve (CV-0730), and what must the operator do?

CV-0730 will throttle in the ...

a. OPEN direction and direct more flow to feedwater trains. Monitor Heater Drain Pumps for normal operation.

b. OPEN direction and direct more flow to the Main Condenser Hotwell. Align alternate Gland Seal Exhauster to maintain vacuum.

c. CLOSED direction and direct more flow to feedwater trains. Monitor Heater Drain Pumps for normal operation.

d. CLOSED direction and direct more flow to the Main Condenser Hotwell. Align alternate cooling to Air Ejector Condenser to maintain vacuum.

DISTRACTOR ANALYSIS

a. Since the valve is designed to maintain ~5800 gpm through the system, and that flow has been signficantly reduced due to the pump trip, CV-0730 will actually CLOSE and attempt to maintain 5800 gpm.
b. See "a".
c. **CORRECT - See "a".**
d. CV-0730 closing actually directs more flow through the feedwater trains by shutting down on flow to condenser hotwell.

Cognitive Level: HIGH 2
Rephrasing information; consequences or implications. Candidate must comprehend the implications and consequences on the entire Condensate System, given plant condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 16

K/A: 059 Main Feedwater K4.19
Knowledge of MFW design feature(s) and/or interlock(s) which provide for automatic feedwater isolation of MFW.

Tier: 2 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Describe the design features and interlocks that provide the following Main Condenser, Condensate and Feedwater system functions: Automatic Feedwater Isolation(CDFW_CK09.0)

References: ARP-5, window 70, rev 65 FSAR 7.5.1.3

Question:
Which of the following describes the operation and purpose of the Main Feed Regulating Bypass Valve "auto closure on low S/G pressure" key switch?

a. "ENABLE" allows an operator to open the bypass valve on a low S/G pressure to allow feeding the steam generators with the condensate pumps.

b. "DEFEAT" allows an operator to open the bypass valve on a low S/G pressure to allow feeding the steam generators with the condensate pumps.

c. "DEFEAT" ensures that the valve is closed on a low S/G pressure.

d. "ENABLE" ensures that the valve is open on a low S/G pressure.

DISTRACTOR ANALYSIS

a. Candidate misinterprets term "ENABLE" by believing it allows the bypass valve to be opened, when in reality "ENABLE" arms the valve to be closed on low S/G pressure.
b. **CORRECT - DEFEAT means to defeat the auto closure on low S/G pressure. These valves would be need open if feeding with Condensate Pumps.**
c. Candidate misapplies "DEFEAT" function; see "b".
d. Candidate misapplies "ENABLE" function; see "b".

Cognitive Level: LOW
Recall specific facts. Candidate must recall knowledge of a design feature of the Main Feedwater System isolation function.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 17

K/A: 061 Auxiliary/Emergency Feedwater G 2.2.22
Knowledge of limiting conditions for operations and safety limits.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** 4

Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 43.2 / 45.2

Palisades Training Objective: Given plant conditions and Technical Specifications, determine required Technical Specification actions for the Auxiliary Feedwater System, in accordance with Tech Spec 3.3.3, 3.3.4, 3.3.7, 3.3.8, and 3.7.5.
(AFW_CK21.0)

References: PROVIDE Tech. Spec. 3.7.5, Amendment 200; 3.7.6, Amendment 189 SOP-12, 4.7.b

Question:
For the Auxiliary Feedwater System, which one of the following conditions requires entry into a Technical Specification Limiting Condition of Operation (LCO)? (Assume MODE 1 conditions.)

a. T-2, Condensate Storage Tank, inventory is 63,500 gallons, and T-81, Primary Makeup Water, is 41,000 gallons.

b. FIC-0737A has been selected to AUTO.

c. P-8B and P-8C are the only operable Aux. Feedwater Pumps.

d. P-8C control handswitch HS-P-8C has been selected to the MANUAL position for 3 hours for surveillance testing.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that less than 100,000 gallons in T-2 alone requires TS entry. Actually, it is the combined inventory of T-2 AND T-81 that must be greater than 100,000 gallons to satisfy TS.
b. There are certain restrictions on flow controller operation and operability; but candidate misapplies it here, since FIC-0737A still operable in auto.
c. **CORRECT - If P-8B is not operable, TS LCO entry is required, since P-8B is required to be operable anytime the reactor is critical.**
d. Two AFW pumps may be in manual for testing up to 4 hours, without LCO entry.

Cognitive Level: LOW
Knowledge of procedural steps. Candidate must recognize a condition which requires the use or entry of a procedure step (specifically, Technical Specification entry.)

K/A Match Assessment: **GOOD**

References Supplied to Candidate: Tech. Spec. 3.7.5, 3.7.6

Question Number: 18

K/A: 071 Waste Gas Disposal K4.06
Knowledge of design features and/or interlocks which provide for sampling and monitoring of waste gas release tanks.

Tier: 2 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45.5

Palisades Training Objective: Given references, describe the modes of operation, and if applicable, interlocks/trips for the following equipment in accordance with P&IDs, SOPs, and ARPs:
* Waste Gas Decay Tank Inlet and Outlet Valves
* Waste Gas Decay Tanks Discharge Valve (CV-1123) (ISEE_CK09.0)

References: SOP-18A, 4.2.1, 7.8, rev 33

Question:
Which of the following describes the process for providing sample flow for a Waste Gas Decay Tank? (Assume normal plant conditions.)

a. Sampling is performed at four different pressures during the fill. Sample flow is provided by OPENING a manual air valve, which OPENS the sample valve.

b. Sampling is performed at two different pressures during the fill. Sample flow is provided by CLOSING a manual air valve, which OPENS the sample valve.

c. As the tank fills, sampling is performed CONTINUOUSLY. Sample flow is provided by CLOSING a manual air valve, which OPENS the sample valve.

d. The tank is sampled once when it is full (isolated at 95 psi). Sample flow is provided by OPENING a manual air valve, which OPENS the sample valve.

DISTRACTOR ANALYSIS

a. **CORRECT - The system operating procedure prescribes 4 sampling intervals. Sample valves are air operated. Isolating air closes the valve.**
b. Candidate believes sampling is done more than once, though the number is incorrect; incorrectly identifies valve operation method.
c. Candidate believes sampling is done more than once, though the number is incorrect; incorrectly identifies valve operation method.
d. Candidate correctly identifies valve operating method, but incorrectly believes tank is only sampled once (when it is full).

Cognitive Level: LOW
Recall specific facts. Candidate must recall how details of the waste gas tanks sampling process, and design features of the sample valves.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 19

K/A: 002 Reactor Coolant K5.10
Knowledge of the operational implications of the relationship between reactor power and RCS differential temperature.

Tier: 2 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45.7

Palisades Training Objective: Compare and contrast the effects on ASI of changing reactor power under the following conditions:
* BOL vs. EOL * Rapid vs. slow rate of change of power
* Larger vs. smaller power level changes * Using control rods vs. boron (IOTA_E16.01)

References: EM-04-17, Attachment 1, rev 20 FSAR Figure 4-9, rev 21

Question:
How can knowledge of the relationship between reactor power and PCS differential temperature (Thot - Tcold) be used to predict the effects on the Axial Shape Index (ASI) for a plant downpower? (Assume plant at Middle of Life.)

During the downpower, the temperature at the TOP of the core lowers...

a. MORE than the temperature at the bottom of the core. ASI becomes more POSITIVE as power moves toward BOTTOM of the core.

b. MORE than the temperature at the bottom of the core. ASI becomes more NEGATIVE as power moves toward TOP of the core.

c. LESS than the temperature at the bottom of the core. ASI becomes more NEGATIVE as power moves toward TOP of the core.

d. LESS than the temperature at the bottom of the core. ASI becomes more POSITIVE as power moves toward BOTTOM of the core.

DISTRACTOR ANALYSIS

a. Candidate correctly identifies deltaT response, but misinterprets/misapplies the effects of that.
b. **CORRECT - Since the differential temperature change is more pronounced at the top of the core, the result is a relative rise in reactivity, shifting power to top of core, and resulting more negative ASI.**
c. Candidate incorrectly identifies deltaT response; correctly identifies ASI response, but for the wrong reason.
d. Candidate incorrectly identifies deltaT response, and arrives at the incorrect ASI response.

Cognitive Level: HIGH 2
Recognizing relationships, showing similarities and differences among parts or wholes. Candidate must apply knowledge of the relationship between reactor power and PCS differential temperature to predict an outcome (i.e., effect on Axial Shape Index.)

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 20

K/A: 012 Reactor Protection K2.01
Knowledge of bus power supplies to RPS channels, components, and interconnections.

Tier: 2 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **2**
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank Direct (2000 NRC C20)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: List the power supplies for the following Reactor Protective System components: Channels A, B, C, and D
in accordance with DBD 2.05.
(RPS_CK07.0)

References: ONP-24.2, rev 21 ONP-24.3, rev 20

Question:
Which of the following are the power supplies for the Reactor Protection System BC logic matrix?

a. Y-10 and Y-30

b. Y-10 and Y-40

c. Y-20 and Y-30

d. Y-20 and Y-40

DISTRACTOR ANALYSIS

a. This combination supplies AC matrix.
b. This combination supplies AD matrix.
c. **CORRECT - Y-20 supplies Channel 'B' and Y-30 supplies Channel 'C'.**
d. This combination supplies BD matrix.

Cognitive Level: LOW
Recall specific facts. Candidate must recall the power supplies for RPS components.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 21

K/A: 016 Non-nuclear instrumentation K5.01
Knowledge of the operational implications of the separation of control and protection circuits as it applies to the NNIS.

Tier: 2 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45. 7

Palisades Training Objective: Given a directive, bypass or remove from bypass a Reactor Protective System trip unit in accordance with SOP-36.
(RPS_T06.00)

References: ARP-5, window 61, rev 65; FSAR 7.2 page 7.2-2, 7.2-8, 9, 7.5-8, 9

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

Refer to the attached graphic of Steam Generator level instrumentation.

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

a. LI-0751A fails LOW.

b. LI-0751A fails HIGH.

c. LIA-0702 fails LOW.

d. LIA-0702 fails HIGH.

DISTRACTOR ANALYSIS

a. This instrument is part of the reactor protection circuitry; however if it fails low, the reactor will NOT trip since two low level signals must be sensed. The bypassed channel does not affect the requirement for two channels sensing low level.
b. This instrument is part of ther reactor protection circuitry; however failing high would not cause a reactor trip.
c. This instrument is part of the control circuitry for steam generator water level (high level override). Failing low would not result in or lead to a reactor trip.
d. **CORRECT - This instrument is part of the steam generator water level (high level override) control circuit. If the instrument fails high, the feedwater regulating valves will close down to prevent a high level. With no operator action, LOW steam generator levels will result in a trip.**

Cognitive Level: HIGH 2
Rephrasing information; recognizing relationships. Candidate must apply knowledge and comprehension of the difference between control circuits and protection circuits for Steam Generator Water Level Control, along with knowledge of the function and design of each type of circuit and then finally, demonstrate comprehension of the operational implication (i.e., reactor trip) of the given condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: Panel Graphic of Steam Generator level instruments (attached)

Question Number: 22

K/A: 029 Containment Purge G 2.1.2
Knowledge of operator responsibilities during all modes of plant operation.

Tier: 2 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given a directive, purge the containment building in accordance with SOP-24.

(PVT_T02.00)

References: SOP-24, 7.2.2, rev 36

Question:
The plant is in MODE 3 and a Containment Purge is to be performed.

Consider the following equipment:

1. V-46, Air Room Purge Supply Fan
2. CV-1805, 1806, 1807, 1808, Containment Purge Exhaust Valves
3. T-64D, Clean Waste Receiver Tank

Which of the following describes operational restrictions for performing this Containment Purge?

a. V-46 can be used ONLY if the Containment Purge Exhaust Valves are OPEN in order to prevent pressurizing containment.

b. V-46 operation is NOT allowed, but the Containment Purge Exhaust Valves must be OPEN to completely purge containment.

c. Containment Purge Exhaust Valves must be locked CLOSED, and purge flow is via T-64D removed rupture disk. V-46 operation is NOT allowed.

d. Containment Purge Exhaust Valves must be locked CLOSED. V-46 is operated to provide adequate purge flow via T-64D removed rupture disk.

DISTRACTOR ANALYSIS

a. Procedural restrictions prevent the use of Fan V-46.
b. Plant mode prevents the use of the Purge Exhaust Valves.
c. **CORRECT - All restrictions are correct, per the operating procedure.**
d. Candidate correctly identifies that Purge Exhaust valves cannot be used, but fails to realize that V-46 cannot be used, and further; misapplies system knowledge regarding the function of V-46.

Cognitive Level: HIGH 2
How systems interact. Candidate must comprehend the implications of the relationship between HVAC equipment and the containment purge evolution. This question also tests comprehension of the importance of a high degree of sensitivity to containment integrity.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 23

K/A: 039 Main and Reheat Steam A4.04
Ability to manually operate and/or monitor in the control room emergency feedwater pump turbines.

Tier: 2 **RO Imp:** 3.8 **RO Exam:** Yes **Difficulty:** 3

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.7 / 45.5 to 45.8

Palisades Training Objective: For the Auxiliary Feedwater System:
* List the Control Room indications
* Describe the Control Room controls (AFW_CK08.0)

References: SOP-12, 7.2.5, rev 42 ARP-36, #3-8, rev 4

Question:
What indication is available in the Control Room for a low suction pressure trip of the turbine driven Auxiliary Feedwater Pump P-8B, and what operation is required for resetting the trip? (For resetting, assume that the low suction pressure condition has been corrected.)

a. A shared alarm with P-8A provides indication of low suction pressure condition. Reset by taking HS-0522B to OPEN.

b. AMBER light above HS-0522B will illuminate to indicate low suction pressure condition. Reset by taking HS-0552B to CLOSE.

c. AMBER light above HS-0522B will illuminate to indicate low suction pressure condition. Reset by taking HS-0522B to OPEN.

d. A shared alarm with P-8A provides indication of low suction pressure condition. Reset by taking HS-0522B to CLOSE.

DISTRACTOR ANALYSIS

a. Candidate correctly identifies alarm function, but does not understand how to reset low suction.
b. There is an AMBER light above the handswitch, but it indicates AUTO mode for pump start.
c. There is an AMBER light above the handswitch, but it indicates AUTO mode for pump start.
d. **CORRECT - This is the function of the alarm; the low suction relay actuation is reset by taking the HS to close.**

Cognitive Level: LOW
Recall of discrete bits of information. Candidate is tested on knowledge of design features that are useful in monitoring the steam driven auxiliary feedwater pump operation.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 24

K/A: 062 AC Electrical Distribution K3.01
Knowledge of the effect that a loss or malfunction of the ac distribution system will have on major system loads.

Tier: 2 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct) Prac2(RO66)**

Applicable 10CFR55 Section: 41.7 / 45.6

Palisades Training Objective: Predict how the following conditions will impact operation of the Electrical Distribution system:
* Bus undervoltage * Bus overcurrent
* Transformer deluge operation * Transformer sudden pressure (SPS_CK13.0)

References: ARP-2, window 31, rev 41

Question:
Given the following conditions:

- The plant is operating at 60% power.
- EK-0331, MAIN TRANSFORMER SUDDEN PRESS, alarms.
- All plant components/systems respond as expected.

The Main Transformer deluge actuates and ...

a. the plant remains at power. 4160 VAC Buses 1A and 1B fast transfer to Startup Transformers 1-1 and 1-3, respectively.

b. the plant trips. 4160 VAC Buses 1A and 1B fast transfer to Startup Transformer 1-1 and 1-3.

c. the plant remains at power. 2400 VAC Safeguards Buses Bus 1C and 1D deenergize and are repowered by the Diesel Generators.

d. the plant trips. 2400 VAC Safeguards Buses Bus 1C and 1D fast transfer to Startup Transformer 1-2.

DISTRACTOR ANALYSIS

a. The plant will actually trip due to a lockout relay actuation.
b. **CORRECT - The sudden pressure relay actuation actuates a lockout relay (386P) which trips the main generator and the plant.**
c. These buses are normally powered from Safeguards Transformer 1-1 and will remain so.
d. These buses are normally powered from Safeguards Transformer 1-1 and will remain so. They do not fast transfer for the given conditions.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate is given a set of conditions, a malfunction, and then required to apply knowledge to predict the outcome.

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 25

K/A: 086 Fire ProtectionA2.01
Ability to (a) predict the impacts of manual shutdown of the FPS on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of that operation.

Tier: 2 **RO Imp:** 2.9 **RO Exam:** Yes **Difficulty:** **3**
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.13

Palisades Training Objective: For automatic actuations associated with the Fire Protection System:
* state the parameter and value (setpoint) at which the automatic actions occurs
* explain the purpose of each automatic actuation

in accordance with SOP-21, ARP-7, ARP-12, ARP-23, ARP-24.
(FPS_CK10.0)

References: EK-1135, EK-1134

Question:
Given the following plant conditions:

- The plant is at 40% power.
- No equipment is out of service.
- Due to a miscommunciation, the Auxiliary Operator manually shuts off P-13 Fire Jockey Pump.

Assuming all equipment functions per design, what is the expected impact of this action on the Fire Protection System, and which procedure should be referred to by the operator?

a. NO automatic action occurs. Operator refers to EK-1135, "FIRE SYSTEM HEADER LO PRESS" for required actions.

b. NO automatic action occurs. Operator refers to SOP-21, Fire Protection System for manually starting P-9B Diesel Fire Pump.

c. P-9A Motor Driven Fire Pump auto starts. Operator refers to EK-1134, "MOTOR DRIVEN FIRE PUMP RUNNING" for required actions.

d. P-41 Diesel Fire Pump auto starts. Operator refers to EK-1140, "DIESEL FIRE PUMP RUNNING" for required actions.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes no pump auto starts, but P-9A will start on low header pressure.
b. Candidate incorrectly believes no pump auto starts, but P-9A will start on low header pressure.
c. **CORRECT - Shutting off the jockey pump causes system pressure to degrade.**
d. P-9A will start at 98 psig and maintain system pressure.

Cognitive Level: HIGH 3
Describe consequences or implications. Candidate is given a situation and must apply knowledge of the Fire Protection System to predict the impacts on the system.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**
Question Number: 1

K/A: 000011 Large Break LOCA / 3 A2.07

Ability to determine or interpret that equipment necessary for functioning of critical pump water seals is operable as it applies to a Large Break LOCA.

Tier: 1 **RO Imp:** n/a **RO Exam:** No
Difficulty: **4**
Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given references, describe the Technical Specifications bases for the Component Cooling Water System in accordance with Technical Specification 3.7.7. (SRO Only)

(CCW_CK22.0)

References: M-209, sh.2 SOP-3, Attachment 4, 2.0.3, rev 52 SOP-3, Attachment 10, page 13, rev 52
ARP-7, window 55 and 56, rev 64 Tech Spec Basis for 3.5.2, Background

Question:
To ensure that in the event of a Large Break LOCA the Low Pressure Safety Injection Pump P-67A bearings and seals will be cooled adequately, which of the following is true for the valves listed below?

- CV-0913, CCW Inlet to Safeguards
- CV-0950, CCW Outlet from Safeguards

These valves are normally maintained ...

a. CLOSED to prevent seal leakage when pump is idle, but automatically open on a SIAS.

b. CLOSED to reduce the potential for draining CCW to the lake, but automatically open on a SIAS.

c. OPEN due to single failure criteria concerns, even though they receive an open signal on a SIAS.

d. OPEN because they do NOT receive an open signal on a SIAS.

DISTRACTOR ANALYSIS

a. Seal leakage sounds like a real concern, but candidate misapplies it here.
b. For certain conditions this is a concern, and is even listed in the procedure; however, candidate misapplies it here.
c. **CORRECT - Though not original plant design, this was deemed to be a prudent feature.**
d. Candidate incorrectly believes these valves are not affected by an SIAS.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 2

K/A: 000029 Anticipated Transient w/o Scram / 1 A2.08
Ability to determine or interpret rod bank step counters and RPI as they apply to a ATWS.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 1 **SRO Imp:** 3.5 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Describe the operational design of each of the following Control Rod Drive System major components: (CRD_E02.02)
* Primary Position Indication
* Secondary Position Indication
* Control Rod Matrix
in accordance with the FSAR.

References: DBD-2.05, page 37 of 129, rev 3

Question:
Which of the following describes the design basis of the ATWS circuitry and its interface with the rod position indicating system?

a. Circuitry designed to provide a completely independent trip from the RPS, therefore the Plant Process Computer rod position indication must be used, since ATWS actuation does not affect LED display on panel C-02.

b. Circuitry is designed to provide a completely independent trip from the RPS. ATWS actuation will cause LED display on panel C-02 to change from 131" to 0".

c. Circuitry design does not require it to provide a completely independent trip from the RPS. ATWS actuation affects rod position indication exactly the same as an RPS trip.

d. Circuitry is designed to provide a completely independent trip from the RPS. ATWS actuation will cause Plant Process Computer rod position indication to change from 0" to 131".

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that ATWS does not affect LED display, when in reality a reactor trip due to an ATWS, or any condition, will be indicated on the rod position LED display.
b. **CORRECT - A reactor trip due to an ATWS, or any condition, will be indicated on the rod position LED display.**
c. Candidate incorrectly believes that ATWS design does not require it to be independent from RPS.
d. Candidate is correct that ATWS is independent from RPS, but interpretation of the interface with rod position indication is incorrect.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 3

K/A: 000029 Anticipated Transient w/o Scram / 1 G 2.1.2
Knowledge of operator responsibilities during all modes of plant operation.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.12

Palisades Training Objective: Given the plant at power, evaluate plant conditions and trip or recommend tripping/shutting down the Reactor when warranted in accordance with AP-4.14, Conduct Of Operations, and in use ARPs and ONPs.
(IOTF1_T15.00)

References: AP 4.14, rev 0

Question:
Given the following conditions:

- The plant is at full power.
- There are TWO licensed operators in the Control Room, one NCO, and the Control Room Supervisor.
- The Turbine NCO is in the restroom.
- The Shift Engineer is in the Tech. Support Center.
- The Main Turbine and Generator spuriously trip.
- The Reactor does NOT automatically trip.
- The Reactor NCO has a seizure and is rendered unable to function as a licensed operator.

As the Control Room Supervisor, what is your required action, and what procedure specifies this action?

a. Contact the Turbine NCO to manually trip the Reactor, as required by Admin Proc. 4.00, "Operations Organization, Responsibilities, and Conduct".

b. You must manually trip the Reactor, as required by Admin Proc. 4.14, "Conduct of Operations".

c. Contact the Shift Engineer to call out the EMTs, and then manually trip the Reactor, as required by Admin Proc. 4.14, "Conduct of Operations"

d. You must manually trip the Reactor, as required by Admin Proc. 4.02, "Control of Equipment."

DISTRACTOR ANALYSIS

a. Candidate misapplies requirements of either the union contract, or of the procedure guidance.
b. **CORRECT - Per the procedure listed the SRO is required to trip the reactor.**
c. Candidate misapplies the procedure guidance. While medical attention is important, this sequence is not specified by any procedure.
d. Correct action, but incorrect procedure.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 4

K/A: 000055 Station Blackout / 6 A2.06
Ability to determine or interpret faults and lockouts that must be cleared prior to re-energizing buses as they apply to a Station Blackout.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4
Group: 1 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: EOP-3.0 EOP Supplements as mentioned in question

Question:
A Station Blackout has occurred. As the Control Room Supervisor, how do you use the procedures to determine which relays should be checked in order to help you evaluate which power source to restore first?

a. Use SOP-32, "345KV Switchyard" for an attachment which lists all Switchyard relays and expected status of those relays for a Station Blackout event.

b. EOP Supplement 28, "Supplementary Actions for Loss of Power" will direct you to use EOP Supplement 22, "Switchyard Relay/Target List".

c. EOP Supplement 21, "Restoration of 'F' or 'R' Buses" will direct you to use EOP Supplement 22, "Switchyard Relay/Target List".

d. At Step 16 of EOP-3.0, "Station Blackout Recovery" you will be directed to use EOP Supplement 29, "Restore Buses 1C, 1D, 1E Power from Off-Site Source".

DISTRACTOR ANALYSIS

a. Candidate incorrectly assumes by virtue of the procedure title that it contains the needed guidance. However, SOP-32 is primarily directed towards routine activities and not specific to troubleshooting.
b. Candidate incorrectly assumes by virture of the procedure title that it contains the needed guidance. However, this procedure has very little to do with the electrical system, and is primarily compensatory actions for equipment which had lost power.
c. **CORRECT - These two supplements are used together for the required actions.**
d. Candidate incorrectly assumes by virture of the procedure title that it contains needed guidance, but also incorrectly applies procedure intent. This procedure is used after an offsite power source is restored.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 5

K/A: 000055 Station Blackout / 6 G 2.4.6
Knowledge of symptom based EOP mitigation strategies.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 1 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.11

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: EOP-9.0, RC-1,2,3, MVAE-AC-1

Question:
A Station Blackout has occurred concurrent with THREE stuck rods. Both Diesel Generators are running and have failed to automatically load. Both Steam Generator levels are at approximately -10% and lowering with NO Auxiliary Feedwater flow.

Which one of the following describes the required sequence of mitigation strategy?

a. **Sequential Actions:**
1. Open RPS breakers 42-1 and 42-2.
2. Close D/G output breakers.
3. Start P-8B Auxiliary Feedwater Pump.

b. **Sequential Actions:**
1. Start P-8B Auxiliary Feedwater Pump.
2. Close D/G output breakers.
3. Open RPS breakers 42-1 and 42-2.

c. **Sequential Actions:**
1. Open RPS breakers 42-1 and 42-2.
2. Start P-8B Auxiliary Feedwater Pump.
3. Close D/G output breakers.

d. **Sequential Actions:**
1. Close D/G output breakers.
2. Start P-8B Auxiliary Feedwater Pump.
3. Open RPS breakers 42-1 and 42-2.

DISTRACTOR ANALYSIS

a. **CORRECT - Candidate correctly identifies the action associated with the correct priority safety function.**
b. Incorrect sequence and assessment of safety function hierarchy.
c. Incorrect sequence and assessment of safety function hierarchy.
d. Incorrect sequence and assessment of safety function hierarchy.

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 6

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4 A2.04
Ability to determine or interpret the relationship between RCS temperature and main steam pressure as it applies to a Inadequate Core Cooling.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 1 **SRO Imp:** 4.2 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given plant conditions, remove Primary Coolant System Voids IAW EOP Supplement 26. (TBAC_T01.00)

References: EOP-4.0 Basis, page 278 of 310, rev 13 EOP Supplement 26

Question:
Given the following conditions:

- The plant is operating at 100% power.
- A small break LOCA occurs inside containment.
- EOP-4.0, "Loss of Coolant Accident Recovery" is being implemented.
- Reactor Vessel Level Monitoring System (RVLMS) has ALL red lights LIT for both channels.

If this condition worsens, how will Primary Coolant System temperature and Main Steam pressure respond, and what action is required to address the condition?

a. As CETs continue to indicate saturated conditions, main steam pressure will LOWER due to code safety operation. Transition from EOP-4.0, to EOP-9.0, "Functional Recovery Procedure."

b. CETs will rapidly rise to indicate superheated conditions, main steam pressure will RISE. Transition from EOP-4.0, to EOP-9.0, "Functional Recovery Procedure."

c. CETs will rapidly rise to indicate superheated conditions, main steam pressure will RISE. Remain in EOP-4.0 and implement EOP Supplement 26, "PCS Void Removal".

d. As CETs continue to indicate saturated conditions, main steam pressure continues to RISE. Remain in EOP-4.0 and implement EOP Supplement 20, "Hot Leg Injection Via PZR".

DISTRACTOR ANALYSIS

a. Incorrect assessment of plant conditions; incorrect procedural transition.
b. Candidate incorrectly believes the functional recovery procedure should be used.
c. **CORRECT - Optimal procedure in conjunction with specific guidance for void removal is the required procedure usage.**
d. Incorrect assessment of plant conditions, incorrect procedure usage.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 7

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4 G 2.1.30
Ability to locate and operate components, including local controls.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: ONP-25.2, step 19, rev 18

Question:
Given the following conditions:

- The reactor has been manually tripped due to a small break LOCA.
- The operating crew has just begun carrying out the Immediate Actions of EOP-1.0, "Standard Post-Trip Actions".
- A fire is reported in Cable Spreading Room and large amounts of smoke and noxious fumes are entering the Control Room.
- Pressurizer pressure is 1300 psia and lowering and NO Safety Injection equipment has actuated, and cannot be actuated manually.
- You have issued the order to evacuate the Control Room.

To ensure safety injection flow to the core, you need to dispatch ...

a. ONE operator to Bus 1D to manually start LPSI P-67A and open at least one loop injection MOV with local switch.

b. ONE operator to Bus 1C to manually start LPSI P-67B and open at least one loop injection MOV with local switch.

c. TWO operators; ONE to Bus 1D to manually start HPSI P-66A and ONE to Panel C-150A to open at least one loop injection valve with local switch.

d. TWO operators; ONE to Bus 1C to manually start HPSI P-66B and ONE to Panel C-33 to open at least one loop injection valve with local switch.

DISTRACTOR ANALYSIS

a. Inadequate operators; incorrect pump to be started. At this pressure, no flow would be delivered.
b. Inadequate operators; incorrect pump to be started. At this pressure, no flow would be delivered.
c. Correct number of needed operators, but locations are incorrect. There are no loop injection valve controls at C-150, and Bus 1D is the opposite bus than what is required for the pump listed.
d. **CORRECT - A HPSI pump is the correct pump for the conditions, correct bus for listed pump, and loop injection valve control location is correct.**

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 8

K/A: 000076 High Reactor Coolant Activity / 9 G 2.1.28
Knowledge of the purpose and function of major system components and controls.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Describe the Technical Specification bases for the Primary Coolant System, in accordance with Technical Specifications 3.4.16. (SRO ONLY)
(PCS_CK22.0)

References: Tech Spec 3.4.16 Applicability Basis

Question:
Which of the following describes the Technical Specification applicability for PCS Specific Activity, including the basis?

This Technical Specification is applicable in ...

a. MODES 1, 2, and 3 with Tave $\geq$ 300ºF based on the lift settings for the ADVs and the Turbine Bypass Valve.

b. MODES 1, 2, and 3 with Tave $\geq$ 500ºF based on the lift settings for the ADVs and the main steam safety valves.

c. MODES 1, 2, 3, and 4 with Tave $\geq$ 500ºF based on the analyzed failure mode of the ADV and Turbine Bypass Valve controller.

d. MODES 1, 2, and 3 with Tave $\geq$ 300ºF based on the lift settings for the ADVs and the main steam safety valves.

DISTRACTOR ANALYSIS

a. Correct mode, but incorrect temperature and incorrect basis.
b. **CORRECT - Correct mode, temperature, and basis.**
c. Incorrect mode, correct temperature, incorrect basis.
d. Correct mode, incorrect temperature, correct basis.

Cognitive Level: HIGH 3

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 9

K/A: 000007 (BW/E02&E10; CE/E02) Reactor Trip -Stabilization-Recovery / 1 A2.06
Ability to determine or interpret occurrence of a reactor trip as it applies to a reactor trip.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 2 **SRO Imp:** 4.5 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: Given a scenario involving a reactor trip, determine if the event should be classified as a Condition 1 or 2 in accordance with AP 4.08. (SRO Only) (APCO_E08.03)

References: AP 4.08, 5.3.4, a, rev 5

Question:
Given the following:

- The plant is at full power.
- Testing of the Main Turbine Protective Trips is in progress.
- The operator at the front pedestal inadvertently causes the Main Turbine to trip, and immediately notifies the Control Room of what happened.
- All plant equipment functions as designed.

Which of the following is the correct Trip Classification of this event, and what procedures will be implemented?

a. Implement EOP-1.0, "Standard Post Trip Actions", and then EOP-2.0, "Reactor Trip Recovery". This is a Condition I trip, and does NOT require a PRC review prior to restart.

b. Implement EOP-1.0, "Standard Post Trip Actions", and then EOP-9.0, "Functional Recovery Procedure". This is a Condition II trip, and DOES require a PRC review prior to restart.

c. Implement EOP-2.0, "Reactor Trip Recovery", and then EOP-9.0, "Functional Recovery Procedure". This is a Condition I trip, and does NOT require a PRC review prior to restart.

d. Implement EOP-1.0, "Standard Post Trip Actions", and then EOP-2.0, "Reactor Trip Recovery". This is a Condition II trip, and DOES require a PRC review prior to restart.

DISTRACTOR ANALYSIS

a. **CORRECT - Correct procedure use, correct trip classification and requirement for restart.**
b. Correct procedure initially, but incorrect transition, incorrect trip classification, but correct subsequent authorization.
c. Incorrert initial procedure use, correct trip classification, and subsequent authorization.
d. Correct procedure use, incorrect trip classification and subsequent authorization.

Cognitive Level: HIGH 3

K/A Match Assessment: GOOD

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 10

K/A: 000022 Loss of Reactor Coolant Makeup / 2 G 2.4.30
Knowledge of which events related to system operations/status should be reported to outside agencies.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 2 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.11

Palisades Training Objective: Given procedure AP-4.00 and AP-3.03, determine the non-emergency events that require notification. (SRO only)
APOR_E01.03

References: TS 3.5.1, Action A, C TS 3.5.2, Action A ORM 3.2

Question:
For full power plant conditions, which one of the following conditions affecting the ability to makeup to the Primary Coolant System requires notification to the Nuclear Regulatory Commission?

a. Charging Pump P-55B is inoperable and will be restored in 4 days.

b. LPSI P-67A is inoperable and will be restored in 60 hours.

c. Safety Injection Tank T-82A pressure is 180 psig and lowering. It will be restored to normal in 4 days.

d. Boric Acid Pump P-56A spuriously started and was manually stopped. Repairs will require 68 hours.

DISTRACTOR ANALYSIS

a. There are no Tech Specs for the CVCS equipment.
b. Candidate incorrectly assesses the Tech Spec implications of this condition and believes that a plant shutdown is required, or that NRC notification is required. The associated LCO is 7 days.
c. **CORRECT - The associated LCO has been exceeded and since a plant shutdown is now required, notification to the NRC is required (4 hour reportable).**
d. Candidate incorrectly believes this was a safeguards equipment unplanned actuation.

Note: Common 42 question is somewhat similar to this one, but it is not considered a duplication, because this question focuses on knowledge of notification requirements, and not evaluating the actual condition.

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 11

K/A: 000033 Loss of Intermediate Range NI / 7 G 2.2.25
Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 2 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.2

Palisades Training Objective: Describe the Technical Specification bases for the NI System, in accordance with Technical Specifications 3.3.1. (SRO only) (CK22.0)

References: Tech Spec 3.3.1 Basis for Condition D, and Action D.1, D.2

Question:
Refer to the provided LCO 3.3.1, page 3.3.1-2.

Which of the following describes a failure of equipment that would require entry into CONDITION D, and what is the basis for the REQUIRED ACTION? (Assume APPLICABILITY conditions exist.)

a. One Source Range channel NI becomes inoperable. The Safety Analysis relies on the Source Range NIs to remove ZPM Bypass for a Continuous Rod Withdrawal.

b. The ZPM bypass key can be removed from the keyswitch in BYPASS. Affected RPS trips are bypassed for reactor protection in the event of a Control Rod Ejection.

c. One Power Range channel NI becomes inoperable. The Safety Analysis relies on the Power Range NIs to remove ZPM Bypass for a Control Rod Ejection.

d. One Wide Range channel NI becomes inoperable. The Safety Analysis relies on the Wide Range NIs to remove ZPM Bypass for a Continuous Rod Withdrawal.

DISTRACTOR ANALYSIS

a. Candidate misapplies system interrelationships, resulting in the incorrect basis.
b. Candidate exhibits incorrect system knowledge, resulting in the incorrect basis.
c. Correct basis, but for the incorrect instrument required.
d. **CORRECT - Per Tech Spec basis the Wide Range NIs are taken credit for removing any ZPM bypasses for the given event.**

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: LCO 3.3.1, page 3.3.1-2

Question Number: 12

K/A: 000038 Steam Generator Tube Rupture / 3 A2.15
Ability to determine or interpret pressure at which to maintain RCS during S/G cooldown as it applies to a SGTR.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **2**
Group: 2 **SRO Imp:** 4.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution, or warning in accordance with the Emergency Operating Procedure Bases Document.
(TBAC_TBCORE_CK02.0)

References: EOP 5.0 Basis for Step 17, rev 13

Question:
Given the following conditions:

- A Steam Generator Tube Rupture in "A" S/G has occurred.
- The actions of EOP-5.0, "Steam Generator Tube Rupture Recovery" are being implemented.
- "A" S/G has not yet been isolated.

What direction should be given concerning control of PCS pressure, what is the basis for it?

a. Within the limits of EOP Supplement 1, "Pressure Temperature Limit Curves" to minimize PCS dilution and maintain Shutdown Margin.

b. Within the limits of EOP Supplement 2, "PCS Cooldown Strategy" to reduce potential lifting of a Main Steam Code Safety valve.

c. Less than 940 psia to minimize the potential for a radiation release to the environment.

d. Greater than 940 psia to minimize PCS dilution, and maintain Shutdown Margin.

DISTRACTOR ANALYSIS

a. Incorrect application of the relationship between PCS pressure and faulted S/G pressure.
b. Incorrect procedure guidance (this supplement is not used for these conditions, but is actually used for a loss of feedwater event), and incorrect basis.
c. **CORRECT - Maintaining PCS pressure less than the lowest setting of the Main Steam Code Safeties precludes PCS pressure in the faulted S/G and potentially lifting the safety.**
d. Correct guidance, but the incorrect basis.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 13

K/A: 000058 Loss of DC Power / 6 A2.03
Ability to determine and interpret DC loads lost; impact on ability to operate and monitor plant systems as they apply to the Loss of DC Power.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4
Group: 2 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified (99NRC C83)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given off normal plant conditions, select the applicable Off Normal Procedure to mitigate the event.
(IOTF_CK03.0)

References: ONP-2.3, 6.0.1, rev 12 ARP-4, window 2, rev 56

Question:
Given the following plant conditions:

- PCS temperature is 420°F.
- LTOP System is armed in LTOP Mode.
- Charging pump P-55A is in operation.
- Letdown is in service.
- 125 VDC Panel D11-1 has deenergized due to a fault.

To address these conditions, the Control Room Supervisor will ...

a. direct the crew to reestablish Charging and Letdown flow per SOP-2A, "Chemical and Volume Control" since letdown flow automatically isolated due to loss of D-11-1.

b. implement ONP-23.1, "Primary Coolant System Leak" since RV-2006 has lifted due to closure of CV-2009 (Letdown Containment Isolation Valve), and will not reseat.

c. direct the crew to bypass the CVCS purification demineralizers due to CV-0909, Letdown Hx CCW Outlet, failing CLOSED.

d. implement ONP-23.1, "Primary Coolant System Leak" since a PORV has lifted due to loss of D-11-1.

DISTRACTOR ANALYSIS

a. This incorrect action would not address the real problem (a lifted relief valve causing a PCS leak).
b. **CORRECT - Loss of D-11-1 causes CV-2009 to close; however, letdown is still flowing from PCS into the letdown line upstream of CV-2009. In the flowpath is RV-2006 which will lift due to the higher letdown pressure.**
c. Candidate incorrectly believes that excessive letdown flow (and higher temperature) is the result of the DC loss.
d. Correct procedure, but incorrect reason and incorrect effect on plant equipment.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 14

K/A: 000065 Loss of Instrument Air / 8 G 2.4.6
Knowledge of symptom based EOP mitigation strategies.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 2 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.5 / 45.13

Palisades Training Objective: Given plant conditions requiring use of EOP 9.0 (Functional Recovery Procedure), determine the in-use Safety Function Success Paths in accordance with EOP 9.0

(TBAH_T01.00)

References: EOP-9.0, Resource Assessment Tree I, rev 16

Question:
Which one of the following describes the mitigation strategy for the Safety Function "Maintenance of Vital Auxiliaries - Air" during the performance of EOP-9.0, "Functional Recovery Procedure"?

a. There is only ONE Success Path and it requires availability of 2400 VAC safety related power.

b. There is only ONE Success Path and it does NOT require availability of 2400 VAC safety related power.

c. There are TWO Success Paths and they BOTH require availability of 2400 VAC safety related power.

d. There are TWO Success Paths and only ONE requires availability of 2400 VAC safety related power.

DISTRACTOR ANALYSIS

a. Incorrect number of Success Paths, though candidate correctly identifies the need for safety power.
b. Incorrect number of Success Paths, incorrect assessment of power requirements.
c. Correct number of Success Paths; but only Instrument Air requires safety related power.
d. **CORRECT - Correct number of Success Paths and correct assessment of power requirements. Use of Feedwater Purity Bldg. air system requires the availability of Bus 1E, non safety-related bus.**

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 15

K/A: 000036 (BW/A06) Fuel Handling Accident / 8 A2.02
Ability to determine and interpret the occurrence of a fuel handling incident as it applies to the Fuel Handling Incidents.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 3 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given off normal plant conditions, select the applicable Off Normal Procedure to mitigate the event.
(IOTF_CK03.0)

References: ONP 23.3

Question:
Given the following conditions:

- Steam Generator Nozzle Dams are installed.
- Fuel is being moved from the core to the Spent Fuel Pool.
- EK-1349 and EK-1350, Containment Sump Hi Hi Level, alarm annunciates.
- Containment Radiation Monitors, RIA-2316 and RIA-2317, indicate rising radiation levels.

Which of the following procedures has IMMEDIATE ACTIONS which must be performed for these conditions?

a. ONP-11.1, Fuel Cladding Failure

b. ONP-11.2, Fuel Handling Accident

c. ONP-17, Loss of Shutdown Cooling

d. ONP-23.3, Loss of Refueling Water Accident

DISTRACTOR ANALYSIS

a. ONP-11.1 has no Immediate Actions.
b. ONP-11.2 does have Immediate Actions, but the given plant conditions do not warrant entry.
c. ONP-17 does have Immediate Actions, but the given plant conditions do not warrant entry.
d. **CORRECT - Symptoms section of ONP-23.3 match with given plant conditions.**

Cognitive Level: HIGH 3

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 16

K/A: 001 Control Rod Drive G 2.1.33
Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **4**
Group: 1 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.2 / 43.3 / 45.3

Palisades Training Objective: Given the Technical Specifications and plant conditions, determine required Technical Specification actions for the Control Rod Drive System, in accordance with the Technical Specifications 3.1.4, 3.1.5, and 3.1.6.
(CRD_CK21.0)

References: COLR T.S. 3.1.6 SOP-6, 7.5

Question:
Which one of the following regulating rod group configurations requires entry into a Technical Specification Limiting Condition of Operation?

a. Group 1 at 90 inches
Group 2 at 5 inches
At least one action of Tech. Spec. 3.1.4, "Control Rod Alignment" applies.

b. Group 2 at 110 inches
Group 3 at 35 inches
At least one action of Tech. Spec. 3.1.6, "Regulating Rod Group Position Limits" applies.

c. Group 3 at 131 inches
Group 4 at 45 inches
At least one action of Tech. Spec. 3.1.6, "Regulating Rod Group Position Limits" applies.

d. Group 1 at 131 inches
Group 2 at 35 inches
At least one action of Tech. Spec. 3.1.5, "Shutdown and Part Length Rod Group Insertion Limits" applies.

DISTRACTOR ANALYSIS

a. Required overlap is 80 plus 12 inches, minus 0 inches. Given overlap is acceptable.
b. **CORRECT - Required overlap is exceeded because it is less than 80 inches between groups.**
c. Required overlap is 80 plus 12 inches, minus 0 inches. Given overlap is acceptable.
d. Required overlap is 80 plus 12 inches, minus 0 inches. Given overlap is acceptable.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 17

K/A: 061 Auxiliary/Emergency Feedwater G 2.4.4
Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 1 **SRO Imp:** 4.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.2 / 45.6

Palisades Training Objective: For automatic actions associated with the Auxiliary Feedwater System:

* AFAS actuation (including C-187 sensors)

State the parameter and value (setpoint) at which each automatic action occurs and explain the purpose of each automatic actuation in accordance with E-17, Sheets 21, 21A, 22. (AFW_CK10.0)

References: SOP-12, 7.3.1.a, rev 42 ARP-21, B1, rev 48

Question:
Given the following conditions:

- A plant startup is in progress with Reactor power at 1%.
- Aux. Feedwater Pump P-8C is in service.

Which one of the following conditions requires entry into either an off-normal procedure or into an emergency operating procedure?
(Consider each condition separately.)

a. P-8C discharge pressure indicates 920 psi.

b. P-8C operating amps indicates 112 amps.

c. Flow to each Steam Generator is at 90 gpm.

d. "B" Steam Generator level is at 23%.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes discharge pressure is unacceptable, when in reality, for these plant conditions Main Steam pressure is ~900 psi, and a discharge pressure slightly higher than that is not only acceptable, but required in order to develop flow.

b. Candidate is correct in believing that 112 amps is not acceptable; however, this condition does not require ONP or EOP entry, but requires operators to reduce running amps by reducing flow.

c. Candidate believes that 90 gpm is too low; however, the given conditions for plant startup means that the operators are controlling flow as needed. ONP or EOP entry is not required.

d. **CORRECT - The RPS trip setpoint for steam generator low level is 26.9%. Given conditions exceed this. Candidate should realized this means the reactor will automatically trip, which requires entry into an EOP for Standard Post Trip Actions.**

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 18

K/A: 072 Area Radiation Monitoring A3.01
Ability to monitor automatic operation of the ARM system, including changes in ventilation alignment.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4
Group: 1 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.7 / 45.5

Palisades Training Objective: Given off normal plant conditions, select the applicable Off Normal Procedure to mitigate the event.
(IOTF_CK03.0)

References: ONP-11.2

Question:
Refueling operations are in progress when the following alarm annunciates:

- EK-1364, GASEOUS WASTE MONITORING HI RADIATION

The alarm is due to a valid high alarm condition on RIA-5712, Fuel Handling Area Vent monitor.

In response to this condition, the Control Room Supervisor will use ...

a. SOP-24, "Ventilation and Air Conditioning Systems", to direct a manual shutdown of the Fuel Handling Area ventilation system.

b. ONP-11.2, "Fuel Handling Accident" which will direct verification of the automatic tripping of V-69 Supply Fan, and to direct certain manual actions.

c. SOP-38, "Gaseous Process Monitoring System" which will direct verification of the automatic tripping of V-70A and V-70B Exhaust Fans.

d. SOP-24, "Ventilation and Air Conditioning Systems" which will direct verification of the automatic tripping of only ONE of the V-70 Exhaust Fans.

DISTRACTOR ANALYSIS

a. With refueling operations in progress and a valid alarm, conditions are met for ONP entry; and though SOP-24 does contain certain actions regarding HVAC in general, it is not used for these conditions, especially since a manual shutdown of the ventilation is not the correct action.
b. **CORRECT - ONP-11.2 prescribes performance of a ventilation checklist which verifies the stated auto action.**
c. Candidate incorrectly believes this SOP contains actions regarding the listed equipment, when in fact, there is no mention of V-70A/B in this procedure.
d. Per Design Basis Document 1.07, page 124 of 197, the second V-70 exhaust fan may require to be auto started based on inlet pressure. In any case, SOP-24 is not the correct procedure for these conditions, since ONP entry conditions are met.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 19

K/A: 012 Reactor Protection A2.06
Ability to (a) predict the impacts of failure of RPS signal to trip the reactor; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of the malfunction.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **2**
Group: 2 **SRO Imp:** 4.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.5

Palisades Training Objective: Explain the design basis of the Reactor Protective System ATWS trip in accordance with DBD 2.05.
(RPS_E04.02)

References: ARP-21, Rack D5, rev 48

Question:
For a Loss of Load event, which one of the following describes the impact of a failure of the Reactor Protection System to automatically trip the reactor, and what procedure is used to mitigate the condition?
(Assume NO operator action.)

Pressurizer pressure rises to ...

a. 2235 psia and the reactor automatically trips. Implement EOP-1.0, "Standard Post Trip Actions".

b. 2235 psia and the reactor automatically trips. Implement EOP-9.0, "Functional Recovery Procedure".

c. 2375 psia and the reactor automatically trips. Implement EOP-1.0, "Standard Post Trip Actions".

d. 2375 psia and the reactor automatically trips. Implement EOP-9.0, "Functional Recovery Procedure".

DISTRACTOR ANALYSIS

a. Incorrect pressure, correct procedure.
b. Incorrect pressure, incorrect procedure. Candidate believes an ATWS warrants functional recovery entry.
c. **CORRECT - Correct pressure and procedure.**
d. Correct pressure, incorrect procedure. Candidate believes an ATWS warrants functional recovery entry.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 20

K/A: 029 Containment Purge A4.01
Ability to manually operate and/or monitor in the control room containment purge flow rate.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 2

Group: 2 **SRO Imp:** 2.5 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 to 45.8

Palisades Training Objective: Given a directive, purge the containment building in accordance with SOP-24. (PVT_T02.00)

References: SOP-24, 7.2.5, rev 36 ODCM HP 6.14 Operating Requirements Manual

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Question:
A Containment Purge is to be performed with the plant in MODE 5, using the Containment Purge Exhaust Valves, CV-1805, 1806, 1807, and 1808.

Which document is used to provide guidance for monitoring or controlling the Containment Purge, and what is required?

a. Health Physics 6.14, "Containment Purge" prescribes a purge flow rate of LESS than 100 scfm.

b. SOP-24, "Ventilation and Air Conditioning System" requires logging the times of Containment Purge Exhaust valves operation.

c. The Offsite Dose Calculation Manual allows a flow rate (up to a maximum of 100 scfm) that results in a nuclide sum fraction of < 10.0.

d. The Operating Requirements Manual requires the Containment Purge Exhaust valves to be open for NO MORE THAN a total of 30 minutes.

DISTRACTOR ANALYSIS

a. Health Physics 6.14 contains no prescribed flow rate that is directly measurable.
b. **CORRECT - The controlling parameter for a containment purge is by keeping close account (log entries) of start and stop times.**
c. ODCM contains no prescribed flow rate that is directly measurable. It does list a required nuclide sum fraction, but is a value 10 times less than mentioned here.
d. There is no time limit associated with the valves, and particularly none associated with the Operating Requirements Manual.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 21

K/A: 062 AC Electrical Distribution A4.01
Ability to manually operate and/or monitor in the control room: all breakers (including available switchyard).

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3
Group: 2 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 45.3

Palisades Training Objective: Given a directive, align 345KV Switchyard in accordance with SOP-32. (SPS_T02.00)

References: AP 4.28, 12.5.1, rev 0

Question:
Which document delineates the operational responsibilities for breaker operations in the Palisades Plant 345 KV Switchyard?

a. Admin Procedure 4.00, "Operations Organization, Responsibilities, and Conduct".

b. Admin Procedure 4.14, "Conduct of Operations".

c. Admin Procedure 4.28, "Control of Palisades Switchyard Activities".

d. SOP-30, "Station Power".

DISTRACTOR ANALYSIS

a. Candidate recalls that there are a number of operational requirements in this procedure, however, is incorrect in believing it covers switchyard breaker operations.
b. Candidate recalls that there are a number of operational requirements in this procedure, however, is incorrect in believing it covers switchyard breaker operations.
c. **CORRECT - AP 4.28 is a relatively recent procedure (Palisades switchyard responsibilities have changed) and is very specific on breaker operation responsibilities.**
d. Though there are numerous requirements regarding breaker operations in general, they do not apply to switchyard breakers, and who is responsible for them.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 22

K/A: 2.1.22 Ability to determine Mode of Operation.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Explain the following terms in accordance with TS Section 1.1:
* Mode
(APTS_E01.02)

References: GOP-3, 4.1, Attachment 1, 1.21, rev 18 Tech. Spec. Table 1.1-1

Question:
For the following conditions:

- The reactor is not critical.
- Tave is at 532ºF
- Group A and Group B Shutdown Rods are fully withdrawn.
- All part length rods are withdrawn.

Which of the following describes the resulting mode change when withdrawing the FIRST regulating rod?

This is a mode change from ...

a. MODE 3 to MODE 2 and requires authorization from the Plant Manager.

b. MODE 3 to MODE 2 and requires authorization from the Reactor Engineering Manager.

c. MODE 2 to MODE 1 and requires authorization from the Reactor Engineering Manager.

d. MODE 2 to MODE 1 and requires authorization from the Site Vice President.

DISTRACTOR ANALYSIS

a. **CORRECT - Correct mode change, with correct authorization required.**
b. Correct mode change, but authorization required is Plant Manager.
c. Incorrect mode change (Mode 1 occurs at 5% power), and incorrect authorization.
d. Incorrect mode change (Mode 1 occurs at 5% power), and incorrect authorization.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 23

K/A: 2.3.6 Knowledge of the requirements for reviewing and approving release permits.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 3 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.4 / 45.10

Palisades Training Objective: Given references, Approve Waste Discharge/Release Permits without error. (RMS_T02.00)

References: COP-31, 3.1, 5.2, Attachment 2, rev 19

Question:
During an outage, a portion of the water in the hotwell is to be released to the lake, per COP-31, "Non-Radiological Environmental Operating Procedure".

For reviewing and approving this release, the Shift Supervisor (SS) is required to ensure that the

a. batch volume has not changed, required dilution flow is met. After the release, SS forwards Discharge Authorization to the Environmental Coordinator.

b. Discharge Authorization was prepared by a qualified Chemistry Technician. Check at least ONE Dilution Water pump in service. After the release, SS forwards Discharge Authorization to the Certified Waste Treatment Plant Operator (WTPO).

c. required dilution flow is met. After the release , SS forwards Discharge Authorization to the Chemistry and Rad Services Supervisor.

d. Discharge Authorization was prepared by the Environmental Coordinator, batch volume has not changed, required dilution flow is met. After the release, SS forwards Discharge Authorization to the Certified Waste Treatment Plant Operator.

DISTRACTOR ANALYSIS

a. **CORRECT - Verification of release conditions are required. Routing of form after release completion is correct.**
b. Chemistry Technician is responsible for sampling and analysis, but not for preparing the release form.
c. One of the required verifications, but routing after the release is incorrect.
d. Incorrect preparation responsibility, correct verification of batch conditions, incorrect post release routing.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 24

K/A: 2.4.18 Knowledge of the specific bases for EOPs.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **2**

Group: 4 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution, or warning in accordance with the Emergency Operating Procedure Bases Document.
(TBAC_TBCORE_CK02.0)

References: EOP Supp 3 Basis, page 2, rev 9

Question:
Given the following conditions:

- A reactor trip has occurred due to a loss of offsite power.
- Subsequently, Startup Power has been restored to the plant.
- It is now desired to restart a Primary Coolant Pump per EOP Supplement 3, "Starting Primary Coolant Pumps".

One of the start criteria in this EOP Supplement is that the average of Qualified CETs must be at least 25ºF subcooled. The BASIS for this requirement is to prevent ...

a. emptying the Pressurizer.

b. overpressurizing the PCS.

c. pump cavitation and damage.

d. reactor head voiding.

DISTRACTOR ANALYSIS

a. Candidate correctly believes that voiding concerns may cause Pressurizer level to lower, but misapplies it here since there is a separate start criterion for Pressurizer level.
b. Candidate misapplies a concern for PCS pressure, when in reality starting a PCP will provide spray flow for pressure reduction if needed.
c. **CORRECT - Adequate subcooling ensures PCP operating requirements are met.**
d. See "a".

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 25

K/A: 2.4.40 Knowledge of the SRO's responsibilities in emergency plan implementation.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**

Group: 4 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 45.11

Palisades Training Objective: Given a reactor trip situation, from memory, perform the actions of EOP 1.0 in accordance with Operations Standards. (TBAB_T01.00)

References:

Question:
The plant is operating at full power on "A" Shift when the NCO informs the CRS of a rising Charging flow rate and lowering Pressurizer level.

- At 0113 hours the NCO informs the CRS that "A" Charging Pump is at full speed and that "B" and "C" Charging Pumps have started.
- Pressurizer level is continuing to lower.
- At 0117 hours the CRS directs a manual reactor trip.

By which one of the following times should the current emergency be classified in accordance with the Emergency Plan?

a. 0128 hours

b. 0132 hours

c. 0147 hours

d. 0213 hours

DISTRACTOR ANALYSIS

a. **CORRECT - 15 minutes is the required time interval and measured from the time entry conditions were met.**
b. Candidate correctly identifies 15 minutes, but uses the incorrect time of origin.
c. Incorrect time (30 minutes from reactor trip).
d. Incorrect time (1 hour from time of entry conditions)

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 1

K/A: 000055 Station Blackout / 6 G 2.4.49
Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Tier: 1 **RO Imp:** 4.0 **RO Exam:** Yes
Difficulty: **2**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source: NEW**

Applicable 10CFR55 Section: 41.10 / 43.2 / 45.6

Palisades Training Objective: Given a reactor trip situation, from memory, perform the actions of EOP 1.0 in accordance with Operations Standards. (TBAB_T01.00)

References: EOP-1.0, 11. b.2., rev 12

Question:
Given the following plant conditions:

- The plant was at 60% power when a Loss of All Offsite Power occurred.
- Initially NO Diesel Generator was running.
- During the performance of EOP-1.0, "Standard Post-Trip Actions" D/G 1-1 was started.
- Critical Service Water header pressure is 25 psig and stable.
- Pressurizer pressure is 1900 psia and stable.
- Safety Injection has NOT actuated.

The first action required is to CLOSE ...

a. Containment Air Cooler high capacity valves as needed.

b. CV-0847, Containment Air Cooler Supply.

c. CV-1359, Non-critical Service Water isolation.

d. Containment Air Cooler outlet bypass valves as needed.

DISTRACTOR ANALYSIS

a. **CORRECT - This provides more control over any adjustments and maintain containment cooling while providing boost to SW header pressure.**
b. Candidate correctly interprets the need to boost SW pressure, but this action would remove ALL SW cooling to containment, and is the incorrect action.
c. This action has already occurred automatically on the Safety Injection.
d. Incorrect action.

Cognitive Level: HIGH 3
Predict an event or outcome; solve a problem. Requires candidate to analyze plant conditions and diagnose what is occurring, and then to solve the problem by selecting an action that will mitigate the condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 2

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4 G 2.4.31
Knowledge of annunciators alarms and indications, and use of the response instructions.

Tier: 1 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **BANK (Direct)**

Applicable 10CFR55 Section:

Palisades Training Objective: Given plant conditions, remove Primary Coolant System Voids IAW EOP Supplement 26. (TBAC_T01.00)

References: EOP Supplement 26, and Basis

Question:
Given the following plant conditions:

- A small break loss of coolant accident has occurred.
- Both Safety Injection and Containment High Pressure have initiated.
- HPSI Pump P-66A has failed to start.
- Actual Pressurizer level is 34% and rising rapidly.
- Actual Pressurizer pressure is 1060 psia and slowly lowering.
- Average of the Qualified CETs is 560ºF and slowly lowering.
- All Primary Coolant Pumps (PCP) are stopped.
- The accident initiated 30 minutes ago.

Which one of the following describes what is occurring and a prescribed action which will mitigate the condition?

a. Steam Generator tube voiding is occurring. Start one PCP in each loop to sweep any voids from hotter areas.

b. Reactor head voiding is occurring. Raise Pressurizer pressure within procedural limits to try collapsing the void.

c. Safety Injection flow is excessive. Throttle Safety Injection to stabilize Pressurizer level.

d. Safety Injection flow is inadequate. Lower Pressurizer pressure in order to raise HPSI flow.

DISTRACTOR ANALYSIS

a. Correct interpretation of voiding indications, but for the incorrection location, and incorrect action.
b. **CORRECT - Rapidly rising Pressurizer level, combined with indicated saturation conditions, indicates reactor head voiding. Raising pressure is attempt to eliminate saturation conditions.**
c. Candidate misinterprets significance of Pressurizer level increase.
d. Correct identification of injection flow status, but incorrect corrective action.

Cognitive Level: HIGH 3
Predict an event or outcome; solve a problem. Requires candidate to analyze plant conditions and diagnose what is occurring, and then to solve the problem by selecting an action that will mitigate the condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 3

K/A: 000007 (BW/E02&E10, CE/E02) Reactor Trip Stabilization-Recovery / 1 A2.01
Ability to determine or interpret decreasing power level, from available indications.

Tier: 1 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: Given post reactor trip conditions, analyze a given parameter trend and determine if the trend is responding as expected. (TBAB_E01.01)

References: EOP-2.0 Basis, page 2, 29, and 30 rev 10

Question:
During the performance of EOP-2.0, "Reactor Trip Recovery", which one of the following describes the expected response of reactor power?

After the initial rapid power reduction reactor power will stabilize at ...

a. 10^{-4}% and then slowly lower over a period of hours.

b. the subcritical multiplication level and then slowly lower.

c. the subcritical multiplication level and then remain at that level.

d. 10^{-4}% and then rise slowly over a 24 hour period as Xenon burns out.

DISTRACTOR ANALYSIS

a. Selects incorrect power level (reactor is still critical at this power level).
b. **CORRECT - Reactor Trip Recovery procedure provides this guidance and trend.**
c. Selects correct power level, but incorrect trend.
d. Incorrect power level, and misinterprets the significance of Xenon for these conditions.

Cognitive Level: LOW
Recall of specific facts. Candidate must recall what is expected on available indications for lowering reactor power during the Reactor Trip Recovery emergency procedure.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 4

K/A: 00022 Loss of Reactor Coolant Makeup / 2 G 2.1.27
Knowledge of system purpose and or function.

Tier: 1 **RO Imp:** 2.8 **RO Exam:** Yes **Difficulty:** **2**

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Given plant conditions, describe the consequences of failing to monitor PZR and VCT level following isolation of letdown and charging at rated conditions. (CVCS_E011.01)

References: DBD 1.04, 3.3.8.4

Question:
Given the following conditions:

- The plant is at 100% power.
- An instrument failure caused letdown to isolate.
- Charging and Letdown are secured.
- Tave is maintained constant.

What is the expected effect of the above conditions?

a. Pressurizer level lowers, Volume Control Tank level rises.

b. Pressurizer level is constant, Volume Control Tank level lowers.

c. Pressurizer level lowers, Volume Control Tank level is constant.

d. Pressurizer level is constant, Volume Control Tank level rises.

DISTRACTOR ANALYSIS

a. **CORRECT - Pressurizer level will lower at ~4 gpm due to PCP bleedoff, which goes to the VCT.**
b. Incorrect application of system knowledge and interfaces.
c. Incorrect application of system knowledge and interfaces.
d. Incorrect application of system knowledge and interfaces.

Cognitive Level: HIGH 2
How systems interact. Candidate must understand how the Pressurizer Level Control System interacts with the Chemical and Volume Control System. To some extent, an outcome has to be predicted (3H), but the predominant intent of the question is at the 2H level.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 5

K/A: 000029 Anticipated Transient w/o Scram / 1 A2.01
Ability to determine or interpret reactor nuclear instrumentation as it applies to ATWS.

Tier: 1 **RO Imp:** 4.4 **RO Exam:** Yes **Difficulty:** 3
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given a loss or malfunction of the NI System describe the effects on the following: Reactor Protection System , Control Rod Drive System (CK11.0)

References: ARP-21, Rack A, window 2 ARP-21, Rack D, window 6

Question:
During a plant startup and just prior to Main Generator synchronization the following conditions exist:

- Reactor power is stable at 9%.
- Main Turbine speed is at 1800 RPM.

Subsequently, Wide Range Log Channel NI-03 fails HIGH.

- Reactor power remains stable at 9%.
- Main Turbine speed remains at 1800 RPM.

Which of the following is the correct assessment of the above conditions?

a. Plant responded as expected since the Reactor Protective System trip associated with the failed instrument is not active until greater than 15% power.

b. Plant responded as expected since the Reactor Protective System trip associated with the failed instrument requires failure of BOTH Wide Range channels to cause a Reactor trip.

c. The Reactor should have tripped due to the fact that one Wide Range channel supplies signals to TWO RPS channels.

d. The Reactor should have tripped due to the fact that one Wide Range channel supplies signals to ALL RPS channels.

DISTRACTOR ANALYSIS

a. Selects incorrect plant response.
b. Selects incorrect plant response.
c. **CORRECT - WR instruments do provide signals to TWO RPS channels. At less than 15% reactor power, this condition exceeds RPS setpoint and reactor will trip on 2/4 logic.**
d. Selects correct plant response, but for the incorrect reason.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate must assess plant conditions and use knowledge to predict how the plant and the Reactor Protection System should have responded.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 6

K/A: 000033 Loss of Intermediate Range NI / 7 G 2.4.6
Knowledge of symptom based EOP mitigation strategies

Tier: 1 **RO Imp:** 3.1 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.5 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: EOP-9.0 Basis for RC-1, p. 40 of 104, rev. 15

Question:
Given the following conditions:

- The plant was at 89% power when an accident occurred which required a manual reactor trip.
- Three (3) control rods will NOT insert into the core.
- All Wide Range Nuclear Instruments (NIs) have become INOPERABLE.
- The crew is implementing EOP-9.0, "Functional Recovery Procedure" and have chosen Success Path RC-1 for Reactivity Control.

What is the effect, if any, on the Reactor Operator's ability to check the status of the Reactivity Control safety function due to the loss of the Wide Range NIs?

a. No effect, since Reactivity Control is satisfied due to Xenon building in for the next approximately 10-12 hours.

b. Reactivity Control must be satisfied by manually driving down ONE of the stuck control rods.

c. Will need to check Reactor power at less than 100 cps and constant or lowering using the Source Range NIs.

d. Will need to check Reactor power at less than 2% using delta T power indication.

DISTRACTOR ANALYSIS

a. Incorrect required compensatory monitoring method.
b. Incorrect required compensatory monitoring method.
c. **CORRECT - This method is prescribed by the functional recovery procedure.**
d. Incorrect required compensatory monitoring method.

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate is required to describe the implications and consequences of the loss of Wide Range NIs and how that impacts monitoring ability, and any alternate means that can be used to ensure Reactivity Control.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 7

K/A: 000058 Loss of DC Power / 6 A2.02
Ability to determine and interpret 125V dc bus voltage, low/critical low, alarm as they apply to the Loss of DC Power.

Tier: 1 **RO Imp:** 3.3. **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank Direct (1999 NRC R83)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given an Off Normal event and control room references, describe the effect of the Off Normal condition on affected plant systems and components: (IOTF1_CK15.0)

References: ONP-2.3, 6.0.2 (NOTE prior to), rev 12

Question:
Given the following plant conditions:

- PCS temperature is 420ºF.
- Variable Low Temperature Overpressure Protection (LTOP) system is armed in LTOP mode.
- Charging Pump P-55A is operating.
- Letdown is in service.

The following alarm then annunciates:

EK-0547, 125V DC BUS GROUND

Immediately after this alarm, DC Panel D-11-1 voltage drops to 0 volts. With NO operator action, Primary Coolant System leakage will occur due to ...

a. PIC-0202, CVCS Letdown Pressure Controller, failing CLOSED.

b. CV-2009, Letdown Isolation Valve, failing CLOSED.

c. PRV-1042B, Pressurizer PORV, failing OPEN.

d. PT-0105B, Wide Range Pressurizer Pressure, failing HIGH.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that PIC-0202 will lose power when panel D11-1 fails, but power is supplied to the controller through an inverter.
b. **CORRECT - CV-2009 fails closed on a loss of DC power. This will cause PCS leakage through letdown relief valve RV-2006 since PCS pressure is now felt at the valve.**
c. Candidate incorrectly believes that the fail position of PRV-1042B is open, but it actually fails closed on a loss of DC power.
d. Candidate incorrectly believes that PT-0105B will lose power on the loss of D11-1, but power is received through an inverter.

Cognitive Level: HIGH 2
Describing consequences or implications. Candidate must recognize use knowledge of the DC system and associated alarms to explain expected consequences and implications of the loss. And to some extent, candidate is required to predict an event or outcome (PCS leakage) as a result of the loss, though the predominant intent of the question is at the HIGH 2 level.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 8

K/A: 000056 Loss of Offsite Power / 6 A2.20
Ability to determine and interpret AFW flow indicator as it applies to the Loss of Offsite Power.

Tier: 1 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** **4**
Group: 3 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: For automatic actions associated with the Auxiliary Feedwater System:
* AFAS actuation (including C-187 sensors)
* Pump auto start sequence
* Pump trip
* State the parameter and value (setpoint) at which each automatic action occurs
* Explain the purpose of each automatic actuation

in accordance with E-17, Sheets 21, 21A, 22. (AFW_CK10.0)

References: DBD-5.05, Table 3.1-4, Table 3.1-6, rev 6

Question:
Given the following conditions:

- The plant is at full power when a Loss of All Offsite Power occurs.
- BOTH Diesel Generators have started and loads are sequencing.
- The Reactor trips, but the Main Turbine does NOT automatically trip.
- Steam Generator (S/G) levels quickly lower to approximately 10% before the NCO manually trips the Main Turbine.
- 30 seconds after manually tripping the Main Turbine the NCO notes that Auxiliary Feedwater (AFW) flow indicates 0 gpm to each S/G.

What action, if any, is required, and why?

a. No action is required, since AFW Pump P-8A will be sequenced on and deliver design flow to each S/G.

b. The operator must manually initiate AFAS (Aux. Feed Actuation Signal) due to the Loss of Offsite Power.

c. The operator must manually start AFW Pump P-8C since P-8A has failed to start on low Steam Generator level.

d. No action is required since no power is available to motor driven AFW pumps and the turbine driven AFW pump will deliver design flow in 92 seconds.

DISTRACTOR ANALYSIS

a. **CORRECT - With a valid standing AFAS, P-8A will sequence on and provide flow.**
b. Candidate incorrectly believes any AFAS signal is lost when power is lost, but S/G levels are below AFAS actuation setpoint, and with proper load sequencing AFAS will occur, with flow provided.
c. Candidate incorrectly believes P-8A has FAILED to start, but in reality it has not been sequenced on yet.
d. Candidate incorrectly believes AFW pumps are not sequenced on to the D/Gs, but they are.

Cognitive Level: LOW
Recall setpoints and specific facts. Candidate must show ability to use knowledge of AFW system setpoints and sequencing operation to determine the correct system response.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 9

K/A: 001 Control Rod Drive K6.03
Knowledge of the effect of a loss or malfunction on reactor trip breakers, including controls.

Tier: 2 **RO Imp:** 3.7 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Describe the design features and interlocks that provide the following Control Rod Drive System functions: Automatic rundown of control rods (1-41) after a Reactor Trip. (CRD_CK09.0)

References:

Question:
During a critical approach the following conditions exist:
- All Shutdown Rods are fully withdrawn.
- Control Rod Drive Motor power is selected as shown in photo below.
- Motor Control Center #1 de-energizes.

For the above conditions, which one of the following is true?

a. The Reactor trip breakers remain closed, but a rod drivedown automatically inserts the Shutdown Rods.

b. If the Reactor were to trip for some reason, rod drivedown would NOT occur.

c. The Reactor cannot be tripped unless HS-C15-MBTS is selected to "Bus #1".

d. Automatic Reactor trips are disabled, but the Reactor can be manually tripped from C-01 or C-06.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes a rod drivedown would occur, but this only occurs on a reactor trip.
b. **CORRECT - Since switch is selected to breaker 52-125, this means that if MCC 1 were deenergized, rod drive motors cannot be energized.**
c. Candidate misunderstands the function of this switch, and of RPS trip circuitry for trip breakers.
d. Candidate misunderstands the function of this switch, and of RPS trip circuitry for trip breakers.

Cognitive Level: HIGH 2
How systems interact; describing consequences or implications. Candidate is required to show knowledge of the relation between control rod drive system and the power select system and then determine the implications of that relationship for a particular plant condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 10

K/A: 003 Reactor Coolant Pump A2.03
Ability to (a) predict the impacts of problems associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.

Tier: 2 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45/13

Palisades Training Objective: Predict how the following conditions will impact operation of the Primary Coolant Pumps: : PCP Motor Oil Reservoir Levels (PCP_CK13.0)

References: ARP-5, window 27, rev 65

Question:
Given the following plant conditions:

- During a power escalation the plant is at 86% power
- Primary Coolant Pump (PCP) P-50C upper reservoir oil level has lowered to 28% due to a known oil leak which has gotten worse.

What is the impact of these conditions, and how are the procedures used to mitigate the condition?

These conditions lead to ...

a. elevated winding temperatures. The Off-Normal procedure for loss of Component Cooling Water is used to provide pump trip criteria.

b. high bearing temperatures. The Alarm Response Procedure is used to provide guidance on monitoring the bearings.

c. high bearing temperatures. SOP-1, "Primary Coolant System" provides a troubleshooting guide to minimize oil leak rate.

d. pump high vibration (DANGER level). The Off-Normal procedure for rapid power reduction is used to provide plant shutdown criteria.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes low bearing oil leads to winding temperature problems, but per the ARP the concern is for high bearing temperatures.
b. **CORRECT - This upper reservoir is bearing oil. A low level will cause elevated bearing temperatures. The ARP prescribes monitoring of the temperatures.**
c. Candidate correctly interprets significance of the problem, but is incorrect in use of procedurer.
d. Candidate misinterprets significance of the problem, and is incorrect in use of procedures.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate must use knowledge of PCPs and supporting system parameters and predict the outcome (and required action) of an abnormal condition.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 11

K/A: 004 Chemical and Volume Control A2.27
Ability to (a) predict the impacts of improper RWST boron concentration on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.

Tier: 2 **RO Imp:** 3.5 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45/3 45/5

Palisades Training Objective: Given a directive, make up to Volume Control Tank From Safety Injection Refueling Water Tank in accordance with SOP-2A.
(CVCS_T08.00)

References: SOP-2a, 7.5.4, rev 51

Question:
Given the following conditions:

- Plant is in MODE 4 at EOL.
- SIRW Tank boron is 2420 ppm.
- Volume Control Tank (VCT) level is 67%.
- A critical approach is in progress.

If directed to raise VCT level to 75% using SIRW inventory, the NCO should ...

a. perform the evolution using SOP-2a, "Chemical and Volume Control System"

b. perform the evolution ONLY after a second SIRW Tank boron sample.

c. NOT perform the evolution since the upcoming criticality may occur at a HIGHER rod position than planned.

d. NOT perform the evolution since the upcoming criticality may occur at a LOWER rod position than planned.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes there is no concern with these plant conditions.
b. Candidate incorrectly believes that a second SIRW sample would alleviate any concerns for SIRW boron.
c. **CORRECT - SIRW boron concentration is signficantly higher than shutdown boron. This means a higher rod position than predicted to overcome boron.**
d. See item "c" above.

Cognitive Level: HIGH 2
Describe consequences or implications. Candidate must recognize an abnormal parameter (SIRW boron) and determine the implications and consequences of that condition, including whether an evolution should be performed based on those implications.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 12

K/A: 013 Engineered Safety Features Actuation G 2.1.23
Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Tier: 2 **RO Imp:** 3.9 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank Direct (1999 NRC C64)**

Applicable 10CFR55 Section: 45.2 / 45.6

Palisades Training Objective: Given plant conditions involving a CHP or CHR signal, predict the effects on operation and control of the Containment Hydrogen Monitoring System (CH2_E01.03)

References: SOP-38, Caution on page 16, rev 16

Question:
A Containment High Pressure (CHP) has occurred. The operators are attempting to determine the hydrogen concentration of containment.

What would be the effect of operating the Hydrogen Monitors in ANALYZE without taking any other actions?

a. A potential leakage path to the environment would be established.

b. An explosive mixture of hydrogen and oxygen may be created in the monitors.

c. The monitor may be damaged due to overpressure.

d. The sample pumps may be damaged due to having no flow path.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that the monitors are not rated for containment pressure following an accident, resulting in a leakage path.
b. Candidate incorrectly believes that the monitor will concentrate hydrogen to an explosive level in the monitor.
c. Candidate incorrectly believes that the monitors are not rated for containment pressure following an accident.
d. **CORRECT - The sample valves isolate on a CHP or CHR signal. Operating the pumps without first enabling the valves will cause the PD sample pumps to operate without a suction or discharge path.**

Cognitive Level: LOW
Recognition of procedural steps and cautions. Candidate must recall a caution in the procedure and recognize the basis for the caution.

K/A Match Assessment: **ADEQUATE**

References Supplied to Candidate: **None**

Question Number: 13

K/A: 017 In-core Temperature Monitor A4.01
Ability to manually operate and/or monitor actual in-core temperatures in the control room.

Tier: 2 **RO Imp:** 3.8 **RO Exam:** Yes **Difficulty:** **3**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 to 45.8

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution, or warning in accordance with the Emergency Operating Procedure Bases Document.
(TBAC_TBCORE_CK02.0)

References: EOP-4.0 Basis for Step 19, p.65 of 310, rev. 13

Question:
For accident conditions with NO Primary Coolant Pumps operating which of the following is the PREFERRED means of monitoring actual temperatures in the reactor core?

a. Hot Leg Temperatures since all RTDs are in the flowstream of any natural circulation that has developed.

b. Hot Leg Temperatures since the Class 1E RTDs are located closer to the actual core than are the CET thermocouples.

c. Core Exit Thermocouples (CETs) since all thermocouples are located in the flowstream of any natural circulation that has developed.

d. Core Exit Thermocouples (CETs) since they are located at the top of the core, and do not rely on loop flows.

DISTRACTOR ANALYSIS

a. Incorrectly believes Hot Leg RTDs are preferred for given conditions, even though stated location of sensing point is correct.
b. Incorrect method and for the incorrect reason. Hot Leg RTDs are not located closer to the core.
c. Selects the correct sensor, but for the wrong reason. CETs are not located in circulation flowstream.
d. **CORRECT - As prescribed by the reference.**

Cognitive Level: HIGH 2
Comprehension; recognizing relationships, how systems interact; implications. Candidate is required to demonstrate comprehension of the spatial relationships in the context of flow between installed thermocouples and the flow of the Primary Coolant System, and the resulting implications (i.e., <u>why</u> CETs are preferred method of monitoring temperatures) of this relationship

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 14

K/A: 022 Containment Cooling A3.01
Ability to monitor automatic operation of the CCS, including initiation of safeguards mode of operation.

Tier: 2 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** 3
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7 / 45.5

Palisades Training Objective: For the following Containment Cooling System major components: Containment Air Cooler Recirculation Fans V-1A/B, V-2A/B, V-3A/B, V-4A/B (CAIR_CK02.0)

References: EOP Supp 5

Question:
Given the following:

- A DBA LOCA has occurred
- ALL ESF equipment has actuated as designed

Which ONE of the following describes the expected Containment Air Cooling Fan configuration?

a. "A" fans running, "B" fans tripped, and the Service Water discharge valves from Coolers V-1, V-2 and V-3 CLOSED

b. "A" fans tripped, "B" fans running, and the Service Water inlet valves to Coolers V-1, V-2, and V-3 OPEN

c. "A" fans tripped, "B" fans running, and the Service Water discharge valve from Cooler V-4 OPEN

d. "A" fans running, "B" fans tripped, and the Service Water inlet valve to Cooler V-4 CLOSED

DISTRACTOR ANALYSIS

a. The fan response is correct, but the valves response is actually backward from correct (see "d").
b. Incorrect fan response, correct valve response.
c. Incorrect fan response, incorrect valve response.
d. **CORRECT - Correct fan and valve response.**

Cognitive Level: LOW
Recall specific facts; setpoints (in the context of automatic actuation). Candidate is required to KNOW the design response of the system for the listed ESFAS actuation.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 15

K/A: 056 Condensate A2.04
Ability to (a) predict the impacts of the loss of condensate pumps on the Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions.

Tier: 2 **RO Imp:** 2.6 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.13

Palisades Training Objective: Describe the design features and interlocks that provide the following Main Condenser, Condensate and Feedwater system functions: Condensate minimum flow (CDFW_CK09.0)

References: GKatt Memo dated 2/3/98 (accessed via Lesson Plan CDFW, rev 0)
ARP-1, window 55, ONP-3, Rev 18

Question:
Given the following conditions:

- The Plant is at 30% power during a power escalation.
- BOTH Condensate Pumps are in service.
- ONE Main Feedwater Pump is in service.
- One of the operating Condensate Pumps trips.

Which of the following describes the impact on the Condensate System Recirculation Valve (CV-0730), and what must the operator do?

CV-0730 will throttle in the ...

a. OPEN direction and direct more flow to feedwater trains. Monitor Heater Drain Pumps for normal operation.

b. OPEN direction and direct more flow to the Main Condenser Hotwell. Align alternate Gland Seal Exhauster to maintain vacuum.

c. CLOSED direction and direct more flow to feedwater trains. Monitor Heater Drain Pumps for normal operation.

d. CLOSED direction and direct more flow to the Main Condenser Hotwell. Align alternate cooling to Air Ejector Condenser to maintain vacuum.

DISTRACTOR ANALYSIS

a. Since the valve is designed to maintain ~5800 gpm through the system, and that flow has been signficantly reduced due to the pump trip, CV-0730 will actually CLOSE and attempt to maintain 5800 gpm.
b. See "a".
c. **CORRECT - See "a".**
d. CV-0730 closing actually directs more flow through the feedwater trains by shutting down on flow to condenser hotwell.

Cognitive Level: HIGH 2
Rephrasing information; consequences or implications. Candidate must comprehend the implications and consequences on the entire Condensate System, given plant condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 16

K/A: 059 Main Feedwater K4.19
Knowledge of MFW design feature(s) and/or interlock(s) which provide for automatic feedwater isolation of MFW.

Tier: 2 **RO Imp:** 3.2 **RO Exam:** Yes **Difficulty:** **2**
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Describe the design features and interlocks that provide the following Main Condenser, Condensate and Feedwater system functions: Automatic Feedwater Isolation(CDFW_CK09.0)

References: ARP-5, window 70, rev 65 FSAR 7.5.1.3

Question:
Which of the following describes the operation and purpose of the Main Feed Regulating Bypass Valve "auto closure on low S/G pressure" key switch?

a. "ENABLE" allows an operator to open the bypass valve on a low S/G pressure to allow feeding the steam generators with the condensate pumps.

b. "DEFEAT" allows an operator to open the bypass valve on a low S/G pressure to allow feeding the steam generators with the condensate pumps.

c. "DEFEAT" ensures that the valve is closed on a low S/G pressure.

d. "ENABLE" ensures that the valve is open on a low S/G pressure.

DISTRACTOR ANALYSIS

a. Candidate misinterprets term "ENABLE" by believing it allows the bypass valve to be opened, when in reality "ENABLE" arms the valve to be closed on low S/G pressure.
b. **CORRECT - DEFEAT means to defeat the auto closure on low S/G pressure. These valves would be need open if feeding with Condensate Pumps.**
c. Candidate misapplies "DEFEAT" function; see "b".
d. Candidate misapplies "ENABLE" function; see "b".

Cognitive Level: LOW
Recall specific facts. Candidate must recall knowledge of a design feature of the Main Feedwater System isolation function.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 17

K/A: 061 Auxiliary/Emergency Feedwater G 2.2.22
Knowledge of limiting conditions for operations and safety limits.

Tier: 2 **RO Imp:** 3.4 **RO Exam:** Yes **Difficulty:** 4

Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 43.2 / 45.2

Palisades Training Objective: Given plant conditions and Technical Specifications, determine required Technical Specification actions for the Auxiliary Feedwater System, in accordance with Tech Spec 3.3.3, 3.3.4, 3.3.7, 3.3.8, and 3.7.5.
(AFW_CK21.0)

References: PROVIDE Tech. Spec. 3.7.5, Amendment 200; 3.7.6, Amendment 189 SOP-12, 4.7.b

Question:
For the Auxiliary Feedwater System, which one of the following conditions requires entry into a Technical Specification Limiting Condition of Operation (LCO)? (Assume MODE 1 conditions.)

a. T-2, Condensate Storage Tank, inventory is 63,500 gallons, and T-81, Primary Makeup Water, is 41,000 gallons.

b. FIC-0737A has been selected to AUTO.

c. P-8B and P-8C are the only operable Aux. Feedwater Pumps.

d. P-8C control handswitch HS-P-8C has been selected to the MANUAL position for 3 hours for surveillance testing.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that less than 100,000 gallons in T-2 alone requires TS entry. Actually, it is the combined inventory of T-2 AND T-81 that must be greater than 100,000 gallons to satisfy TS.
b. There are certain restrictions on flow controller operation and operability; but candidate misapplies it here, since FIC-0737A still operable in auto.
c. **CORRECT - If P-8B is not operable, TS LCO entry is required, since P-8B is required to be operable anytime the reactor is critical.**
d. Two AFW pumps may be in manual for testing up to 4 hours, without LCO entry.

Cognitive Level: LOW
Knowledge of procedural steps. Candidate must recognize a condition which requires the use or entry of a procedure step (specifically, Technical Specification entry.)

K/A Match Assessment: **GOOD**

References Supplied to Candidate: Tech. Spec. 3.7.5, 3.7.6

Question Number: 18

K/A: 071 Waste Gas Disposal K4.06
Knowledge of design features and/or interlocks which provide for sampling and monitoring of waste gas release tanks.

Tier: 2 **RO Imp:** 2.5 **RO Exam:** Yes **Difficulty:** 4
Group: 1 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45.5

Palisades Training Objective: Given references, describe the modes of operation, and if applicable, interlocks/trips for the following equipment in accordance with P&IDs, SOPs, and ARPs:
* Waste Gas Decay Tank Inlet and Outlet Valves
* Waste Gas Decay Tanks Discharge Valve (CV-1123) (ISEE_CK09.0)

References: SOP-18A, 4.2.1, 7.8, rev 33

Question:
Which of the following describes the process for providing sample flow for a Waste Gas Decay Tank? (Assume normal plant conditions.)

a. Sampling is performed at four different pressures during the fill. Sample flow is provided by OPENING a manual air valve, which OPENS the sample valve.

b. Sampling is performed at two different pressures during the fill. Sample flow is provided by CLOSING a manual air valve, which OPENS the sample valve.

c. As the tank fills, sampling is performed CONTINUOUSLY. Sample flow is provided by CLOSING a manual air valve, which OPENS the sample valve.

d. The tank is sampled once when it is full (isolated at 95 psi). Sample flow is provided by OPENING a manual air valve, which OPENS the sample valve.

DISTRACTOR ANALYSIS

a. **CORRECT - The system operating procedure prescribes 4 sampling intervals. Sample valves are air operated. Isolating air closes the valve.**
b. Candidate believes sampling is done more than once, though the number is incorrect; incorrectly identifies valve operation method.
c. Candidate believes sampling is done more than once, though the number is incorrect; incorrectly identifies valve operation method.
d. Candidate correctly identifies valve operating method, but incorrectly believes tank is only sampled once (when it is full).

Cognitive Level: LOW
Recall specific facts. Candidate must recall how details of the waste gas tanks sampling process, and design features of the sample valves.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

WRITTEN QUESTION DATA SHEET

Question Number: 19

K/A: 002 Reactor Coolant K5.10
Knowledge of the operational implications of the relationship between reactor power and RCS differential temperature.

Tier: 2 **RO Imp:** 3.6 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45.7

Palisades Training Objective: Compare and contrast the effects on ASI of changing reactor power under the following conditions:
* BOL vs. EOL * Rapid vs. slow rate of change of power
* Larger vs. smaller power level changes * Using control rods vs. boron (IOTA_E16.01)

References: EM-04-17, Attachment 1, rev 20 FSAR Figure 4-9, rev 21

Question:
How can knowledge of the relationship between reactor power and PCS differential temperature (Thot - Tcold) be used to predict the effects on the Axial Shape Index (ASI) for a plant downpower? (Assume plant at Middle of Life.)

During the downpower, the temperature at the TOP of the core lowers...

a. MORE than the temperature at the bottom of the core. ASI becomes more POSITIVE as power moves toward BOTTOM of the core.

b. MORE than the temperature at the bottom of the core. ASI becomes more NEGATIVE as power moves toward TOP of the core.

c. LESS than the temperature at the bottom of the core. ASI becomes more NEGATIVE as power moves toward TOP of the core.

d. LESS than the temperature at the bottom of the core. ASI becomes more POSITIVE as power moves toward BOTTOM of the core.

DISTRACTOR ANALYSIS

a. Candidate correctly identifies deltaT response, but misinterprets/misapplies the effects of that.
b. **CORRECT - Since the differential temperature change is more pronounced at the top of the core, the result is a relative rise in reactivity, shifting power to top of core, and resulting more negative ASI.**
c. Candidate incorrectly identifies deltaT response; correctly identifies ASI response, but for the wrong reason.
d. Candidate incorrectly identifies deltaT response, and arrives at the incorrect ASI response.

Cognitive Level: HIGH 2
Recognizing relationships, showing similarities and differences among parts or wholes. Candidate must apply knowledge of the relationship between reactor power and PCS differential temperature to predict an outcome (i.e., effect on Axial Shape Index.)

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 20

K/A: 012 Reactor Protection K2.01
Knowledge of bus power supplies to RPS channels, components, and interconnections.

Tier: 2 **RO Imp:** 3.3 **RO Exam:** Yes **Difficulty:** **2**
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank Direct (2000 NRC C20)**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: List the power supplies for the following Reactor Protective System components: Channels A, B, C, and D
in accordance with DBD 2.05.
(RPS_CK07.0)

References: ONP-24.2, rev 21 ONP-24.3, rev 20

Question:
Which of the following are the power supplies for the Reactor Protection System BC logic matrix?

a. Y-10 and Y-30

b. Y-10 and Y-40

c. Y-20 and Y-30

d. Y-20 and Y-40

DISTRACTOR ANALYSIS

a. This combination supplies AC matrix.
b. This combination supplies AD matrix.
c. **CORRECT - Y-20 supplies Channel 'B' and Y-30 supplies Channel 'C'.**
d. This combination supplies BD matrix.

Cognitive Level: LOW
Recall specific facts. Candidate must recall the power supplies for RPS components.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 21

K/A: 016 Non-nuclear instrumentation K5.01
Knowledge of the operational implications of the separation of control and protection circuits as it applies to the NNIS.

Tier: 2 **RO Imp:** 2.7 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 45. 7

Palisades Training Objective: Given a directive, bypass or remove from bypass a Reactor Protective System trip unit in accordance with SOP-36.
(RPS_T06.00)

References: ARP-5, window 61, rev 65; FSAR 7.2 page 7.2-2, 7.2-8, 9, 7.5-8, 9

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

Refer to the attached graphic of Steam Generator level instrumentation.

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

a. LI-0751A fails LOW.

b. LI-0751A fails HIGH.

c. LIA-0702 fails LOW.

d. LIA-0702 fails HIGH.

DISTRACTOR ANALYSIS

a. This instrument is part of the reactor protection circuitry; however if it fails low, the reactor will NOT trip since two low level signals must be sensed. The bypassed channel does not affect the requirement for two channels sensing low level.
b. This instrument is part of ther reactor protection circuitry; however failing high would not cause a reactor trip.
c. This instrument is part of the control circuitry for steam generator water level (high level override). Failing low would not result in or lead to a reactor trip.
d. **CORRECT - This instrument is part of the steam generator water level (high level override) control circuit. If the instrument fails high, the feedwater regulating valves will close down to prevent a high level. With no operator action, LOW steam generator levels will result in a trip.**

Cognitive Level: HIGH 2
Rephrasing information; recognizing relationships. Candidate must apply knowledge and comprehension of the difference between control circuits and protection circuits for Steam Generator Water Level Control, along with knowledge of the function and design of each type of circuit and then finally, demonstrate comprehension of the operational implication (i.e., reactor trip) of the given condition.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: Panel Graphic of Steam Generator level instruments (attached)

Question Number: 22

K/A: 029 Containment Purge G 2.1.2
Knowledge of operator responsibilities during all modes of plant operation.

Tier: 2 **RO Imp:** 3.0 **RO Exam:** Yes **Difficulty:** 4

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given a directive, purge the containment building in accordance with SOP-24.

(PVT_T02.00)

References: SOP-24, 7.2.2, rev 36

Question:
The plant is in MODE 3 and a Containment Purge is to be performed.

Consider the following equipment:

1. V-46, Air Room Purge Supply Fan
2. CV-1805, 1806, 1807, 1808, Containment Purge Exhaust Valves
3. T-64D, Clean Waste Receiver Tank

Which of the following describes operational restrictions for performing this Containment Purge?

a. V-46 can be used ONLY if the Containment Purge Exhaust Valves are OPEN in order to prevent pressurizing containment.

b. V-46 operation is NOT allowed, but the Containment Purge Exhaust Valves must be OPEN to completely purge containment.

c. Containment Purge Exhaust Valves must be locked CLOSED, and purge flow is via T-64D removed rupture disk. V-46 operation is NOT allowed.

d. Containment Purge Exhaust Valves must be locked CLOSED. V-46 is operated to provide adequate purge flow via T-64D removed rupture disk.

DISTRACTOR ANALYSIS

a. Procedural restrictions prevent the use of Fan V-46.
b. Plant mode prevents the use of the Purge Exhaust Valves.
c. **CORRECT - All restrictions are correct, per the operating procedure.**
d. Candidate correctly identifies that Purge Exhaust valves cannot be used, but fails to realize that V-46 cannot be used, and further; misapplies system knowledge regarding the function of V-46.

Cognitive Level: HIGH 2
How systems interact. Candidate must comprehend the implications of the relationship between HVAC equipment and the containment purge evolution. This question also tests comprehension of the importance of a high degree of sensitivity to containment integrity.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 23

K/A: 039 Main and Reheat Steam A4.04
Ability to manually operate and/or monitor in the control room emergency feedwater pump turbines.

Tier: 2 **RO Imp:** 3.8 **RO Exam:** Yes **Difficulty:** 3

Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.7 / 45.5 to 45.8

Palisades Training Objective: For the Auxiliary Feedwater System:
* List the Control Room indications
* Describe the Control Room controls (AFW_CK08.0)

References: SOP-12, 7.2.5, rev 42 ARP-36, #3-8, rev 4

Question:
What indication is available in the Control Room for a low suction pressure trip of the turbine driven Auxiliary Feedwater Pump P-8B, and what operation is required for resetting the trip? (For resetting, assume that the low suction pressure condition has been corrected.)

a. A shared alarm with P-8A provides indication of low suction pressure condition. Reset by taking HS-0522B to OPEN.

b. AMBER light above HS-0522B will illuminate to indicate low suction pressure condition. Reset by taking HS-0552B to CLOSE.

c. AMBER light above HS-0522B will illuminate to indicate low suction pressure condition. Reset by taking HS-0522B to OPEN.

d. A shared alarm with P-8A provides indication of low suction pressure condition. Reset by taking HS-0522B to CLOSE.

DISTRACTOR ANALYSIS

a. Candidate correctly identifies alarm function, but does not understand how to reset low suction.
b. There is an AMBER light above the handswitch, but it indicates AUTO mode for pump start.
c. There is an AMBER light above the handswitch, but it indicates AUTO mode for pump start.
d. **CORRECT - This is the function of the alarm; the low suction relay actuation is reset by taking the HS to close.**

Cognitive Level: LOW
Recall of discrete bits of information. Candidate is tested on knowledge of design features that are useful in monitoring the steam driven auxiliary feedwater pump operation.

K/A Match Assessment: **GOOD**

References Supplied to Candidate: **None**

Question Number: 24

K/A: 062 AC Electrical Distribution K3.01
Knowledge of the effect that a loss or malfunction of the ac distribution system will have on major system loads.

Tier: 2 **RO Imp:** 4.1 **RO Exam:** Yes **Difficulty:** 4
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **Bank (Direct) Prac2(RO66)**

Applicable 10CFR55 Section: 41.7 / 45.6

Palisades Training Objective: Predict how the following conditions will impact operation of the Electrical Distribution system:
* Bus undervoltage
* Bus overcurrent
* Transformer deluge operation
* Transformer sudden pressure (SPS_CK13.0)

References: ARP-2, window 31, rev 41

Question:
Given the following conditions:

- The plant is operating at 60% power.
- EK-0331, MAIN TRANSFORMER SUDDEN PRESS, alarms.
- All plant components/systems respond as expected.

The Main Transformer deluge actuates and ...

a. the plant remains at power. 4160 VAC Buses 1A and 1B fast transfer to Startup Transformers 1-1 and 1-3, respectively.

b. the plant trips. 4160 VAC Buses 1A and 1B fast transfer to Startup Transformer 1-1 and 1-3.

c. the plant remains at power. 2400 VAC Safeguards Buses Bus 1C and 1D deenergize and are repowered by the Diesel Generators.

d. the plant trips. 2400 VAC Safeguards Buses Bus 1C and 1D fast transfer to Startup Transformer 1-2.

DISTRACTOR ANALYSIS

a. The plant will actually trip due to a lockout relay actuation.
b. **CORRECT - The sudden pressure relay actuation actuates a lockout relay (386P) which trips the main generator and the plant.**
c. These buses are normally powered from Safeguards Transformer 1-1 and will remain so.
d. These buses are normally powered from Safeguards Transformer 1-1 and will remain so. They do not fast transfer for the given conditions.

Cognitive Level: HIGH 3
Predict an event or outcome. Candidate is given a set of conditions, a malfunction, and then required to apply knowledge to predict the outcome.

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 25

K/A: 086 Fire ProtectionA2.01
Ability to (a) predict the impacts of manual shutdown of the FPS on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of that operation.

Tier: 2 **RO Imp:** 2.9 **RO Exam:** Yes **Difficulty:** **3**
Group: 2 **SRO Imp:** n/a **SRO Exam:** No **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.13

Palisades Training Objective: For automatic actuations associated with the Fire Protection System:
* state the parameter and value (setpoint) at which the automatic actions occurs
* explain the purpose of each automatic actuation

in accordance with SOP-21, ARP-7, ARP-12, ARP-23, ARP-24.
(FPS_CK10.0)

References: EK-1135, EK-1134

Question:
Given the following plant conditions:

- The plant is at 40% power.
- No equipment is out of service.
- Due to a miscommunciation, the Auxiliary Operator manually shuts off P-13 Fire Jockey Pump.

Assuming all equipment functions per design, what is the expected impact of this action on the Fire Protection System, and which procedure should be referred to by the operator?

a. NO automatic action occurs. Operator refers to EK-1135, "FIRE SYSTEM HEADER LO PRESS" for required actions.

b. NO automatic action occurs. Operator refers to SOP-21, Fire Protection System for manually starting P-9B Diesel Fire Pump.

c. P-9A Motor Driven Fire Pump auto starts. Operator refers to EK-1134, "MOTOR DRIVEN FIRE PUMP RUNNING" for required actions.

d. P-41 Diesel Fire Pump auto starts. Operator refers to EK-1140, "DIESEL FIRE PUMP RUNNING" for required actions.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes no pump auto starts, but P-9A will start on low header pressure.
b. Candidate incorrectly believes no pump auto starts, but P-9A will start on low header pressure.
c. **CORRECT - Shutting off the jockey pump causes system pressure to degrade.**
d. P-9A will start at 98 psig and maintain system pressure.

Cognitive Level: HIGH 3
Describe consequences or implications. Candidate is given a situation and must apply knowledge of the Fire Protection System to predict the impacts on the system.

K/A Match Assessment: **EXCELLENT**

References Supplied to Candidate: **None**

Question Number: 1

K/A: 000011 Large Break LOCA / 3 A2.07
Ability to determine or interpret that equipment necessary for functioning of critical pump water seals is operable as it applies to a Large Break LOCA.

Tier: 1 **RO Imp:** n/a **RO Exam:** No
Difficulty: **4**
Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source: NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given references, describe the Technical Specifications bases for the Component Cooling Water System in accordance with Technical Specification 3.7.7. (SRO Only)

(CCW_CK22.0)

References: M-209, sh.2 SOP-3, Attachment 4, 2.0.3, rev 52 SOP-3, Attachment 10, page 13, rev 52
ARP-7, window 55 and 56, rev 64 Tech Spec Basis for 3.5.2, Background

Question:
To ensure that in the event of a Large Break LOCA the Low Pressure Safety Injection Pump P-67A bearings and seals will be cooled adequately, which of the following is true for the valves listed below?

- CV-0913, CCW Inlet to Safeguards
- CV-0950, CCW Outlet from Safeguards

These valves are normally maintained ...

a. CLOSED to prevent seal leakage when pump is idle, but automatically open on a SIAS.

b. CLOSED to reduce the potential for draining CCW to the lake, but automatically open on a SIAS.

c. OPEN due to single failure criteria concerns, even though they receive an open signal on a SIAS.

d. OPEN because they do NOT receive an open signal on a SIAS.

DISTRACTOR ANALYSIS

a. Seal leakage sounds like a real concern, but candidate misapplies it here.
b. For certain conditions this is a concern, and is even listed in the procedure; however, candidate misapplies it here.
c. **CORRECT - Though not original plant design, this was deemed to be a prudent feature.**
d. Candidate incorrectly believes these valves are not affected by an SIAS.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 2

K/A: 000029 Anticipated Transient w/o Scram / 1 A2.08
Ability to determine or interpret rod bank step counters and RPI as they apply to a ATWS.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3
Group: 1 **SRO Imp:** 3.5 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Describe the operational design of each of the following Control Rod Drive System major components: (CRD_E02.02)
* Primary Position Indication
* Secondary Position Indication
* Control Rod Matrix
in accordance with the FSAR.

References: DBD-2.05, page 37 of 129, rev 3

Question:
Which of the following describes the design basis of the ATWS circuitry and its interface with the rod position indicating system?

a. Circuitry designed to provide a completely independent trip from the RPS, therefore the Plant Process Computer rod position indication must be used, since ATWS actuation does not affect LED display on panel C-02.

b. Circuitry is designed to provide a completely independent trip from the RPS. ATWS actuation will cause LED display on panel C-02 to change from 131" to 0".

c. Circuitry design does not require it to provide a completely independent trip from the RPS. ATWS actuation affects rod position indication exactly the same as an RPS trip.

d. Circuitry is designed to provide a completely independent trip from the RPS. ATWS actuation will cause Plant Process Computer rod position indication to change from 0" to 131".

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes that ATWS does not affect LED display, when in reality a reactor trip due to an ATWS, or any condition, will be indicated on the rod position LED display.
b. **CORRECT - A reactor trip due to an ATWS, or any condition, will be indicated on the rod position LED display.**
c. Candidate incorrectly believes that ATWS design does not require it to be independent from RPS.
d. Candidate is correct that ATWS is independent from RPS, but interpretation of the interface with rod position indication is incorrect.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 3

K/A: 000029 Anticipated Transient w/o Scram / 1 G 2.1.2
Knowledge of operator responsibilities during all modes of plant operation.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.12

Palisades Training Objective: Given the plant at power, evaluate plant conditions and trip or recommend tripping/shutting down the Reactor when warranted in accordance with AP-4.14, Conduct Of Operations, and in use ARPs and ONPs.
(IOTF1_T15.00)

References: AP 4.14, rev 0

Question:
Given the following conditions:

- The plant is at full power.
- There are TWO licensed operators in the Control Room, one NCO, and the Control Room Supervisor.
- The Turbine NCO is in the restroom.
- The Shift Engineer is in the Tech. Support Center.
- The Main Turbine and Generator spuriously trip.
- The Reactor does NOT automatically trip.
- The Reactor NCO has a seizure and is rendered unable to function as a licensed operator.

As the Control Room Supervisor, what is your required action, and what procedure specifies this action?

a. Contact the Turbine NCO to manually trip the Reactor, as required by Admin Proc. 4.00, "Operations Organization, Responsibilities, and Conduct".

b. You must manually trip the Reactor, as required by Admin Proc. 4.14, "Conduct of Operations".

c. Contact the Shift Engineer to call out the EMTs, and then manually trip the Reactor, as required by Admin Proc. 4.14, "Conduct of Operations"

d. You must manually trip the Reactor, as required by Admin Proc. 4.02, "Control of Equipment."

DISTRACTOR ANALYSIS

a. Candidate misapplies requirements of either the union contract, or of the procedure guidance.
b. **CORRECT - Per the procedure listed the SRO is required to trip the reactor.**
c. Candidate misapplies the procedure guidance. While medical attention is important, this sequence is not specified by any procedure.
d. Correct action, but incorrect procedure.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 4

K/A: 000055 Station Blackout / 6 A2.06
Ability to determine or interpret faults and lockouts that must be cleared prior to re-energizing buses as they apply to a Station Blackout.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4
Group: 1 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: EOP-3.0 EOP Supplements as mentioned in question

Question:
A Station Blackout has occurred. As the Control Room Supervisor, how do you use the procedures to determine which relays should be checked in order to help you evaluate which power source to restore first?

a. Use SOP-32, "345KV Switchyard" for an attachment which lists all Switchyard relays and expected status of those relays for a Station Blackout event.

b. EOP Supplement 28, "Supplementary Actions for Loss of Power" will direct you to use EOP Supplement 22, "Switchyard Relay/Target List".

c. EOP Supplement 21, "Restoration of 'F' or 'R' Buses" will direct you to use EOP Supplement 22, "Switchyard Relay/Target List".

d. At Step 16 of EOP-3.0, "Station Blackout Recovery" you will be directed to use EOP Supplement 29, "Restore Buses 1C, 1D, 1E Power from Off-Site Source".

DISTRACTOR ANALYSIS

a. Candidate incorrectly assumes by virtue of the procedure title that it contains the needed guidance. However, SOP-32 is primarily directed towards routine activities and not specific to troubleshooting.
b. Candidate incorrectly assumes by virture of the procedure title that it contains the needed guidance. However, this procedure has very little to do with the electrical system, and is primarily compensatory actions for equipment which had lost power.
c. **CORRECT - These two supplements are used together for the required actions.**
d. Candidate incorrectly assumes by virture of the procedure title that it contains needed guidance, but also incorrectly applies procedure intent. This procedure is used after an offsite power source is restored.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 5

K/A: 000055 Station Blackout / 6 G 2.4.6
Knowledge of symptom based EOP mitigation strategies.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 1 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.11

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: EOP-9.0, RC-1,2,3, MVAE-AC-1

Question:
A Station Blackout has occurred concurrent with THREE stuck rods. Both Diesel Generators are running and have failed to automatically load. Both Steam Generator levels are at approximately -10% and lowering with NO Auxiliary Feedwater flow.

Which one of the following describes the required sequence of mitigation strategy?

a. **Sequential Actions:**
1. Open RPS breakers 42-1 and 42-2.
2. Close D/G output breakers.
3. Start P-8B Auxiliary Feedwater Pump.

b. **Sequential Actions:**
1. Start P-8B Auxiliary Feedwater Pump.
2. Close D/G output breakers.
3. Open RPS breakers 42-1 and 42-2.

c. **Sequential Actions:**
1. Open RPS breakers 42-1 and 42-2.
2. Start P-8B Auxiliary Feedwater Pump.
3. Close D/G output breakers.

d. **Sequential Actions:**
1. Close D/G output breakers.
2. Start P-8B Auxiliary Feedwater Pump.
3. Open RPS breakers 42-1 and 42-2.

DISTRACTOR ANALYSIS

a. **CORRECT - Candidate correctly identifies the action associated with the correct priority safety function.**
b. Incorrect sequence and assessment of safety function hierarchy.
c. Incorrect sequence and assessment of safety function hierarchy.
d. Incorrect sequence and assessment of safety function hierarchy.

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 6

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4 A2.04
Ability to determine or interpret the relationship between RCS temperature and main steam pressure as it applies to a Inadequate Core Cooling.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 1 **SRO Imp:** 4.2 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given plant conditions, remove Primary Coolant System Voids IAW EOP Supplement 26. (TBAC_T01.00)

References: EOP-4.0 Basis, page 278 of 310, rev 13 EOP Supplement 26

Question:
Given the following conditions:

- The plant is operating at 100% power.
- A small break LOCA occurs inside containment.
- EOP-4.0, "Loss of Coolant Accident Recovery" is being implemented.
- Reactor Vessel Level Monitoring System (RVLMS) has ALL red lights LIT for both channels.

If this condition worsens, how will Primary Coolant System temperature and Main Steam pressure respond, and what action is required to address the condition?

a. As CETs continue to indicate saturated conditions, main steam pressure will LOWER due to code safety operation. Transition from EOP-4.0, to EOP-9.0, "Functional Recovery Procedure."

b. CETs will rapidly rise to indicate superheated conditions, main steam pressure will RISE. Transition from EOP-4.0, to EOP-9.0, "Functional Recovery Procedure."

c. CETs will rapidly rise to indicate superheated conditions, main steam pressure will RISE. Remain in EOP-4.0 and implement EOP Supplement 26, "PCS Void Removal".

d. As CETs continue to indicate saturated conditions, main steam pressure continues to RISE. Remain in EOP-4.0 and implement EOP Supplement 20, "Hot Leg Injection Via PZR".

DISTRACTOR ANALYSIS

a. Incorrect assessment of plant conditions; incorrect procedural transition.
b. Candidate incorrectly believes the functional recovery procedure should be used.
c. **CORRECT - Optimal procedure in conjunction with specific guidance for void removal is the required procedure usage.**
d. Incorrect assessment of plant conditions, incorrect procedure usage.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 7

K/A: 000074 (W/E06&E07) Inad. Core Cooling / 4 G 2.1.30
Ability to locate and operate components, including local controls.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 1 **SRO Imp:** 3.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.7

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the mitigating strategy of the in use Emergency Operating Procedure in accordance with the Emergency Operating Procedure Bases Document. (TBAC_TBCORE_CK01.0)

References: ONP-25.2, step 19, rev 18

Question:
Given the following conditions:

- The reactor has been manually tripped due to a small break LOCA.
- The operating crew has just begun carrying out the Immediate Actions of EOP-1.0, "Standard Post-Trip Actions".
- A fire is reported in Cable Spreading Room and large amounts of smoke and noxious fumes are entering the Control Room.
- Pressurizer pressure is 1300 psia and lowering and NO Safety Injection equipment has actuated, and cannot be actuated manually.
- You have issued the order to evacuate the Control Room.

To ensure safety injection flow to the core, you need to dispatch ...

a. ONE operator to Bus 1D to manually start LPSI P-67A and open at least one loop injection MOV with local switch.

b. ONE operator to Bus 1C to manually start LPSI P-67B and open at least one loop injection MOV with local switch.

c. TWO operators; ONE to Bus 1D to manually start HPSI P-66A and ONE to Panel C-150A to open at least one loop injection valve with local switch.

d. TWO operators; ONE to Bus 1C to manually start HPSI P-66B and ONE to Panel C-33 to open at least one loop injection valve with local switch.

DISTRACTOR ANALYSIS

a. Inadequate operators; incorrect pump to be started. At this pressure, no flow would be delivered.
b. Inadequate operators; incorrect pump to be started. At this pressure, no flow would be delivered.
c. Correct number of needed operators, but locations are incorrect. There are no loop injection valve controls at C-150, and Bus 1D is the opposite bus than what is required for the pump listed.
d. **CORRECT - A HPSI pump is the correct pump for the conditions, correct bus for listed pump, and loop injection valve control location is correct.**

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 8

K/A: 000076 High Reactor Coolant Activity / 9 G 2.1.28
Knowledge of the purpose and function of major system components and controls.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7

Palisades Training Objective: Describe the Technical Specification bases for the Primary Coolant System, in accordance with Technical Specifications 3.4.16. (SRO ONLY)
(PCS_CK22.0)

References: Tech Spec 3.4.16 Applicability Basis

Question:
Which of the following describes the Technical Specification applicability for PCS Specific Activity, including the basis?

This Technical Specification is applicable in ...

a. MODES 1, 2, and 3 with Tave $\geq$ 300ºF based on the lift settings for the ADVs and the Turbine Bypass Valve.

b. MODES 1, 2, and 3 with Tave $\geq$ 500ºF based on the lift settings for the ADVs and the main steam safety valves.

c. MODES 1, 2, 3, and 4 with Tave $\geq$ 500ºF based on the analyzed failure mode of the ADV and Turbine Bypass Valve controller.

d. MODES 1, 2, and 3 with Tave $\geq$ 300ºF based on the lift settings for the ADVs and the main steam safety valves.

DISTRACTOR ANALYSIS

a. Correct mode, but incorrect temperature and incorrect basis.
b. **CORRECT - Correct mode, temperature, and basis.**
c. Incorrect mode, correct temperature, incorrect basis.
d. Correct mode, incorrect temperature, correct basis.

Cognitive Level: HIGH 3

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 9

K/A: 000007 (BW/E02&E10; CE/E02) Reactor Trip -Stabilization-Recovery / 1 A2.06
Ability to determine or interpret occurrence of a reactor trip as it applies to a reactor trip.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 2 **SRO Imp:** 4.5 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 / 45.6

Palisades Training Objective: Given a scenario involving a reactor trip, determine if the event should be classified as a Condition 1 or 2 in accordance with AP 4.08. (SRO Only) (APCO_E08.03)

References: AP 4.08, 5.3.4, a, rev 5

Question:
Given the following:

- The plant is at full power.
- Testing of the Main Turbine Protective Trips is in progress.
- The operator at the front pedestal inadvertently causes the Main Turbine to trip, and immediately notifies the Control Room of what happened.
- All plant equipment functions as designed.

Which of the following is the correct Trip Classification of this event, and what procedures will be implemented?

a. Implement EOP-1.0, "Standard Post Trip Actions", and then EOP-2.0, "Reactor Trip Recovery". This is a Condition I trip, and does NOT require a PRC review prior to restart.

b. Implement EOP-1.0, "Standard Post Trip Actions", and then EOP-9.0, "Functional Recovery Procedure". This is a Condition II trip, and DOES require a PRC review prior to restart.

c. Implement EOP-2.0, "Reactor Trip Recovery", and then EOP-9.0, "Functional Recovery Procedure". This is a Condition I trip, and does NOT require a PRC review prior to restart.

d. Implement EOP-1.0, "Standard Post Trip Actions", and then EOP-2.0, "Reactor Trip Recovery". This is a Condition II trip, and DOES require a PRC review prior to restart.

DISTRACTOR ANALYSIS

a. **CORRECT - Correct procedure use, correct trip classification and requirement for restart.**
b. Correct procedure initially, but incorrect transition, incorrect trip classification, but correct subsequent authorization.
c. Incorrert initial procedure use, correct trip classification, and subsequent authorization.
d. Correct procedure use, incorrect trip classification and subsequent authorization.

Cognitive Level: HIGH 3

K/A Match Assessment: GOOD

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 10

K/A: 000022 Loss of Reactor Coolant Makeup / 2 G 2.4.30
Knowledge of which events related to system operations/status should be reported to outside agencies.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 2 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.11

Palisades Training Objective: Given procedure AP-4.00 and AP-3.03, determine the non-emergency events that require notification. (SRO only)
APOR_E01.03

References: TS 3.5.1, Action A, C TS 3.5.2, Action A ORM 3.2

Question:
For full power plant conditions, which one of the following conditions affecting the ability to makeup to the Primary Coolant System requires notification to the Nuclear Regulatory Commission?

a. Charging Pump P-55B is inoperable and will be restored in 4 days.

b. LPSI P-67A is inoperable and will be restored in 60 hours.

c. Safety Injection Tank T-82A pressure is 180 psig and lowering. It will be restored to normal in 4 days.

d. Boric Acid Pump P-56A spuriously started and was manually stopped. Repairs will require 68 hours.

DISTRACTOR ANALYSIS

a. There are no Tech Specs for the CVCS equipment.
b. Candidate incorrectly assesses the Tech Spec implications of this condition and believes that a plant shutdown is required, or that NRC notification is required. The associated LCO is 7 days.
c. **CORRECT - The associated LCO has been exceeded and since a plant shutdown is now required, notification to the NRC is required (4 hour reportable).**
d. Candidate incorrectly believes this was a safeguards equipment unplanned actuation.

Note: Common 42 question is somewhat similar to this one, but it is not considered a duplication, because this question focuses on knowledge of notification requirements, and not evaluating the actual condition.

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 11

K/A: 000033 Loss of Intermediate Range NI / 7 G 2.2.25
Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 2 **SRO Imp:** 3.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.2

Palisades Training Objective: Describe the Technical Specification bases for the NI System, in accordance with Technical Specifications 3.3.1. (SRO only) (CK22.0)

References: Tech Spec 3.3.1 Basis for Condition D, and Action D.1, D.2

Question:
Refer to the provided LCO 3.3.1, page 3.3.1-2.

Which of the following describes a failure of equipment that would require entry into CONDITION D, and what is the basis for the REQUIRED ACTION? (Assume APPLICABILITY conditions exist.)

a. One Source Range channel NI becomes inoperable. The Safety Analysis relies on the Source Range NIs to remove ZPM Bypass for a Continuous Rod Withdrawal.

b. The ZPM bypass key can be removed from the keyswitch in BYPASS. Affected RPS trips are bypassed for reactor protection in the event of a Control Rod Ejection.

c. One Power Range channel NI becomes inoperable. The Safety Analysis relies on the Power Range NIs to remove ZPM Bypass for a Control Rod Ejection.

d. One Wide Range channel NI becomes inoperable. The Safety Analysis relies on the Wide Range NIs to remove ZPM Bypass for a Continuous Rod Withdrawal.

DISTRACTOR ANALYSIS

a. Candidate misapplies system interrelationships, resulting in the incorrect basis.
b. Candidate exhibits incorrect system knowledge, resulting in the incorrect basis.
c. Correct basis, but for the incorrect instrument required.
d. **CORRECT - Per Tech Spec basis the Wide Range NIs are taken credit for removing any ZPM bypasses for the given event.**

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: LCO 3.3.1, page 3.3.1-2

Question Number: 12

K/A: 000038 Steam Generator Tube Rupture / 3 A2.15
Ability to determine or interpret pressure at which to maintain RCS during S/G cooldown as it applies to a SGTR.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **2**
Group: 2 **SRO Imp:** 4.4 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution, or warning in accordance with the Emergency Operating Procedure Bases Document.
(TBAC_TBCORE_CK02.0)

References: EOP 5.0 Basis for Step 17, rev 13

Question:
Given the following conditions:

- A Steam Generator Tube Rupture in "A" S/G has occurred.
- The actions of EOP-5.0, "Steam Generator Tube Rupture Recovery" are being implemented.
- "A" S/G has not yet been isolated.

What direction should be given concerning control of PCS pressure, what is the basis for it?

a. Within the limits of EOP Supplement 1, "Pressure Temperature Limit Curves" to minimize PCS dilution and maintain Shutdown Margin.

b. Within the limits of EOP Supplement 2, "PCS Cooldown Strategy" to reduce potential lifting of a Main Steam Code Safety valve.

c. Less than 940 psia to minimize the potential for a radiation release to the environment.

d. Greater than 940 psia to minimize PCS dilution, and maintain Shutdown Margin.

DISTRACTOR ANALYSIS

a. Incorrect application of the relationship between PCS pressure and faulted S/G pressure.
b. Incorrect procedure guidance (this supplement is not used for these conditions, but is actually used for a loss of feedwater event), and incorrect basis.
c. **CORRECT - Maintaining PCS pressure less than the lowest setting of the Main Steam Code Safeties precludes PCS pressure in the faulted S/G and potentially lifting the safety.**
d. Correct guidance, but the incorrect basis.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 13

K/A: 000058 Loss of DC Power / 6 A2.03
Ability to determine and interpret DC loads lost; impact on ability to operate and monitor plant systems as they apply to the Loss of DC Power.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4
Group: 2 **SRO Imp:** 3.9 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified (99NRC C83)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given off normal plant conditions, select the applicable Off Normal Procedure to mitigate the event.
(IOTF_CK03.0)

References: ONP-2.3, 6.0.1, rev 12 ARP-4, window 2, rev 56

Question:
Given the following plant conditions:

- PCS temperature is 420°F.
- LTOP System is armed in LTOP Mode.
- Charging pump P-55A is in operation.
- Letdown is in service.
- 125 VDC Panel D11-1 has deenergized due to a fault.

To address these conditions, the Control Room Supervisor will ...

a. direct the crew to reestablish Charging and Letdown flow per SOP-2A, "Chemical and Volume Control" since letdown flow automatically isolated due to loss of D-11-1.

b. implement ONP-23.1, "Primary Coolant System Leak" since RV-2006 has lifted due to closure of CV-2009 (Letdown Containment Isolation Valve), and will not reseat.

c. direct the crew to bypass the CVCS purification demineralizers due to CV-0909, Letdown Hx CCW Outlet, failing CLOSED.

d. implement ONP-23.1, "Primary Coolant System Leak" since a PORV has lifted due to loss of D-11-1.

DISTRACTOR ANALYSIS

a. This incorrect action would not address the real problem (a lifted relief valve causing a PCS leak).
b. **CORRECT - Loss of D-11-1 causes CV-2009 to close; however, letdown is still flowing from PCS into the letdown line upstream of CV-2009. In the flowpath is RV-2006 which will lift due to the higher letdown pressure.**
c. Candidate incorrectly believes that excessive letdown flow (and higher temperature) is the result of the DC loss.
d. Correct procedure, but incorrect reason and incorrect effect on plant equipment.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 14

K/A: 000065 Loss of Instrument Air / 8 G 2.4.6
Knowledge of symptom based EOP mitigation strategies.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3

Group: 2 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.5 / 45.13

Palisades Training Objective: Given plant conditions requiring use of EOP 9.0 (Functional Recovery Procedure), determine the in-use Safety Function Success Paths in accordance with EOP 9.0

(TBAH_T01.00)

References: EOP-9.0, Resource Assessment Tree I, rev 16

Question:
Which one of the following describes the mitigation strategy for the Safety Function "Maintenance of Vital Auxiliaries - Air" during the performance of EOP-9.0, "Functional Recovery Procedure"?

a. There is only ONE Success Path and it requires availability of 2400 VAC safety related power.

b. There is only ONE Success Path and it does NOT require availability of 2400 VAC safety related power.

c. There are TWO Success Paths and they BOTH require availability of 2400 VAC safety related power.

d. There are TWO Success Paths and only ONE requires availability of 2400 VAC safety related power.

DISTRACTOR ANALYSIS

a. Incorrect number of Success Paths, though candidate correctly identifies the need for safety power.
b. Incorrect number of Success Paths, incorrect assessment of power requirements.
c. Correct number of Success Paths; but only Instrument Air requires safety related power.
d. **CORRECT - Correct number of Success Paths and correct assessment of power requirements. Use of Feedwater Purity Bldg. air system requires the availability of Bus 1E, non safety-related bus.**

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 15

K/A: 000036 (BW/A06) Fuel Handling Accident / 8 A2.02
Ability to determine and interpret the occurrence of a fuel handling incident as it applies to the Fuel Handling Incidents.

Tier: 1 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 3 **SRO Imp:** 4.1 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Given off normal plant conditions, select the applicable Off Normal Procedure to mitigate the event.
(IOTF_CK03.0)

References: ONP 23.3

Question:
Given the following conditions:

- Steam Generator Nozzle Dams are installed.
- Fuel is being moved from the core to the Spent Fuel Pool.
- EK-1349 and EK-1350, Containment Sump Hi Hi Level, alarm annunciates.
- Containment Radiation Monitors, RIA-2316 and RIA-2317, indicate rising radiation levels.

Which of the following procedures has IMMEDIATE ACTIONS which must be performed for these conditions?

a. ONP-11.1, Fuel Cladding Failure

b. ONP-11.2, Fuel Handling Accident

c. ONP-17, Loss of Shutdown Cooling

d. ONP-23.3, Loss of Refueling Water Accident

DISTRACTOR ANALYSIS

a. ONP-11.1 has no Immediate Actions.
b. ONP-11.2 does have Immediate Actions, but the given plant conditions do not warrant entry.
c. ONP-17 does have Immediate Actions, but the given plant conditions do not warrant entry.
d. **CORRECT - Symptoms section of ONP-23.3 match with given plant conditions.**

Cognitive Level: HIGH 3

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 16

K/A: 001 Control Rod Drive G 2.1.33
Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **4**
Group: 1 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 43.2 / 43.3 / 45.3

Palisades Training Objective: Given the Technical Specifications and plant conditions, determine required Technical Specification actions for the Control Rod Drive System, in accordance with the Technical Specifications 3.1.4, 3.1.5, and 3.1.6.
(CRD_CK21.0)

References: COLR T.S. 3.1.6 SOP-6, 7.5

Question:
Which one of the following regulating rod group configurations requires entry into a Technical Specification Limiting Condition of Operation?

a. Group 1 at 90 inches
Group 2 at 5 inches
At least one action of Tech. Spec. 3.1.4, "Control Rod Alignment" applies.

b. Group 2 at 110 inches
Group 3 at 35 inches
At least one action of Tech. Spec. 3.1.6, "Regulating Rod Group Position Limits" applies.

c. Group 3 at 131 inches
Group 4 at 45 inches
At least one action of Tech. Spec. 3.1.6, "Regulating Rod Group Position Limits" applies.

d. Group 1 at 131 inches
Group 2 at 35 inches
At least one action of Tech. Spec. 3.1.5, "Shutdown and Part Length Rod Group Insertion Limits" applies.

DISTRACTOR ANALYSIS

a. Required overlap is 80 plus 12 inches, minus 0 inches. Given overlap is acceptable.
b. **CORRECT - Required overlap is exceeded because it is less than 80 inches between groups.**
c. Required overlap is 80 plus 12 inches, minus 0 inches. Given overlap is acceptable.
d. Required overlap is 80 plus 12 inches, minus 0 inches. Given overlap is acceptable.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 17

K/A: 061 Auxiliary/Emergency Feedwater G 2.4.4
Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**
Group: 1 **SRO Imp:** 4.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.10 / 43.2 / 45.6

Palisades Training Objective: For automatic actions associated with the Auxiliary Feedwater System:

* AFAS actuation (including C-187 sensors)

State the parameter and value (setpoint) at which each automatic action occurs and explain the purpose of each automatic actuation in accordance with E-17, Sheets 21, 21A, 22. (AFW_CK10.0)

References: SOP-12, 7.3.1.a, rev 42 ARP-21, B1, rev 48

Question:
Given the following conditions:

- A plant startup is in progress with Reactor power at 1%.
- Aux. Feedwater Pump P-8C is in service.

Which one of the following conditions requires entry into either an off-normal procedure or into an emergency operating procedure?
(Consider each condition separately.)

a. P-8C discharge pressure indicates 920 psi.

b. P-8C operating amps indicates 112 amps.

c. Flow to each Steam Generator is at 90 gpm.

d. "B" Steam Generator level is at 23%.

DISTRACTOR ANALYSIS

a. Candidate incorrectly believes discharge pressure is unacceptable, when in reality, for these plant conditions Main Steam pressure is ~900 psi, and a discharge pressure slightly higher than that is not only acceptable, but required in order to develop flow.
b. Candidate is correct in believing that 112 amps is not acceptable; however, this condition does not require ONP or EOP entry, but requires operators to reduce running amps by reducing flow.
c. Candidate believes that 90 gpm is too low; however, the given conditions for plant startup means that the operators are controlling flow as needed. ONP or EOP entry is not required.
d. **CORRECT - The RPS trip setpoint for steam generator low level is 26.9%. Given conditions exceed this. Candidate should realized this means the reactor will automatically trip, which requires entry into an EOP for Standard Post Trip Actions.**

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

Question Number: 18

K/A: 072 Area Radiation Monitoring A3.01
Ability to monitor automatic operation of the ARM system, including changes in ventilation alignment.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4
Group: 1 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **Bank - Sig. Modified**

Applicable 10CFR55 Section: 41.7 / 45.5

Palisades Training Objective: Given off normal plant conditions, select the applicable Off Normal Procedure to mitigate the event.
(IOTF_CK03.0)

References: ONP-11.2

Question:
Refueling operations are in progress when the following alarm annunciates:

- EK-1364, GASEOUS WASTE MONITORING HI RADIATION

The alarm is due to a valid high alarm condition on RIA-5712, Fuel Handling Area Vent monitor.

In response to this condition, the Control Room Supervisor will use ...

a. SOP-24, "Ventilation and Air Conditioning Systems", to direct a manual shutdown of the Fuel Handling Area ventilation system.

b. ONP-11.2, "Fuel Handling Accident" which will direct verification of the automatic tripping of V-69 Supply Fan, and to direct certain manual actions.

c. SOP-38, "Gaseous Process Monitoring System" which will direct verification of the automatic tripping of V-70A and V-70B Exhaust Fans.

d. SOP-24, "Ventilation and Air Conditioning Systems" which will direct verification of the automatic tripping of only ONE of the V-70 Exhaust Fans.

DISTRACTOR ANALYSIS

a. With refueling operations in progress and a valid alarm, conditions are met for ONP entry; and though SOP-24 does contain certain actions regarding HVAC in general, it is not used for these conditions, especially since a manual shutdown of the ventilation is not the correct action.
b. **CORRECT - ONP-11.2 prescribes performance of a ventilation checklist which verifies the stated auto action.**
c. Candidate incorrectly believes this SOP contains actions regarding the listed equipment, when in fact, there is no mention of V-70A/B in this procedure.
d. Per Design Basis Document 1.07, page 124 of 197, the second V-70 exhaust fan may require to be auto started based on inlet pressure. In any case, SOP-24 is not the correct procedure for these conditions, since ONP entry conditions are met.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 19

K/A: 012 Reactor Protection A2.06
Ability to (a) predict the impacts of failure of RPS signal to trip the reactor; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of the malfunction.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 2
Group: 2 **SRO Imp:** 4.7 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.5 / 43.5 / 45.3 / 45.5

Palisades Training Objective: Explain the design basis of the Reactor Protective System ATWS trip in accordance with DBD 2.05.
(RPS_E04.02)

References: ARP-21, Rack D5, rev 48

Question:
For a Loss of Load event, which one of the following describes the impact of a failure of the Reactor Protection System to automatically trip the reactor, and what procedure is used to mitigate the condition?
(Assume NO operator action.)

Pressurizer pressure rises to ...

a. 2235 psia and the reactor automatically trips. Implement EOP-1.0, "Standard Post Trip Actions".

b. 2235 psia and the reactor automatically trips. Implement EOP-9.0, "Functional Recovery Procedure".

c. 2375 psia and the reactor automatically trips. Implement EOP-1.0, "Standard Post Trip Actions".

d. 2375 psia and the reactor automatically trips. Implement EOP-9.0, "Functional Recovery Procedure".

DISTRACTOR ANALYSIS

a. Incorrect pressure, correct procedure.
b. Incorrect pressure, incorrect procedure. Candidate believes an ATWS warrants functional recovery entry.
c. **CORRECT - Correct pressure and procedure.**
d. Correct pressure, incorrect procedure. Candidate believes an ATWS warrants functional recovery entry.

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 20

K/A: 029 Containment Purge A4.01
Ability to manually operate and/or monitor in the control room containment purge flow rate.

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 2

Group: 2 **SRO Imp:** 2.5 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 41.7 / 45.5 to 45.8

Palisades Training Objective: Given a directive, purge the containment building in accordance with SOP-24. (PVT_T02.00)

References: SOP-24, 7.2.5, rev 36 ODCM HP 6.14 Operating Requirements Manual

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Question:
A Containment Purge is to be performed with the plant in MODE 5, using the Containment Purge Exhaust Valves, CV-1805, 1806, 1807, and 1808.

Which document is used to provide guidance for monitoring or controlling the Containment Purge, and what is required?

a. Health Physics 6.14, "Containment Purge" prescribes a purge flow rate of LESS than 100 scfm.

b. SOP-24, "Ventilation and Air Conditioning System" requires logging the times of Containment Purge Exhaust valves operation.

c. The Offsite Dose Calculation Manual allows a flow rate (up to a maximum of 100 scfm) that results in a nuclide sum fraction of < 10.0.

d. The Operating Requirements Manual requires the Containment Purge Exhaust valves to be open for NO MORE THAN a total of 30 minutes.

DISTRACTOR ANALYSIS

a. Health Physics 6.14 contains no prescribed flow rate that is directly measurable.
b. **CORRECT - The controlling parameter for a containment purge is by keeping close account (log entries) of start and stop times.**
c. ODCM contains no prescribed flow rate that is directly measurable. It does list a required nuclide sum fraction, but is a value 10 times less than mentioned here.
d. There is no time limit associated with the valves, and particularly none associated with the Operating Requirements Manual.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 21

K/A: 062 AC Electrical Distribution A4.01
Ability to manually operate and/or monitor in the control room: all breakers (including available switchyard).

Tier: 2 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 3
Group: 2 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 45.3

Palisades Training Objective: Given a directive, align 345KV Switchyard in accordance with SOP-32. (SPS_T02.00)

References: AP 4.28, 12.5.1, rev 0

Question:
Which document delineates the operational responsibilities for breaker operations in the Palisades Plant 345 KV Switchyard?

a. Admin Procedure 4.00, "Operations Organization, Responsibilities, and Conduct".

b. Admin Procedure 4.14, "Conduct of Operations".

c. Admin Procedure 4.28, "Control of Palisades Switchyard Activities".

d. SOP-30, "Station Power".

DISTRACTOR ANALYSIS

a. Candidate recalls that there are a number of operational requirements in this procedure, however, is incorrect in believing it covers switchyard breaker operations.
b. Candidate recalls that there are a number of operational requirements in this procedure, however, is incorrect in believing it covers switchyard breaker operations.
c. **CORRECT - AP 4.28 is a relatively recent procedure (Palisades switchyard responsibilities have changed) and is very specific on breaker operation responsibilities.**
d. Though there are numerous requirements regarding breaker operations in general, they do not apply to switchyard breakers, and who is responsible for them.

Cognitive Level: LOW

K/A Match Assessment: GOOD

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 22

K/A: 2.1.22 Ability to determine Mode of Operation.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**

Group: 1 **SRO Imp:** 3.3 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.5 / 45.13

Palisades Training Objective: Explain the following terms in accordance with TS Section 1.1:
* Mode
(APTS_E01.02)

References: GOP-3, 4.1, Attachment 1, 1.21, rev 18 Tech. Spec. Table 1.1-1

Question:
For the following conditions:

- The reactor is not critical.
- Tave is at 532ºF
- Group A and Group B Shutdown Rods are fully withdrawn.
- All part length rods are withdrawn.

Which of the following describes the resulting mode change when withdrawing the FIRST regulating rod?

This is a mode change from ...

a. MODE 3 to MODE 2 and requires authorization from the Plant Manager.

b. MODE 3 to MODE 2 and requires authorization from the Reactor Engineering Manager.

c. MODE 2 to MODE 1 and requires authorization from the Reactor Engineering Manager.

d. MODE 2 to MODE 1 and requires authorization from the Site Vice President.

DISTRACTOR ANALYSIS

a. **CORRECT - Correct mode change, with correct authorization required.**
b. Correct mode change, but authorization required is Plant Manager.
c. Incorrect mode change (Mode 1 occurs at 5% power), and incorrect authorization.
d. Incorrect mode change (Mode 1 occurs at 5% power), and incorrect authorization.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

WRITTEN QUESTION DATA SHEET

Question Number: 23

K/A: 2.3.6 Knowledge of the requirements for reviewing and approving release permits.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** 4

Group: 3 **SRO Imp:** 3.1 **SRO Exam:** Yes **Source:** **NEW**

Applicable 10CFR55 Section: 43.4 / 45.10

Palisades Training Objective: Given references, Approve Waste Discharge/Release Permits without error. (RMS_T02.00)

References: COP-31, 3.1, 5.2, Attachment 2, rev 19

Question:
During an outage, a portion of the water in the hotwell is to be released to the lake, per COP-31, "Non-Radiological Environmental Operating Procedure".

For reviewing and approving this release, the Shift Supervisor (SS) is required to ensure that the

a. batch volume has not changed, required dilution flow is met. After the release, SS forwards Discharge Authorization to the Environmental Coordinator.

b. Discharge Authorization was prepared by a qualified Chemistry Technician. Check at least ONE Dilution Water pump in service. After the release, SS forwards Discharge Authorization to the Certified Waste Treatment Plant Operator (WTPO).

c. required dilution flow is met. After the release , SS forwards Discharge Authorization to the Chemistry and Rad Services Supervisor.

d. Discharge Authorization was prepared by the Environmental Coordinator, batch volume has not changed, required dilution flow is met. After the release, SS forwards Discharge Authorization to the Certified Waste Treatment Plant Operator.

DISTRACTOR ANALYSIS

a. **CORRECT - Verification of release conditions are required. Routing of form after release completion is correct.**
b. Chemistry Technician is responsible for sampling and analysis, but not for preparing the release form.
c. One of the required verifications, but routing after the release is incorrect.
d. Incorrect preparation responsibility, correct verification of batch conditions, incorrect post release routing.

Cognitive Level: LOW

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 24

K/A: 2.4.18 Knowledge of the specific bases for EOPs.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **2**

Group: 4 **SRO Imp:** 3.6 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 41.10 / 45.13

Palisades Training Objective: Given plant conditions involving Emergency Operating Procedures, describe the bases of any EOP step, note, caution, or warning in accordance with the Emergency Operating Procedure Bases Document.
(TBAC_TBCORE_CK02.0)

References: EOP Supp 3 Basis, page 2, rev 9

Question:
Given the following conditions:

- A reactor trip has occurred due to a loss of offsite power.
- Subsequently, Startup Power has been restored to the plant.
- It is now desired to restart a Primary Coolant Pump per EOP Supplement 3, "Starting Primary Coolant Pumps".

One of the start criteria in this EOP Supplement is that the average of Qualified CETs must be at least 25ºF subcooled. The BASIS for this requirement is to prevent ...

a. emptying the Pressurizer.

b. overpressurizing the PCS.

c. pump cavitation and damage.

d. reactor head voiding.

DISTRACTOR ANALYSIS

a. Candidate correctly believes that voiding concerns may cause Pressurizer level to lower, but misapplies it here since there is a separate start criterion for Pressurizer level.
b. Candidate misapplies a concern for PCS pressure, when in reality starting a PCP will provide spray flow for pressure reduction if needed.
c. **CORRECT - Adequate subcooling ensures PCP operating requirements are met.**
d. See "a".

Cognitive Level: HIGH 2

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None

Question Number: 25

K/A: 2.4.40 Knowledge of the SRO's responsibilities in emergency plan implementation.

Tier: 3 **RO Imp:** n/a **RO Exam:** No **Difficulty:** **3**

Group: 4 **SRO Imp:** 4.0 **SRO Exam:** Yes **Source:** **Bank (Direct)**

Applicable 10CFR55 Section: 45.11

Palisades Training Objective: Given a reactor trip situation, from memory, perform the actions of EOP 1.0 in accordance with Operations Standards. (TBAB_T01.00)

References:

Question:
The plant is operating at full power on "A" Shift when the NCO informs the CRS of a rising Charging flow rate and lowering Pressurizer level.

- At 0113 hours the NCO informs the CRS that "A" Charging Pump is at full speed and that "B" and "C" Charging Pumps have started.
- Pressurizer level is continuing to lower.
- At 0117 hours the CRS directs a manual reactor trip.

By which one of the following times should the current emergency be classified in accordance with the Emergency Plan?

a. 0128 hours

b. 0132 hours

c. 0147 hours

d. 0213 hours

DISTRACTOR ANALYSIS

a. **CORRECT - 15 minutes is the required time interval and measured from the time entry conditions were met.**
b. Candidate correctly identifies 15 minutes, but uses the incorrect time of origin.
c. Incorrect time (30 minutes from reactor trip).
d. Incorrect time (1 hour from time of entry conditions)

Cognitive Level: HIGH 3

K/A Match Assessment: EXCELLENT

References Supplied to Candidate: None