1. 001 1
Answer: D
Unit 2 has been at 60% power for 3 days.
<u>The following conditions exist</u>:
- Control Bank D is at 174 steps withdrawn.
- Rod Control is in automatic.
- RCS Auctioneered High Tave is 564 deg F and steady.

Control Bank D rods start withdrawing at 8 steps per minute. With Control Bank D at 177 steps, Rod Control is placed in Manual, and all rod motion stops.

Which ONE of the following describes why control rods will be inserted in manual to 174 steps withdrawn in accordance with 02-OHP-4022-012-003, Continuous Control Bank Movement?

A. To prevent reduced charging flow.

B. To prevent exceeding QPTR Limits.

C. To restore RCS pressure to normal.

D. To restore Tave to programmed band.

ANSWER: %Answer%
60% power, programmed Tave is~ 563.2 degrees. Act. Tave is ~0.8 deg above program. When rods withdraw, power will rise, then the reactivity from the rise in temperature will cause power to return to ~ it's pre-withdraw power, with Tave higher. Auct. high Tave feeds other systems that rely on Tave to remain on program. Rods are reinserted to restore equilibrium.

A - Incorrect - Charging flow will rise to raise PZR level to higher setpoint established from higher Tave.
B - Incorrect - QPTR will not be significantly affected by withdrawing the rods in a group as designed.
C - Incorrect - Automatic pressure control system will raise spray flow temporarily to restore the higher pressure to 2235 psig.
Lesson Plan/Objective:RO-C-AOP-7/AOP7.6

Reference:02-OHP-4022-012-003, Continuous Control Bank Movement step 3, pg. 4
RO-C-AOP-7, Abnormal Operating Procedures-Day 7 pg. 21

Continuous Rod Withdrawal
Knowledge of the reasons for the following responses as they apply to the Continuous Rod Withdrawal:
Manually driving rods into position that existed before start of casualty
RO-3.2 SRO-3.6

2. 002 3
Answer: C
Unit 1 is in the process of starting up following an outage. Reactor trip breaker testing was taking place with power at 2%. A loss of offsite power results in the trip of all RCPs. Additionally, CRID 2 is lost when the CD EDG energizes T11D.

<u>The following conditions exist:</u>
- Reactor trip breaker A - OPEN
- Reactor trip bypass breaker A - OPEN
- Reactor trip breaker B - OPEN
- Reactor trip bypass breaker B - CLOSED
- WR startup rate is -0.3 dpm
- RCS T_{avg} is 547°F and lowering

Which ONE of the following is the NEXT action required of the operators and why?

A. Send an operator to locally verify reactor trip breakers are open because control room indications are NOT accurate with a loss of CRID 2.

B. Transition to 01-OHP-4023-FR-S.1, Response to Nuclear Power Generation/ATWS, because the reactor failed to trip.

C. Transition to 01-OHP-4023-E-0, Reactor Trip or Safety Injection, because the reactor has tripped.

D. Manually close the steam dump valves because they incorrectly opened due to the reactor trip breaker status.

ANSWER: %Answer%
The Plant has tripped. Only 1 trip breaker/bypass set is required to open to trip the plant. With the plant in Mode 2, 01-OHP-4023-E-0 is applicable.

A - Incorrect - Trip and Bypass indications are not affected by CRID 2.
B - Incorrect - The reactor has tripped. 01-OHP-4023-S.1 is not required.
D - Incorrect - The Steam dumps will close on the loss of power.(Loss of CW and loss of CRID 2)
Lesson Plan/Objective:RO-C-01200/11

Reference:RO-C-01200 Rod Control and Rod Position Indicating System pg. 14-15
OHI-4023 Abnormal/Emergency Procedure User's Guide Attachment 2 pg. 28

Reactor Trip
Knowledge of the interrelations between a reactor trip and the following:
Reactor trip status panel
RO-3.5 SRO-3.6

3. 003 4
Answer: A
Which ONE of the following describes the procedural actions in response to addressing a leaking Pressurizer (PRZ) PORV?

A. 1. All PORV block valves are initially closed to lower tailpipe temperature.
   2. One PORV block valve is opened at a time.
   3. Leakage is determined by a rise in tailpipe temperature after each PORV block valve is re-opened.

B. 1. PORV block valves are closed one at a time.
   2. Temperature on the tailpipe is monitored by the operator.
   3. Leakage is determined by a lowering of tailpipe temperature after each PORV block valve is closed.

C. 1. PORV block valves are closed one at a time.
   2. Temperature on the Pressurizer Relief Tank (PRT) is monitored by the operator.
   3. Leakage is determined by a lowering PRT temperature after each PORV block valve is closed.

D. 1. All PORV block valves are initially closed to stabilize Pressurizer Relief Tank (PRT) temperature.
   2. One PORV block valve is opened at a time.
   3. Leakage is determined by a rise in PRT temperature after each PORV block valve is re-opened.

ANSWER: %Answer% - The procedure requires that all PORV Block Valves be initially closed. Once tailpipe temperature is lowering, the block valves are opened 1 at a time to check for a rise in tailpipe temperature.

B - Incorrect - All Block Valves are initially closed.
C - Incorrect - All Block Valves are initially closed. PRT conditions are checked but not used to determine leaky valves.
D - Incorrect - PRT conditions are checked but not used to determine leaky valves.
Lesson Plan/Obj: RO-C-AOP-1/AOP1.17

Reference: OHP-4022-002-009, Leaking Pressurizer Power Operated Relief Valve

Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open)
Ability to operate and/or monitor the following as they apply to the Pressurizer Vapor Space Accident:
PZR spray block valve and PORV block valve

4. 004 3
Answer: B
The plant has experienced a large break LOCA. The reactor has tripped and an SI signal is present. Charging Pumps Suction from RWST IMO-910 opened BUT IMO-911 failed to open.

Which ONE of the following is the impact of this action on the Charging Pump suction flow?

A. Both operating charging pumps will receive suction flow from the VCT.

B. Both operating charging pumps will receive suction flow from the RWST.

C. One charging pump will continue to take suction from the VCT and one charging pump will take suction from the RWST.

D. One charging pump will take suction from the RWST. The other charging pump will have no suction until operator action is taken.

ANSWER: %Answer%
CVCS suction from the RWST is provided through the IMO-910 and IMO-911 valves which are in a parallel arrangement allowing either valve to provide suction to both pumps.

A - Incorrect - The VCT suction valves will isolate on a SI signal.
C - Incorrect - The VCT suction valves will isolate on a SI signal.
D - Incorrect - IMO-910 and IMO-911 valves which are in a parallel arrangement allowing either valve to provide suction to both pumps.

Lesson Plan/Objective:RO-C-00300/13

Reference: RO-C-00300, Chemical Volume Control System pg. 62 & 64
SOD-00300-01 Charging and Letdown System drawing

Large Break LOCA
Ability to operate and/or monitor the following as they apply to a Large Break LOCA:
Manual and/or automatic transfer of suction of charging pumps to borated source
RO-4.3 SRO-3.9

5. 005 1
Answer: A
Unit 2 Reactor Startup is in progress with Reactor Power at 2E-8 amps and rising.

<u>The following conditions exist:</u>
- Annunciator Panel 207 Drop 62, RCP 3 Bearing Temp High, is alarming
- Annunciator Panel 207 Drop 63, RCP 3 BRG Seal Water Temp High, is alarming
- RCP No. 3 Lower Bearing water temperature is 228°F and rising.
- RCP No. 3 Motor Bearing temperature is 174°F and stable.
- RCP No. 3 Seal Leakoff temperature is 179°F and rising.
- RCP No. 3 Seal Injection Flow is 10 gpm.

Which ONE of the following operator actions MUST be taken based upon these conditions?

A. Manually trip the reactor, Enter 02-OHP 4023.E-0, Reactor Trip or Safety Injection, perform immediate actions, then trip the No. 3 RCP.

B. Initiate reactor shutdown per 02-OHP 4021.001.003, Power Reduction and trip the No. 3 RCP after the reactor is shutdown.

C. Do NOT trip the reactor. Trip the No. 3 RCP and be in Hot Shutdown in 1 hour.

D. Do NOT trip the reactor. Trip the No. 3 RCP and close the No. 1 seal leakoff valve.

ANSWER: %Answer%
The Plant is not analyzed/licensed to operate with less than 4 RCPs. Lower bearing water temperature is > 225°F which requires a trip. The reactor must first be tripped and verified and then the RCP is tripped.

B - Incorrect - RCP Lower bearing temperature has exceeded the trip setpoint.
C - Incorrect - The Plant is not analyzed/licensed to operate with less than 4 RCPs. Tech Specs require Hot Standby in 1 hour.
D - Incorrect - The Plant is not analyzed/licensed to operate with less than 4 RCPs.

Lesson Plan/Objective:RO-C-AOP-4/AOP4.20

Reference:RO-C-AOP-4, Abnormal Operating Procedures – Day 4 pg. 58-59
02-OHP-4022-002-00, Malfunction of a Reactor Coolant Pump pg. 4 & 16 (Steps 1 and 14)

Reactor Coolant Pump (RCP) Malfunctions
Knowledge of the operational implications of the following concepts as they apply to Reactor Coolant Pump Malfunctions:
Consequences of an RCPS failure
RO-3.7 SRO-4.1

6. 006 2
Answer: D
Unit 1 Reactor power is at 50%.

The following conditions exist:
- PRZ level is stable at program level
- QRV-251 Charging Flow Controller is in MANUAL
- Charging and letdown are balanced.

Which ONE of the following describes the effect on the plant if QRV-251 Charging Flow Controller remains in MANUAL and power is increased to 100%?

A. Charging flow will RISE.

B. Charging flow will LOWER.

C. PRZ level will LOWER.

D. PRZ level will RISE.

ANSWER: %Answer%
With QRV-251 Charging Flow Controller in Manual Charging flow will remain constant since RCS pressure is constant. As the RCS heats up the Pressurizer Level will rise as the water expands.

A - Incorrect - With QRV-251 Charging Flow Controller in Manual Charging flow will remain constant.
B - Incorrect - With QRV-251 Charging Flow Controller in Manual Charging flow will remain constant.
C - Incorrect - With QRV-251 Charging Flow Controller in Manual Charging flow will remain constant. As the RCS heats up the Pressurizer Level will rise as the water expands.

Lesson Plan/Objective:Lesson Plan/Objective: RO-C-00202 / #8

Reference : SOD-0202-003, Pressurizer Level Control

Loss of Reactor Coolant Makeup
Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Pump Makeup:
Reason for changing from manual to automatic control of charging flow valve controller
RO-2.9 SRO-3.0

7. 007 2
Answer: B
Per Technical Specifications, which ONE of the following conditions MEETS the associated MINIMUM requirement for the Borated Water Sources to be considered OPERABLE in Mode 3? (2-Figure 19.17 Boric Acid Storage Tank Volume is attached)

A. A flowpath to the Centrifugal Charging Pump (CCP) via Boric Acid Flow Control Valve, 2-QRV-421.

B. A Boric Acid Storage Tank solution temperature of 64°F.

C. A Boric Acid Storage Tank level of 70%.

D. A Boric Acid Storage Tank boron concentration of 6540 ppm.

ANSWER: %Answer%
Per TS 3.1.2.8 a Minimum solution temperature of 63°F is required for Operability.

A - Incorrect - The flowpath to the charging pump can take credit for 2-QMO-420 Emergency Boration Valve
C - Incorrect - a water volume of 8500 gallons is required which corresponds to ~72%
D - Incorrect - A concentration of 6550-6990 ppm is required.

Lesson Plan/Objective:RO-C-00300/16

Reference:SD-00300, Chemical and Volume Control System Description
Technical Specification 3.1.2.8 Borated Water Sources - Operating pg. 3/4 1-16
Technical Specification Bases 3/4.1.2 Boration Systems pg. 3/4 1-2, 1-3, & 1-4

Emergency Boration
Knowledge of the operational implications of the following concepts as they apply to Emergency Boration:
Low temperature limits for boron concentration
RO-2.8 SRO-3.6

Reference Provided 2-Figure 19.17 Boric Acid Storage Tank Volume

8. 008 1
Answer: A
During an ATWS event, the fuel cladding fission product barrier is severely challenged. Which ONE of the following conditions is the mechanism which causes the fuel/cladding challenge?

A. Fuel overheating from DNBR limits being exceeded.

B. High RCS pressure caused by high temperature.

C. Overpower of the fuel/fuel rod.

D. Excessive radial flux distribution.

ANSWER: %Answer%
If the DNBR decreases too far, the possibility exists that fuel damage will occur since the heat energy from the fuel is not efficiently removed.
B - Incorrect - RCS Pressure is a concern for vessel integrity but it will not lead to fuel damage.
C - Incorrect - Power of the fuel should not exceed normal power levels and will likely be less.
D - Incorrect - Radial flux distribution should not be affected.

Lesson Plan/Objective:RO-C-EOP04/6

Reference:RO-C-EOP04, Subcriticality CSFST, FR-S Series EOPs, and Background Information pg. 20

Anticipated Transient Without Scram (ATWS)
Knowledge of the operational implications of the following concepts as they apply to the ATWS:
Reactor nucleonics and thermo-hydraulics behavior
RO-2.8 SRO-3.1

9. 009 1
Answer: A
Core Alterations are in progress on Unit 2. RCS boron concentration has been verified to be 2360 ppm (two samples analyzed).

The crew is required to ...
A. suspend core alterations and positive reactivity changes, and initiate boration.

B. suspend core alterations and positive reactivity changes, and establish containment integrity.

C. suspend core alterations and remove all personnel from the containment building.

D. remove all personnel from the containment building, establish containment integrity, and initiate boration.

ANSWER: %Answer%
Technical Specification 3.9.1 requires either Keff <.95% or 2400ppm concentration. 02-OHP-4030-227-037 requires the most conservative of the Keff or 2400 ppm.

B - Incorrect - Containment Integrity is not required.
C - Incorrect - Containment evacuation is not required.
D - Incorrect - Containment evacuation and Containment Integrity are not required.

Lesson Plan/Objective:RO-C-ADM13/ADM13.3.0

Reference: 02-OHP-4030-227-037 Refueling Surveillance pg. 4 & 34 (Steps 3.2 and DS-3 Step 1)
Technical Specification 3.9.1 Refueling Boron Concentration pg. 3/4 9-1

Fuel Handling Incidents
Knowledge of the operational implications of the following concepts as they apply to Fuel Handling Incidents:
SDM
RO-3.4 SRO-3.8

10. 010 1
Answer: B
During power operation, SG tube leakage was detected and estimated at 50 gpm when RCS pressure was 2200 psig and SG pressure was 800 psig. The plant was shutdown and a cooldown initiated.

Which ONE of the following is the approximate current leak rate if RCS pressure is 1700 psig and SG pressure is 1000 psig? Assume the break size has not changed.

A. Approximately 50% of the initial leak rate (~25 gpm)

B. Approximately 70% of the initial leak rate (~35 gpm)

C. Approximately 140% of the initial leak rate (~70 gpm)

D. equal to the initial leak rate (~50 gpm)

ANSWER: %Answer%
Break flow is Proportional to the Square Root of the Pressure Differential.

$$Flow_{\text{int}} \propto \sqrt{(2200-800}$$

$$Flow_{final} \propto \sqrt{(1700-1000)}$$

$$Flow = \sqrt{(1700-1000)/(2200-800)} \text{ x } 50 = .707 \text{ x } 50 \cong 35.5$$

Flow is ~70% of initial or 35 gpm

A - Incorrect - Differential pressure is 1/2 of original but break flow should be proportional to the square root of DP.
C - Incorrect - This swaps the order of the pressures 1400/700 = 2 and the square root of 2 is 1.41.
D - Incorrect - This is original value. The DP changed and so does break flow.

Lesson Plan/Objective: RO-C-GF27 / #10

Reference: RO-C-EOP05, SI Termination, ECCS Flow Reduction, and SI Reinitiation and Actuation; RO-C-GF27, Sensors and Detectors

Steam Generator (S/G) Tube Leak
Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak:
Leak rate vs. pressure drop
RO-3.5 SRO-3.9

11. 011 1
Answer: A
The control room operators are responding to a SGTR. They have identified and isolated the ruptured S/G.

During the briefing for the initial RCS cooldown, the SRO states that the RCPs should be stopped and natural circulation should be established prior to the cooldown.
The RO states that the RCPs should remain running and forced reactor coolant circulation should be used during the cooldown.

Which ONE of the following identifies which crew member is correct and why?

A. The RO -- because forced circulation will reduce susceptibility to pressurized thermal shock and minimize boron dilution concerns.

B. The RO -- because with a SG tube rupture, natural circulation conditions will be difficult to establish.

C. The SRO -- because once natural circulation is established the ruptured SG will not cooldown and depressurize thereby limiting the total amount of leakage.

D. The SRO -- because natural circulation will preclude any damage to the RCP's and minimize RCS pressure perturbations.

ANSWER: %Answer% - Forced circulation will provide better mixing and a uniform RCS cooldown rate. If the RCPs are stopped the loop flows on natural circulation will be greatly reduced and cold SI water being injected near the isolated SG may collect near the vessel downcomber and lead to a pressurized thermal shock condition.

A - Incorrect - Natural circulation can be established during a SGTR and is the case used for most design analysis (loss of offsite power).
C - Incorrect - The cooldown and depressurization of the ruptured SG will be slightly less with natural circulation but it will take longer so the total leakage will be greater.
D - Incorrect - Damage to the RCPs is not a concern until depressurization and then only if the RCS is severely depressurized. The RCPs operating will provide a more balanced cooldown and pressure control.

Lesson Plan/Objective: RO-C-EOP08 / #10

Reference: RO-C-EOP08, SGTRs, E-3 Series EOPs, and Background Information

Steam Generator Tube Rupture (SGTR)
Knowledge of the operational implications of the following concepts as they apply to the SGTR:
Natural circulation
RO-3.9 SRO-4.2

12. 012 4
Answer: A
During performance of 02-OHP-4023-ES-3.1, Post SGTR Cooldown Using Backfill the ruptured steam generator narrow range level was found to be less than 26%. The operators were instructed to refill the steam generator to 62%.

What is the concern with ruptured steam generator level less than required?

A. Uncovering the U-tube could result in an uncontrolled depressurization of the ruptured steam generator causing a reinitiation of the primary to secondary leak.

B. The broken tube could be uncovered allowing steam to flow into the RCS resulting in steam binding of the RCPs.

C. The feed ring could uncover, resulting in a water hammer and aggravating the tube damage whenever AFW is initiated subsequently.

D. SG level must remain in the narrow range, or AFW must be > 25,000 lb/hr to prevent SG dry out.

ANSWER: %Answer%
When SG level is in the narrow range, the steam region in the ruptured SG is insulated from the colder water in the U-Tubes region by a layer of warm water. This maintains SG pressure. If level drops the Steam can condense on the cooler surface of the U-Tubes.

B - Incorrect - The steam would condense in the cooler water and the volume of steam would not be great enough to impede the RCPs.
C - Incorrect - Water from AFW or FW Systems enters SG feed ring and then flows down between SG shell & tube wrapper in the SG downcomber
D - Incorrect - The intact SGs provide adequate Heat Sink. SG dryout is a concern if cold water is later introduced. With a ruptured SG, the RCS would reenter the SG.
Lesson Plan/Objective:RO-C-EOP08/#18

Reference:PSBD (Rev. 1), 12-OHP-4023-ES3.1, Background Volume ES-3.1, Page 16, "EOP Step 6 Basis"

Steam Generator Tube Rupture (SGTR)
Knowledge of the reasons for the following responses as they apply to the SGTR:
Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures
RO-4.2 SRO-4.5

13. 013 4
Answer: C
Unit 2 has experienced a steamline break. None of the main steam isolation valves can be closed. 02-OHP-4023-ECA-2.1, "Uncontrolled Depressurization of all Steam Generators," has been implemented.

Which ONE of the following statements is correct regarding Attachment A, Local SG Isolation?

A. Isolation of both steam supply lines to the TDAFP is allowed, regardless of the status of the other sources of feed flow to the SGs, since no secondary heat sink is intact.

B. Integrity must be restored to all SGs, before the operator can transition to E-2, Faulted Steam Generator Isolation, via the foldout page.

C. Valves are closed one loop at a time in order to restore integrity to at least one SG as early as possible.

D. The Operator is allowed to place the Stop Valve Dump Valve control switches to LOCKOUT only if the selected valve is NOT accessible for local isolation.

ANSWER: %Answer%
Valves are closed one loop at a time in order to ensure a complete, local check of the valves for each SG to restore integrity to at least one SG as early as possible.

A - Incorrect - Isolation of both TDAFP steam lines is NOT allowed if it is the only source of FW.
B - Incorrect - If integrity is restored to any SG the transition is made.
D - Incorrect - This action may be required if the Dump valves require manual Closure to override standing Automatic closure signal.
Lesson Plan/Objective:RO-C-EOP07/#16

Reference:PSBD Rev. 3 12-OHP-4023-ECA-2.1 Background Document Step 1 Basis pg. 6 and Attachment A Basis pg. 81

Steam Line Rupture
Knowledge of the interrelations between the Steam Line Rupture and the following:
Valves
RO-2.6 SRO-2.5

14. 014 1
Answer: B
The control room operators are responding to a RED condition on the heat sink status tree. While they attempt to restore feed flow to a S/G, conditions degrade to the point that RCS bleed-and-feed must be established.

The reason RCS bleed and feed must be established QUICKLY is to prevent:

A. A rapid RCS overpressurization, followed by a rapid RCS depressurization due to RCP seal failures.

B. The inability to provide sufficient injection flow for core cooling due to high RCS pressure.

C. An overpressurization challenge to the reactor vessel.

D. High temperature and pressure failure of Steam Generator tubes.

ANSWER: %Answer%
ECCS flow will be limited by RCS pressure. Performing the steps quickly limits the RCS pressure rise due to loss of heat Sink.

A - Incorrect - A rapid Pressure increase is NOT expected. Seal failure is not expected due to a pressure rise.
C - Incorrect - RCS Overpressurization is protected against by the Pressurizer PORVs and Safeties.
D - Incorrect - SG to RCS Differential pressure is normally limited to 1600 psid. This is not expected to be exceeded (SG at ~ 1000 psig).

Lesson Plan/Objective:RO-C-EOP11/11

Reference:PSBD Rev. 2 12-OHP-4023-FR-H.1 Background Document Step 18 Caution 1 Basis pg. 39
RO-C-EOP11 Heat Sink CSFST, FR-H Series EOPs, and Background Information pg. 26, 27, 32, & 38

Loss of Main Feedwater (MFW)
Ability to operate and/or monitor the following as they apply to the Loss of Main Feedwater (MFW):
HPI, under total feedwater loss conditions
RO-4.4 SRO-4.5

15. 015 2
Answer: C
Unit 1 has just entered mode 3 following a maintenance outage to replace a leaky fuel assembly. During work on the East RHR pump, an accidental spill causes radiation levels to increase.

The following radiation channels have alarmed:
ERA-7305 U1 East RHR Pump Room - RED
VRS-1505 Unit Vent Effluent Low Range Noble Gas - RED

Which ONE of the following is true regarding system operations based on these conditions?
A. The Auxiliary Building Supply fans have automatically tripped.

B. The AES Fan Charcoal Filter has automatically aligned.

C. The AES Fan Charcoal Filter must be manually placed in service.

D. The Auxiliary Building Supply fans must be manually tripped.

ANSWER: %Answer%
If the alarm actuates on the ERA-7300 pump rooms the Operator is required to place the AES Fan Charcoal Filter test Selector Switch to the CHAR FILT position.

A - Incorrect - Auxiliary Building Supply fans are not automatically tripped. (Fuel Pool area fans are tripped on local radiation)
B - Incorrect - The dampers realign for flow through the charcoal filter bed when actuation by the manual selector switch or a Phase B actuation signal occurs.
D -Incorrect - Auxiliary Building Supply are not stopped.
Lesson Plan/Objective: RO-C-02801B/9

Reference: 12-OHP-4024-139, Annunciator Response: Radiation Drop 11 ERS-7300, Data Aquisition Module
Accidental Liquid Radwaste Release
Knowledge of the interrelations between the Accidental Liquid Radwaste Release and the following:
Radioactive-gas monitors
RO-2.7 SRO-2.7

16. 016 2
Answer: C
During a Large Break LOCA, an evaluation of plant status is made during Step 11 of 01-OHP-4023-E-1, Loss of Reactor or Secondary Coolant. Part of this evaluation includes a check of ECCS pump compartment sump alarms and auxiliary building vent stack and area radiation monitors.

Which ONE of the following reasons describes the BASIS for checking these radiation monitors?

A. Determine if local actions can be performed without excessive personnel exposure.

B. Determine if ECCS leakage exceeds that assumed in the control room dose analysis.

C. Determine if a transition should be made to address a LOCA outside of Containment.

D. Collect current radiation values to assist in Emergency Event classification.

ANSWER: %Answer%
Plant sump alarms and radiation monitors are both checked to identify leakage in the auxiliary building. this check is made to determine if the operator should make a transition to 01-OHP-4023-ECA-1.2, LOCA Outside Containment.

A - Incorrect - In-Plant operators are dispatched with radiation protection techs that assess the plant conditions with hand held instruments.
B - Incorrect - Ongoing plant leakage from ECCS equipment is tracked to ensure that assumptions are met.
D - Incorrect - This assessment is done outside of the emergency operating procedure set (EOPs).
Lesson Plan/Objective:Ro-C-EOP09/36

Reference: PSBD Rev. 2, 12-OHP-4023-E-1 Background Document, EOP Step 11 Basis pg. 27

Accidental Liquid Radwaste Release
Knowledge of the reasons for the following responses as they apply to the Accidental Liquid Radwaste Release:
Actions contained in EOP for accidental liquid radioactive-waste release
RO-3.8 SRO-4.3

17. 017 4
Answer: D
Unit 1 and Unit 2 were operating at 100% power with the Unit 1 and Unit 2 East Essential Service Water (ESW) pumps running with the Unit Crossties open.

Given the following sequence of events:
- Unit 2 tripped due to a turbine Electro-Hydraulic Control oil leak.
- Unit 1 remained on line.
- The Unit 2 Reserve Transformers are unavailable.
- Both Unit 2 Emergency Diesel Generators (EDGs) started.
- Buses T21A, T21B, and T21C were energized from the EDGs.
- Bus T21D failed to energize.

Assuming NO operator actions, which ONE of the following describes the ESW cooling water status for the Unit 2 EDGs?

A. 2CD EDG must be tripped immediately as ESW cooling has been lost.

B. 2CD EDG has ESW cooling supplied by the Unit 2 West ESW Pump.

C. 2AB EDG must be tripped immediately as ESW cooling has been lost.

D. 2CD EDG has ESW cooling supplied by the Unit 1 West ESW Pump.

ANSWER: %Answer% - When bus T21D is lost the Unit 2 East ESW Pump Trips, this will cause a low header pressure condition and automatically start the Unit 1 West ESW pump to Supply 2CD EDG with ESW cooling.

A - Incorrect - The Unit 1 West ESW pump will supply ESW Cooling water.
B - Incorrect - The 2CD Diesel Generator could be supplied if the alternate ESW supply was manually opened (recent change).
C - Incorrect - Diesel Generator 2AB has cooling from the auto start of the Unit 2 West ESW Pump (Would also have cooling from the Unit 1 East ESW).

Lesson Plan/Objective: RO-C-01900 / #11

Reference:RO-C-01900 TP-11, Unit 1 Essential Service Water
RO-C-01900 TP-12, Essential Service Water System Overview

Loss of Nuclear Service Water
Ability to operate and/or monitor the following as they apply to the Loss of Nuclear Service Water (SWS):
Loads on the SWS in the control room
RO-3.2 SRO-3.3

18. 018 3
Answer: B
Unit 1 has experienced a Reactor Trip. A Safety Injection was actuated when Pressurizer PORV, NRV-151, opened and did not reclose. Subsequently, the PORV Isolation NMO-151 was closed. The Crew has reset SI and Phase A Containment Isolation and attempted to restore Control Air to Containment by placing control switches for XCR-100, 101, 102, and 103 to the open position.

The following conditions exist:

	Indicating Light Green	Red
XCR-100 Control Air Supply Header No. 2	NOT LIT	NOT LIT
XCR-101 Control Air Supply Header No. 2	NOT LIT	LIT
XCR-102 Control Air Supply Header No. 1	NOT LIT	NOT LIT
XCR-103 Control Air Supply Header No. 1	NOT LIT	LIT

- All Containment Air Pressure Low Alarms - LIT

Which ONE of the following describes the cause of these conditions and the current status of the plant?

A. Phase A has failed to RESET causing a loss of RCS pressure control (PORVs and Sprays won't open).

B. Power has been lost to Train A Air Supply Valves causing a loss of Letdown.

C. Power has been lost to Train B Air Supply Valves causing a loss of Seal Injection.

D. An air leak inside containment has caused isolation of Air Supply valves causing a loss of CCW to the RCPs.

ANSWER: %Answer% - The Letdown line is isolated by air inside containment operated valves QRV-111, 112, 160, 161, and 162.

A - Incorrect - The Pressurizer PORVs, NRV-152 and NRV-153, have backup Air Supplies.
C - Incorrect - RCP Seal Injection is not isolated and Seal Return QCM-250 and QCM-350 are motor operated valves. RCP Seal Leakoff valves QRV-10, 20, 30, and 40 are fail open.
D - An Air would not automatically isolate the air supply. CCW valves to RCPs CCM-458 and CCM-459 would not have isolated and these are motor operated valves. CCW from RCPs CCM-451, 452, 453, and 454 are motor operated valves closed by Phase B.

Lesson Plan/Objective: RO-C-AOP-8 / #17

Reference: 01-OHP-4022-064-002, Loss Of Control Air Recovery, Attachments B-1, 2, and 6
Loss of Instrument Air
Ability to determine and interpret the following as they apply to the Loss of Instrument Air:
Cause and effect of low-pressure instrument air alarm RO-2.9 SRO-3.2

19. 019 3
Answer: C
Which ONE of the following states the reason for depressurizing all intact steam generators as directed by OHP 4023-FR-C.1, Response to Inadequate Core Cooling?

A. Allow more feedwater into the steam generators to enhance Natural Circulation.

B. Inject a sufficient quantity of borated water to provide adequate shutdown margin.

C. Allow the SI Accumulators and the RHR system to inject water into the core.

D. Establish sufficient subcooling to maximize Natural Circulation flow.

ANSWER: %Answer%
The rapid depressurization of the secondary is the most efficient way to reduce primary pressure. Since the High head ECCS pumps are not injecting the attempt is made to lower pressure and inject the Accumulators and allow RHR pumps to inject.

A - Incorrect - In an Inadequate Core Cooling event, RCS inventory is lost to the point that Natural Circulation can no longer remove the heat load and the cooling mechanism shifts to Reflux Cooling.
B - Incorrect - Shutdown Margin is not a concern with Inadequate Core Cooling. If Shutdown margin was lost it would trigger the higher priority Subcriticality FRP.
D - Incorrect - In an Inadequate Core Cooling event, RCS inventory is lost to the point that Natural Circulation can no longer remove the heat load and the cooling mechanism shifts to Reflux Cooling.
Lesson Plan/Objective: RO-C-EOP10/#13

Reference: PSBD rev. 4 12-OHP-4023-FR-C.1 Background Document EOP Step #15 Basis

Inadequate Core Cooling
Knowledge of the interrelations between the Inadequate Core Cooling and the following:
LPI pumps
RO-3.9 SRO-4.1

20. 020 2
Answer: D
Unit 2 was operating at 100% power when a RCS leak developed. The Operators have entered 02-OHP 4022-002-020, Excessive RCS Leakage.

The following conditions exist:
- Letdown flow is isolated.
- East and West Charging pumps are operating.
- Charging flow is 180 gpm.
- Pressurizer level is 51% and constant.
- VCT makeup is in service at the maximum rate.
- VCT level is 22% and lowering.
- Containment pressure is 0.5 psig and constant.

Which ONE of the following describes the required operator action and why?

A. Align CCP suction to the RWST and perform a controlled rapid shutdown per 02-OHP-4022-001-006 Rapid Power Reduction Response, to maintain RCS Tavg-Tref.

B. Restore 75 gpm letdown to ensure proper regen heat exchanger warming of the charging flow.

C. Perform a controlled rapid shutdown per 02-OHP-4022-001-006 Rapid Power Reduction Response since RCS leakage is greater than the Technical Specification Limit.

D. Trip the reactor and transition to 02-OHP-4023-E-0, Reactor Trip or Safety Injection since VCT level can NOT be maintained.

ANSWER: %Answer%
Leakage in excess of VCT makeup will lead to eventual loss of CCP suction. This would be mitigated by the refueling water sequence swapover to the RWST suction source but this would result in excessive boration of the RCS.

A - Incorrect - The procedure directs a Reactor Trip. Temperature control would be extremely difficult.
B - Incorrect - Letdown was isolated to allow Pressurizer level to be stabilized.
C - Incorrect - The procedure directs a Reactor Trip. The VCT would be drained at this rate.
Lesson Plan/Objective: RO-C-AOP-2/AOP2.19

Reference:RO-C-AOP-2, Abnormal Operating Procedures - Day 2 pg. 41
02-OHP-4022-002-020, Excessive Reactor Coolant Leakage pg. 2 and 3

Reactor Coolant System (RCS)
Ability to (a) predict the impacts of the following malfunctions or operations on the RCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Loss of coolant inventory
RO-4.3 SRO-4.4

21. 021 1
Answer: C
During startup, the following plant conditions exist:
- RCS pressure is 2200 psig.
- RCP seal injection flow to each pump is 8 gpm.
- RCP #1 seal leakoff valves are open.
- RCP #1 seal leakoff flow rate is 1.75 gpm.
- RCP #1 pump motor bearing water temperature is approaching the high alarm.

How would the RCP be affected if QRV-150, RCP #1 seal bypass valve, was opened under these conditions?

A. Pressure to the seal return line to the VCT is lowered causing flow across #2 seal to drop.

B. Full RCS pressure is applied to the #3 Seal causing it to become the primary seal.

C. Temperature extremes on the shaft could result in damage to the RCP.

D. Increased flow around the #1 seal will aid in motor bearing cooling.

ANSWER: %Answer%
Opening the valve at NOP would result in a higher flowrate that would be detrimental to the shaft. This would cause temperature extremes over a small area that could lead to bending the shaft. Additionally, this could cause thermal shocking of the seals and shaft on a loss of seal injection.

A - Incorrect - Bypassing the #1 seal should raise the pressure in the VCT return line.
B - Incorrect - #3 seal will NOT see full pressure.
D - Incorrect - Motor bearing temperatures will not be affected.
Lesson Plan/Objective:RO-C-00201/#4

Reference:RO-C-00201 Reactor Coolant Pump System pg. 11, 28, and 29
RO-C-00201 Reactor Coolant Pump System transparencies TP-9 and TP-10

Reactor Coolant Pump System (RCPS)
Ability to manually operate and/or monitor in the control room:
RCP seal bypass
RO-2.6 SRO-2.6

22. 022 2
Answer: C
Unit 1 was operating at 100% power. The West CCP had been tagged out due to a bearing failure.

The following sequence of events occurs:
- A reactor trip and safety injection occurs in response to a Steam Generator Tube Rupture.
- SI is reset.
- The T11D, 4kV AC ESF Bus subsequently loses normal power but is re-energized by the 1CD Emergency Diesel Generator.
- T11D Automatic load sequencing is complete.

Which ONE of the following statements correctly describes the status the East CCP?

The East CCP ...
A. has tripped and automatically restarted.

B. was NOT affected by the loss of Bus T11D.

C. has tripped and may be manually started immediately.

D. has tripped and may NOT be manually started until the load conservation signal resets.

ANSWER: %Answer%
The ECCS timer and SI signals are the only auto starts for the CCPs. The pumps will NOT automatically start following a load shed. The East CCP is powered from T11D while the West CCP is powered from T11A.

A - Incorrect - The pumps will NOT automatically start following a load shed.
B - Incorrect - The East CCP is powered from T11D.
D - Incorrect - The CCP is not prevented from starting due to a load shed.

Lesson Plan/Objective:RO-C-00300/#14 (#9)

Reference: RO-C-00300 Chemical Volume Control System pg. 32
SD-00300 Chemical Volume Control System Description pg. 37

Chemical and Volume Control System (CVCS)
Knowledge of bus power supplies to the following:
Charging pumps
RO-3.3 SRO-3.5

23. 023 1
Answer: D
Hydrogen is supplied to the Volume Control Tank (VCT).

This design feature of the CVCS system is provided to...
A. lower iodine levels in the RCS.

B. control the pH in the RCS.

C. increase demineralizer efficiency for corrosion products.

D. minimize oxygen in the RCS.

ANSWER: %Answer%
Hydrogen is used to scavenge dissolved oxygen from the RCS.

A - Incorrect - Hydrogen does not impact iodine levels.
B - Incorrect - Lithium is used for pH control
C - Incorrect - Hydrogen does not impact demineralizer efficiency
Lesson Plan/Objective: RO-C-00300/#8

Reference:RO-C-00300 Chemical Volume Control System pg. 43 and 44
SD-00300 Chemical Volume Control System Description pg. 29, 67, and 104

Chemical and Volume Control System (CVCS)
Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following:
Oxygen control in RCS
RO-2.8 SRO-3.3

24. 024 6
Answer: B
During implementation of 02-OHP-4023-FR-Z.1, Response to High Containment Pressure, the operators are directed to check for 02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation, actions NOT in effect.

The reason for this verification is that in procedure 02-OHP-4023-ECA-1.1:

A. the initiation of RHR spray is performed prior to 50 minutes following the event to aid in reducing containment pressure.

B. containment pressure is allowed to rise slightly to account for reduced operation of containment spray pumps.

C. containment pressure is allowed to rise to 12 psig with NO containment spray pumps operating.

D. the steam generators are NOT isolated even if faulted to allow for additional RCS cooldown.

ANSWER: %Answer%
Procedure 02-OHP-4023-ECA-1.1 uses less restrictive criteria, which permits reduced spray pump operation depending on RWST level and containment pressure. This is done to conserve RWST inventory.

A - Incorrect - RHR Spray is Never aligned any earlier than 50 minutes.
C - Incorrect - Containment pressure is only allowed to increase to 8 psig with NO Containment Spray Pumps.
D - Incorrect - Faulted SGs would still be isolated.
Lesson Plan/Objective:RO-C-EOP13/#7

Reference:PSBD Rev 2, 12-OHP-4023-FR-Z.1, Background Document pg. 5 Step 2 Basis
02-OHP-4023-ECA-1.1 Loss of Emergency Coolant Recirculation Step 4 pg. 3
RO-C-EOP13, Containment CSFST, FR-Z Series EOPS, and Background Information pg. 26 and 27

Emergency Core Cooling System (ECCS)
Knowledge of the effect that a loss or malfunction of the ECCS will have on the following:
Containment
RO-4.2 SRO-4.4

25. 025 4
Answer: C
Unit 2 was operating at 100% power

<u>The following alarms are received:</u>

- Panel 204
  - Drop 88 - West CCW Surge Tank LVL HI OR LOW
  - Drop 98 - East CCW Surge Tank LVL HI OR LOW
- Panel 207
  - Drop 7, RCP #1 Thermal Barrier Clg Wtr D/P High
  - Drop 8, RCP #1 Thermal Barrier Clg Wtr Temp High
  - Drop 9, RCP #1 Thermal Barrier DP Low
- Panel 238
  - Drop 10, R-17A East CCW Header High Radiation

Which ONE of the following statements is the required action and why? The required actions are to verify CCW vent (2-CRV-412) shut, notify Chem. Lab and RP of high activity, and...

A. trip the reactor and #21 RCP then enter E-0 since the #1 RCP seal has failed.
B. monitor RCP Bearing temperatures since CCW lines in containment have ruptured.
C. close RCP thermal barrier valves (2-CCM-453 and 454) since the #21 RCP thermal barrier has failed.
D. remove letdown from service and place excess letdown in service since the letdown heat exchanger has failed.

ANSWER: %Answer%
Panel 207 Drops 7, 8, & 9 indicate a failure of the RCP Thermal Barrier. These alarms along with the others (Surge tank level and radiation) indicate the need to close the CCW from RCP Thermal Barrier Valves as per 02-OHP-4022-016-003 steps 1 & 2.

A - Incorrect - RCP Seal failure should not impact Surge tank level and temperature.
B - Incorrect - CCW line rupture in Containment would NOT result in High CCW radiation.
D - Incorrect - Letdown would NOT cause Thermal barrier alarms.
Lesson Plan/Objective:RO-C-AOP-4/AOP 4.16 (AOP 4.17)

Reference:02-OHP 4022.016.003, CCW In-Leakage Procedure (Steps 1 -2) pg. 3 and 4
RO-C-AOP-4, Abnormal Operating Procedures - Day 4 pg 47

Component Cooling Water System (CCWS)
Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Consequences of high or low CCW flow rate and temperature; the flow rate at which the CCW standby pump will start
RO-2.5 SRO-2.8

Similar to Master Bank question 12AOPS0417-1

REFERENCES: 01-OHP 4022.016.003, CCW In-Leakage Procedure, Rev. 4

26. 026 5
Answer: A
A steamline break has occurred on Unit 1 SG #11. The break was isolated and Safety Injection (SI) has just been terminated.

The following plant conditions exist:
- East CCP aligned to VCT with normal charging and letdown in service
- SI and RHR pumps shutdown
- RCPs are stopped
- Pressurizer pressure = 1800 psig and rising
- Pressurizer level = 64% and rising
- RCS Core Exit temperature = 503°F and rising
- Containment pressure = 0.1 psi

SG	11	12	13	14
Levels (NR)	0%	13%	20%	20%
Pressures (psig)	0	825	830	830

Which ONE of the following actions are required for plant recovery and why?

A. Open SG PORVs to stabilize the heatup to prevent pressurizer overfill.

B. Raise Charging flow to raise the Pressurizer level to 82% to enable RCP start.

C. Reinitiate High Head SI flow to stop the heatup.

D. Close SG PORVs to allow plant to return to normal temperature and pressure.

ANSWER: %Answer% - Opening the SG PORVs will stabilize the plant heatup and limit the rise in PRZ level (due to RCS expansion).

B - Incorrect - Pressurizer Level is only increased to 82% for an RCP start in the case of RCS voiding. The RCS is adequately subcooled in this situation.
C - Incorrect - High head SI flow is not required to stabilize heatup. High Head SI flow will increase RCS Volume and contribute to the likelihood of an overpressurization of the RCS.
D - Incorrect - Allowing Temperature and pressure to return to normal is undesirable given these conditions.

Lesson Plan/Objective: RO-C-EOP07 / #9

Reference : PSBD Rev. 2 12-OHP-4023-ES-1-1, SI Termination Background Document Step 13 Basis pg. 23
RO-C-EOP07 secondary Side Breaks, E-2 Series EOPs, and Background Information pg. 58, 59, and 61

SI Termination
Knowledge of the reasons for the following responses as they apply to the SI Termination: Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics
RO-3.3 SRO-3.6

27. 027 1
Answer: C
The crew has entered OHP-4023-FR-C-2, Response to Degraded Core Cooling.

<u>The following conditions exist:</u>
- RCS Hot Leg Temperatures are 300°F.
- RVLIS NR indications are 37%.

Which ONE of the following would be most effective in restoring core cooling?
A. Depressurizing SGs to Atmospheric Pressure.

B. Aligning BIT flow from the Opposite Unit.

C. Starting a Residual Heat Removal Pump.

D. Starting a Reactor Coolant Pump.

ANSWER: %Answer% - An RHR pump will provide the greatest injection flow to restore inventory and thus will restore core cooling. At this temperature with the RCS Saturated, pressure will be less than 60 psig resulting in ~3000 gpm from the RHR pump.

A - Incorrect - Further depressurization of the SGs will not significantly add to RCS cooling. With RCS hot leg temperatures at 300°F SG pressures would be ~52 psig. The RCS needs inventory makeup to restore cooling.
B - Incorrect - BIT flow from the opposite unit will be limited to ~ 50 gpm.
D - Incorrect - Without makeup to the RCS starting the RCPs will not significantly add to core cooling.

Lesson Plan/Objective: RO-C-EOP10 / #5

Reference: RO-C-EOP10, Core Cooling and Inventory Critical Safety Functions, FR-C and FR-I Series Procedures, and Background Information pg. 67, 68, and 78
PSBD Rev. 2 12-OHP-4023-FR-C-2, Response to Degraded Core Cooling Background Document Step 19 and 20 Basis pg. 37 and 40

Degraded Core Cooling
Knowledge of the operational implications of the following concepts as they apply to the Degraded Core Cooling:
Components, capacity, and function of emergency systems
RO-3.6 SRO-4.0

28. 028 2
Answer: C
Unit 2 is responding to a Saturated Core Cooling condition IAW 02-OHP-4023-FR-C-3, due to a loss of subcooling following a Reactor Trip and Safety Injection.

<u>The following conditions exist:</u>
- RCS Subcooling - 0°F
- RCS Temperature - 620°F
- RCPs - STOPPED
- RVLIS Narrow Range - 80%

Which ONE of the following choices provides the expected indication of ECCS flow to the RCS, under these conditions?
A. RHR pump discharge flow reads 500 gpm on 2-IFI-310 flow meter.

B. SI pump discharge flow reads 60 gpm on 2-IFI-266 flow meter.

C. Charging pump flow reads 95 gpm on each BIT flow meter.

D. All SI Accumulator pressures dropping slowly.

ANSWER: %Answer%
At 620°F, the RCS pressure is 1772 psig (1787 psia). The charging pumps are the only pumps capable of injecting at this pressure.

A - Incorrect - RHR pumps shutoff head of 200 psid would not allow injection until RCS pressure was much lower.
B - Incorrect - SI pumps shutoff head of 1566 psig would not allow injection until RCS pressure was lower.
D - Incorrect - Accumulator normal pressure band is 620-650 psig, so they would not be able to inject until RCS pressure was below that of the accumulators.

Lesson Plan/Objective:RO-C-00800/#6

Reference:SD-00800 Emergency Core Cooling System Description pg. 27, 38, and 41
RO-C-EOP10, Core Cooling and Inventory Critical Safety Functions, FR-C and FR-I Series Procedures, and Background Information pg.31

Saturated Core Cooling
Ability to operate and/or monitor the following as they apply to the Saturated Core Cooling:
Operating behavior characteristics of the facility
RO-3.2 SRO-3.7

29. 029 1
Answer: A
<u>The following conditions exist:</u>
- Reactor has tripped from 100% power due to a loss of off-site power.
- Natural circulation has been verified.

Which ONE of the following describes the response of core Delta-T if the plant remains in hot standby?

A. Delta T will lower due to the smaller heat generation over time.

B. Delta T will rise as the water in the SGs heats up.

C. Delta T will rise due to lack of cooling to the upper vessel head.

D. Delta T will lower due to the addition of cold AFW to the SGs.

ANSWER: %Answer% - Decay heat production lowers over time. Delta T across the core is determined by the temperature cold leg temperature and the temperature of the fluid exiting the core. Since the fluid exiting the core is subjected to less heating the DT will lower.

B - Incorrect - To maintain natural circulation heat is removed from the SGs so they would not be expected to heat up. Even if they did this would effect the temperature differential between the SG and RCS but not the Delta T across the core.
C - Incorrect - The Reactor vessel head will cool slower than the rest of the vessel due to lower flow. This will not affect the temperature of the water exiting the core (Core Exit Temps).
D - Incorrect - Delta T across the core is determined by the cold leg temperature and the temperature of the fluid exiting the core. The cold AFW may cause cooler water to enter the core but the Delta T is determined by the amount of heat the core adds.

Lesson Plan/Objective:RO-C-EOP03 / #7

Reference: RO-C-EOP03, Plant Trips, Diagnosing Accidents, Natural Circulation Cooldown, E-0 Series EOPs, and Background Information pg. 12 and 71
Natural Circulation Operations
Ability to operate and/or monitor the following as they apply to the Natural Circulation Operations:
Desired operating results during abnormal and emergency situations
RO-3.5 SRO-3.8

30. 030 1
Answer: A
A Loss of Off-Site Power has occurred on Unit 2. The crew is performing the actions of 02-OHP-4023-ES-0.2, Natural Circulation Cooldown.

The following conditions exist:
- RCS temperature is 527°F and trending down at approximately 20°F per hour
- RCS pressure is 1850 psig and trending down slowly
- 2-QRV-251, Charging Flow Control Valve, is fully open
- Pressurizer level is 4% and trending down slowly
- High Steam Flow and Low Pressurizer Pressure SI signals are BLOCKED

Which ONE of the following describes the correct action(s) for these conditions?

A. Actuate Safety Injection and return to 02-OHP-4023-E-0, Reactor Trip or Safety Injection.

B. Transition to 02-OHP-4023-ES-0.3, Natural Circulation Cooldown with a Steam Void in the Vessel.

C. Throttle closed the steam dumps to allow RCS temperature to stabilize IAW 02-OHP-4023-ES-0.2, Natural Circulation Cooldown.

D. Operate SI pumps as necessary to maintain RCS inventory and avoid overfilling the pressurizer IAW 02-OHP-4023-ES-0.2, Natural Circulation Cooldown.

ANSWER: %Answer%
02-OHP-4023-ES-0.2 Foldout page directs this action when pressurizer level cannot be maintained at >5%

B - Incorrect - pressurizer level is already below the SI actuation setpoint and 02-OHP-4023-ES-0.3 is only made after step 13 if a rapid depressurization is required.
C - Incorrect - With a cooldown rate of 20°F, the Charging pump should be sufficient to make up to the pressurizer due to volume changes from the cooldown.
D - Incorrect - the action described would be for post-SI termination in the event of a LOCA
Lesson Plan/Objective:RO-C-EOP03/#23

Reference: RO-C-EOP03, Plant Trips, Diagnosing Accidents, Natural Circulation Cooldown, E-0 Series EOPs, and Background Information pg. 89
02-OHP-4023-ES-0.2 Natural Circulation Cooldown Foldout Page

Natural Circulation Operations
Knowledge of the reasons for the following responses as they apply to the Natural Circulation Operations:
RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated
RO-3.4 SRO-3.6

31. 031 2
Answer: D
A LOCA is in progress and both recirculation sump suction valves (ICM 305 and ICM 306) failed to open while transferring to cold leg recirculation. The crew is currently at step 12.b. RNO of OHP-4023-ECA-1-1, Loss of Emergency Coolant Recirculation.

This step directs the crew to establish minimum ECCS flow to remove decay heat per Figure 1. This is to be accomplished by manually aligning ECCS pumps and throttling BIT discharge to cold leg valves as necessary.

The following conditions exist:

- RWST level is 18% and lowering.
- East CCP, South SI & West RHR pumps are running.
- RCS Pressure is 340 psig.
- Minimum ECCS Flow Required per Figure 1 is 280 gpm.

Which ONE of the following describes how this flow will be established?

A. Shutdown RHR Pump and throttle BIT to 280 gpm of combined CCP and SI pump flow.

B. Shutdown CCP and SI Pumps. RHR pump flow should be about 280 gpm at this pressure.

C. Shutdown SI and RHR Pumps. CCP flow should be about 280 gpm at this pressure without throttling the BIT.

D. Shutdown SI and RHR Pumps and throttle BIT to 280 gpm of CCP flow.

ANSWER: %Answer% - The RHR is shutdown because it is not expected to be delivering flow at this pressure. The SI pump is shutdown because its flow at this pressure would be about 700 gpm. CCP flow at this pressure would be about 550 gpm and so the BIT Valves must be throttled.

A - Incorrect - SI pumps do not flow through the BIT lines so they would be injecting ~ 700 gpm.
B - Incorrect - RHR Pumps are not expected to inject at this pressure. CCP would be required.
C - Incorrect - CCP flow is expected to be ~ 550 gpm at this pressure.

Lesson Plan/Objective: RO-C-EOP09 / #26

Reference: OHP-4023-ECA-1-1, Loss of Emergency Coolant Recirculation pg. 17
UFSAR Table 6.2-5 Design Parameters - ECCS pumps

Loss of Emergency Coolant Recirculation
Ability to operate and/or monitor the following as they apply to the Loss of Emergency Coolant Recirculation:
Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features
RO-3.9 SRO-4.0

32. 032 1
Answer: D
While responding to a LOCA, a transition to OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation, was performed due to a loss of emergency coolant recirculation.

The following conditions exist:
- RWST level is 18% and lowering.
- Containment Pressure is 2.5 psig
- All ECCS pumps are running.
- Both CTS pumps were stopped.
- RCS Pressure is 940 psig.

Make up is being added to the RWST and ECCS is reduced to one train of SI flow.

What are these actions designed to do?
A. Restore RWST level so Containment Spray can be started.

B. Prevent damage to vital equipment by saving one ECCS train.

C. Establish conditions to allow restart of RCPs.

D. Delay the time to RWST depletion.

ANSWER: %Answer%
Makeup is added to the RWST to extend time the ECCS pumps can take suction from the RWST and supply core cooling. Reducing to one train of ECCS flow (1 CCP, SI, & RHR) delays the time to RWST depletion.

A - Incorrect - CTS is operated based on Containment Pressure. CTS is not required below 3 psig.
B - Incorrect - The reason for the ECCS reduction is to delay RWST depletion. The procedure provides direction to stop ALL ECCS pumps prior to damage from low RWST level.
C - Incorrect - These actions are NOT performed to allow the restart of RCPs. The RCPs will be started in step 11 (immediately after reducing ECCS to 1 train in Step 10) if subcooling is sufficient.
Lesson Plan/Objective: RO-C-EOP09/#36

Reference: PSBD Rev. 1 12-OHP-4023-ECA-1.1 Loss of Emergency Recirculation Background Document Step 6 and 10 Basis pg. 18 and 29
RO-C-EOP09, LOCAs, E-1 Series EOPs, and Background Information pg. 93

Loss of Emergency Coolant Recirculation
Knowledge of the interrelations between the Loss of Emergency Coolant Recirculation and the following:
Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility
RO-3.9 SRO-4.3

33. 033 2
Answer: C
Operators are performing 02-OHP-4023-ECA -2.1, Uncontrolled Depressurization of All Steam Generators due to a steam leak inside containment along with failure of all SG stop valves to close.

The following plant conditions exist:
- Cooldown rate is 155^{O} F per hour.
- RCS cold leg temperatures are 340^{O} F
- Containment pressure is 8 psig.
- Narrow range Steam Generator levels indicate offscale low.
- Steam Generator AFW flow indicates 170x10^{3} pph each SG.

Which ONE of the following choices is correct for these plant conditions ?

A. Adjust AFW flow to 60x10^{3} pph on each Steam Generator.

B. Adjust AFW flow to 25x10^{3} pph on each Steam Generator, after at least one SG narrow range level is greater than 13%.

C. Adjust AFW flow to 25x10^{3} pph on each Steam Generator.

D. Isolate AFW flow to three of the Steam Generators.

ANSWER: %Answer%
AFW flow should be reduced to 25x10^{3} pph on each Steam Generator if the cooldown rate is > 100^{O}F per hour.

A - Incorrect - The 240x10^{3} pph (60/SG) is the normal minimum required for heatsink. With the reduced RCS temperature and cooldown rate this is not required at this time.
B - Incorrect - Flow is throttled irregardless of level. The minimum is 25x10^{3} pph when < 13% (Note the number is 24% for Adverse Containment which applies in this case.).
D - Incorrect - A minimum is 25x10^{3} pph is required to each SG when < 13% to minimize thermal shock.
Lesson Plan/Objective:RO-C-EOP07/#8

Reference:02-OHP-4023-ECA-2.1, Uncontrolled Depressurization of All Steam Generators Step 2 pg. 4
RO-C-EOP07, Secondary Side Breaks, E-2 Series EOPs, and Background Information pg. 97 and 98

Uncontrolled Depressurization of all Steam Generators
Knowledge of the interrelations between the Uncontrolled Depressurization of all Steam Generators and the following:
Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility
RO-3.6 SRO-3.9

34. 034 2
Answer: D
Unit 2 was operating at 95% power when a load rejection occurred.

Shortly after the load rejection the following plant conditions exist:
- RCS Tavg is 572^{O} F
- Pressurizer Level is 54%
- Pressurizer vapor temperature is 650^{O} F
- Pressurizer liquid temperature is 649^{O} F

Which ONE of the following is the current status of the pressurizer based on these conditions? (Reference the steam tables)

A. Pressurizer PORVs and Spray valves are full OPEN.

B. Pressurizer Spray valves are modulated OPEN.

C. Pressurizer proportional heaters are modulated ON.

D. Pressurizer Backup and proportional heaters are fully ON.

ANSWER: %Answer%

Pressurizer vapor space of 650^{O}F equates to 2193 psig (2208 psia). This is below the 2210 psig setpoint to fully energize the backup heaters.

A - Incorrect - Pressure would need to be > 2335 psig (659^{O}F)
B - Incorrect - Pressure would need to be 2260-2310 psig (654-657^{O}F)
C - Incorrect - Pressure would need to be > 2220 psig (652^{O}F)
Lesson Plan/Objective:RO-C-00202/#6

Reference: Steam Tables
SD-00202 Pressurizer and Pressure Relief System Description Figure 15

Pressurizer Pressure Control System (PZR PCS)
Knowledge of the operational implications of the following concepts as they apply to the PZR PCS:
Determination of the condition of fluid in PZR, using steam tables.
RO-3.5 SRO-4.0

Reference Provided - Steam Tables

35. 035 1
Answer: A
During the performance of an NIS power range heat balance at 100% power, an operator uses a feedwater temperature 30^{O}F lower than actual.

Would the calculated value of power be HIGHER or LOWER than actual power, and would an adjustment of the NIS power range channels, based on this value, be CONSERVATIVE or NON-CONSERVATIVE with respect to High Power Reactor Trip protection setpoints?

	Calculated Power	Setpoints
A.	Higher	Conservative
B.	Higher	Non-Conservative
C.	Lower	Conservative
D.	Lower	Non-Conservative

ANSWER : %Answer% - A Lower FW temperature means more energy must be added to the FW to produce Steam. This will make it look like a higher reactor power and setting NI's at a higher value would be conservative (Lead to an earlier trip and/or require the plant to operate at a lower thermal power).

B - Incorrect - Calculated power would be higher but setting the NI's to a higher value is conservative with respect to protection setpoints.
C - Incorrect - Calculated power would be higher.
D - Incorrect - Calculated power would be higher.

Lesson Plan/Objective: RO-C-GF19 / #14

Reference: RO-C-GF19, Heat Transfer

Reactor Protection System
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPS controls including:
Trip setpoint adjustment
RO-2.9 SRO-3.4

36. 036 2
Answer: C
Unit 1 was operating at 100% power. A small break LOCA occurs resulting in automatic reactor trip and safety injection.

The following conditions exist:
- RCS pressure has just stabilized at 1200 psig.
- Core Exit Thermocouples indicate 565^{O}F
- SI pump flows are 0 gpm
- BIT injection flows are 0 gpm

Which ONE of the following describes the effect this will have on core cooling?
A. Adequate core cooling will be maintained if the RHR pumps function as designed.

B. Inadequate core cooling and core damage will result even if BIT and SI flow is subsequently restored.

C. Inadequate core cooling and core damage will result unless BIT or SI flow is subsequently restored.

D. Adequate core cooling will be maintained as long as steam generator levels are maintained in the narrow range.

ANSWER: %Answer%
With RCS pressure stabilized at 1200 psig and no High Head Injection flow, mass loss continues. Eventually enough mass will be lost that significant voiding occurs and no core cooling takes place leading to fuel damage.

A - Incorrect - The RHR pumps will not inject at this pressure. Voiding will occur.
B - Incorrect - The RCS has just reached saturated conditions as indicated by CETCs and stabilized pressure. Restoration of High head SI will restore inventory and preclude damage.
D - Incorrect - High Head SI is required to restore inventory to allow cooling in conjunction with a secondary heat sink.
Lesson Plan/Objective:RO-C-EOP09/#8

Reference: RO-C-EOP09, LOCAs, E-1 Series EOPs, and Background Information pg.147 and 148

Engineered Safety Features Actuation System (ESFAS)
Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following:
Fuel
RO-4.4 SRO-4.7

37. 037 3
Answer: C
The following conditions exist:
- Containment pressure instrument Channel #3, 2-PPP-301 (PT-935) declared inoperable.
- Required actions per 02-OHP-4022-013-011 Containment Instrumentation Malfunction have been completed.
- Required Technical Specification Actions have been taken for Channel #3, 2-PPP-301 (PT-935)

Which ONE of the following describes the REMAINING coincidence for the SAFETY INJECTION ACTUATION and CTS ACTUATION?

Remaining Channels to cause actuation
Remaining Channels with INPUT to this function

	SAFETY INJECTION ACTUATION	CTS ACTUATION
A.	2/3	2/3
B.	1/3	1/3
C.	1/2	2/3
D.	1/2	1/3

ANSWER: %Answer%
The CTS Actuation Bistable is placed in the BYPASSED condition to prevent inadvertent actuation. This changes the remaining channel coincidence to 2/3 instead of the previous 2/4. Only 3 channels (Channels 2, 3, & 4) feed the SI Actuation (including this channel). The bistable for the SI actuation is placed in the TRIP condition.

A - Incorrect - This channel feeds the SI Actuation. (True if candidate assumes this channel does not feed SI or that both bistables are bypassed.)
B - Incorrect - Only 3 total including this channel feed SI. CTS is bypassed. (True if candidate assumes 4 channels feed SI and that CTS is bypassed)
D - Incorrect - The CTS is placed in BYPASS. (True if candidate assumes that CTS is tripped)

Lesson Plan/Objective:RO-C-01100/#6

Reference: RO-C-AOP-2, Abnormal Operating Procedures - Day 2 pg. 16 and 17
02-OHP-4022-013-011 Containment Instrumentation Malfunction pg. 2 and 5

Engineered Safety Features Actuation System (ESFAS)
Knowledge of the effect of a loss or malfunction of the following will have on the ESFAS:
Sensors and detectors
RO-2.7 SRO-3.1

38. 038 1
Answer: B
A reactor Startup is in progress on Unit 1. The crew has just completed recording critical data. When the RO begins to withdraw control rods to raise reactor power, the IR NIS indication suddenly drops by 1/3 decade and continues to decrease at a negative (-).3 DPM.

The following conditions exist:
- There is no significant change in RCS Tave.
- The Control Bank D step counters now read 131 steps for both D1 and D2 groups.
- IRPI indicators for Control Bank D1 Rods D-4, D-12, M-4, and M-12 indicate 0 steps.

Which ONE of the following has occurred based on these indications?
A. Either the control bank D group step counter or IRPI indicators have failed, but not enough information is provided to determine whether any rods have dropped.

B. The control bank step counters and associated IRPI indicators, along with the NIS indications are consistent with multiple dropped rods.

C. An ATWS condition has occured since more than a single dropped rod would have resulted in a reactor trip.

D. The control bank D group step counter has failed, it should also read 0 steps if the rods in this group are fully inserted.

ANSWER: %Answer%
The IPRI indications and the lowering NIS indicates that multiple rods have dropped. The reactor did not trip automatically (<5% PR change). The operator will need to trip manually.

A - Incorrect - The IPRI indications and the lowering NIS indicates that multiple rods have dropped.
C - Incorrect - The reactor did not trip automatically because power is too low to receive a negative rate trip. (<5% PR change). The operator will need to trip manually.
D - Incorrect - The Group step counter indicates demand position.
Lesson Plan/Objective:RO-C-01200/#23

Reference:RO-C-AOP-6, Abnormal Operating Procedures – Day 6 pg. 59 and 60

Rod Position Indication System (RPIS)
Knowledge of the physical connections and/or cause-effect relationships between the RPIS and the following systems:
NIS
RO-3.0 SRO-3.3

39. 039 2
Answer: A
Unit 1 is conducting a reactor startup following a refueling outage.

The following conditions exist:
- Source Range Instrument N-31 indicates 2.1×10^{4} cps.
- Source Range Instrument N-32 indicates 2.0×10^{4} cps.
- Intermediate Range Instrument N-35 indicates 2.5×10^{-11} amps.
- Intermediate Range Instrument N-36 indicates 1.0×10^{-9} amps.
- Rods are in manual with no rod motion.
- Source Range and Intermediate Range Nuclear Instruments are slowly rising.

Which ONE of the following best explains the indications?

A. N-35 compensating voltage is set too high

B. N-35 compensating voltage is set too low

C. N-36 compensating voltage is set too high

D. N-36 compensating voltage is set too low

ANSWER: %Answer% - N-35 reads too low for the conditions given, compensating voltage is too high.

B - Incorrect - N-35 reads too low.
C - Incorrect - Overlap is proper for N-36.
D - Incorrect - Overlap is proper for N-36.

Lesson Plan/Objective:RO-C-01300/#9

Reference:SD-01300 Excore Nuclear Instrumentation System Description Figure 5
RO-C-01300, Excore Nuclear Instrumentation System Handout #3 pg.3

Nuclear Instrumentation System
Knowledge of the effect of a loss or malfunction of the following will have on the NIS:
Discriminator/compensation circuits
RO-2.6 SRO-2.9

40. 040 3
Answer: B
Unit 2 is operating at 100% power. The 43-TSAT-2 Thermocouple Selector Switch is selected to use a single thermocouple (Auctioneering function is NOT Working).

The following conditions exist:
- Subcooling Meter is in the T-SAT-T/C position
- Subcooling Meter indicates " 425"
- RCS T_{hot} indicates 608^{O}F
- RCS pressure indicates 2200 psig

Which ONE of the following statements describes these indications and the required actions?
A. A T/C wiring SHORT is causing the thermocouple to read HIGH. The operator should select another T/C, the T-SAT-RTD position or use PPC values.

B. A T/C wiring OPEN is causing the thermocouple to read LOW. The operator should select another T/C, the T-SAT-RTD position or use PPC values.

C. A T/C wiring SHORT is causing the thermocouple to read HIGH. The operator should defeat the failed thermocouple at the Incore TC Recorder.

D. An T/C wiring OPEN is causing the thermocouple to read LOW. The operator should defeat the failed thermocouple at the Incore TC Recorder.

ANSWER: %Answer%

A failed OPEN TC will indicate LOW (200^{O}F) causing the meter to read "425" or excessive subcooling. Selecting another T/C will restore the expected reading. Selecting the T-SAT-RTD position allows the use of the RTDs for calculation. The PPC also provides indications of individual TCs and calculations that use the Average TC margin to saturation.

A - Incorrect - A short will cause the TC to indicate low (200^{O}F). A high reading would indicate an "OL" or a negative number indicating saturation.
C - Incorrect - A short will cause the TC to indicate low (200^{O}F). A high reading would indicate an "OL" or a negative number indicating saturation. TCs are not defeated from the recorder.
D - Incorrect - TCs are not defeated from the recorder.
Lesson Plan/Objective:RO-C-01301/#12

Reference: RO-C-01301, Incore Nuclear Instrumentation System pg. 33 and 34
RO-C-GF27, Sensors and Detectors pg. 24 and 25

In-Core Temperature Monitor (ITM) System
Ability to (a) predict the impacts of the following malfunctions or operations on the ITM System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Thermocouple open and short circuits
RO-3.1 SRO-3.5

41. 041 2
Answer: D
Unit 2 has just tripped due to a Loss of Offsite power. Both EDGs started and energized the required loads. All equipment responded as designed.

The following conditions exist:
- Containment parameters are normal
- Average core exit thermocouple (CET) temperature is stable.

Which ONE of the following combination of RCS pressure and average CET temperature verifies the MINIMUM required subcooling to AVOID Safety Injection per 02-OHP-4023-ES-0.2, Natural Circulation Cooldown?

A. 600 psig, 590^{O}F

B. 500 psig, 460^{O}F

C. 450 psig, 430^{O}F

D. 375 psig, 400^{O}F

ANSWER: %Answer%

02-OHP-4023-ES-0.2 requires >36^{O}F of subcooling or requires that a SI be actuated.

02-OHP-4023-SUP-001 adds 10^{O}F to the T/C average for instrument uncertainties. This requires the T/C to be 46^{O}F below Tsat for the given pressure.

A - Incorrect - RCS is saturated - Tsat is 489^{O}F

B - Incorrect - RCS is 10^{O}F subcooled - Tsat is 470^{O}F

C - Incorrect - RCS is 30^{O}F subcooled - Tsat is 460^{O}F
Lesson Plan/Objective:RO-C-EOP03/#18

Reference:02-OHP-4023-ES-0.2, Natural Circulation Cooldown Foldout Page
02-OHP-4023-SUP-001, Subcooling Margin determination pg. 3 and 4
RO-C-EOP03, Plant Trips, Diagnosing Accidents, Natural Circulation Cooldown, E-0 Series EOPs, and Background Information pg.. 8 and 89

In-Core Temperature Monitor (ITM) System
Knowledge of the operational implications of the following concepts as they apply to the ITM System:
Saturation and subcooling of water
RO-3.7 SRO-4.0

Provide Steam Tables

42. 042 2
Answer: C
Given the following conditions concerning the Ice Condenser Cooling System:

Aligned to Unit 1 - Glycol Pumps 1 and 2 running with #3 in Auto.
Refrigeration Chiller Unit 1 in SEQUENCE MODE
Refrigeration Chiller Units 7 and 8 in BASE LOAD

Aligned to Unit 2 - Glycol Pumps 5 and 6 running with #4 in Auto.
Refrigeration Chiller Unit 3 in SEQUENCE MODE
Refrigeration Chiller Units 4, 5, and 6 in BASE LOAD

The NESW piping to the #5 and #6 Chillers starts leaking which causes a loss of NESW flow to both chillers.(NESW flow to the all other chillers is not significantly impacted) This also causes a trip of Glycol Pump #2 due to water spraying on the motor.

Which ONE of the following describes the resulting status of the Ice Condenser Cooling System? Assume NO operator action.

A. U1 - Chiller Units 7 and 8 operating, Glycol pump #3 starts; U2 - Chiller Units 3, 4, 5, and 6 tripped, U2 Containment Isolation Glycol valves closed.
B. U1 - Chiller Units 7 and 8 operating, U2 Crossties open, Glycol pump #3 starts; U2 - Chiller Units 5 and 6 tripped, Chiller Units 1 and 3 pick up cooling load for U2, Glycol pump #4 starts.
C. U1 - Chiller Units 7 and 8 operating, Glycol pump #3 starts; U2 - Chiller Units 5 and 6 tripped, Chiller Unit 3 picks up cooling load for U2.
D. U1 - Chiller Units 7 and 8 tripped, Chiller Unit 1 picks up cooling load for U1, Glycol pump #1 alone supplies required flow; U2 - Chiller Units 5 and 6 tripped, Chiller Unit 3 picks up cooling load for U2.

ANSWER: %Answer% - Loss of NESW flow will cause the associated Chiller to trip. The Standby pump will auto start if the operating pump trips. In Sequence Mode the chillers will increase load based on cooling requirements.

A - Incorrect - Chiller Units 7 and 8 won't trip on the loss of a single pump, standby pump #3 will start.
B - Incorrect - Chiller units 3 and 4 won't trip. Containment Isolation valves close on Lo-2 glycol tank level and Containment Isolation Signals but not on chiller or pump trips.
C - Incorrect - Unit crossties do not automatically open. Glycol Pump 4 would not auto start.

Lesson Plan/Objective:RO-C-01000 / #8

Reference: SD-01000, Ice Condenser System Description pg. 46-48
RO-C-01000, Ice Condenser System pg. 22,23, and 28
OHP 4021.010.001, Operation of the Ice Condenser Refrigeration System

Ice Condenser System
Ability to monitor automatic operation of the Ice Condenser System, including:
Refrigerant system
RO-3.0 SRO-3.0

43. 043 2
Answer: D
A Unit 2 LOCA event is in progress.

<u>The following conditions exist:</u>
- Containment Pressure is 4.5 psig and rising
- East CCP Leakoff 2-QMO-225 White Light - LIT
- West CCP Leakoff 2-QMO-226 White Light - LIT
- NESW and CCW to/from RCPs Green lights - LIT
- ALL CTS monitor lights on 2-SML-9A - LIT
- ALL CTS monitor lights on 2-SML-9B - NOT LIT

Based on these indications, which ONE of the following statements describes the failure and required operator actions?

A. Only train B of Containment Spray has failed to Actuate.
Manually align Train B Containment Spray Pump and Valves as required.

B. Containment Isolation Phase B has failed to Actuate.
Perform OHP 4023.SUP.004, Phase B Isolation Checklist.

C. Safety Injection has failed to Actuate.
Manually align Safety Injection Pumps and Valves as required.

D. Both Trains of Containment Spray have failed to Actuate.
Turn Both Containment Spray Actuation switches to Actuate.

ANSWER: %Answer%
Normal Indication of proper CTS operation would be CTS monitor Lights 2-SML-9A and 9B - LIT. With NO CTS operating when required (>3 psig in Containment), the Operator is required to Actuate both CTS Actuation switches.

A - Incorrect - 2-SML-9A is normally lit while 2-SML-9B is lit during CTS alignment. The lights are NOT train specific but condition specific.
B - Incorrect - The NESW and CCW green lights indicate Phase B Isolation. (Manual isolation is attempted prior to SUP-004)
C - Incorrect - QMO-225 and 226 White lights indicate SI actuated.

Lesson Plan/Objective:RO-C-00900/#12

Reference:RO-C-00900 Containment Spray and Hydrogen Recombiner pg. 13 and 14
02-OHP-4023-E-0, Reactor Trip or Safety Injection Step 5 pg. 7

Containment Spray System (CSS)
Ability to (a) predict the impacts of the following malfunctions or operations on the CSS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Failure of ESF
RO-4.1 SRO-4.4

44. 044 1
Answer: A
Unit 1 has experienced a LOCA and Loss of Offsite power.

The following conditions exist:
- Emergency Diesel Generator 1AB failed to start.
- Emergency Diesel Generator 1CD has started and loaded as designed.
- The division has restored power to the Reserve Aux Transformers.
- No buses have been energized from the RATs.

The Unit Supervisor directs you to verify or restore power so a hydrogen recombiner may be run.

Which ONE of the following actions is required to enable the associated Hydrogen Recombiner to be operated?

A. Verify that bus T11C has energized 600V Bus 11C and MCC-1-EZC-C for (Train A) Hydrogen Recombiner Number 2.

B. Verify that bus T11C has energized 600V Bus 11C and Close the 11AC crosstie to supply power to Bus 11A and MCC-1-EZC-A for (Train B) Hydrogen Recombiner Number 1.

C. Energize RCP Bus 1B from the RAT to supply power to 600V Bus 11BMC for (Train B) Hydrogen Recombiner Number 1.

D. Energize RCP Bus 1C from the RAT to supply power to 600V Bus 11CMC for (Train A) Hydrogen Recombiner Number 2.

ANSWER: %Answer%
Hydrogen Recombiner #1 is powered form MCC-1-EZC-B and Hydrogen Recombiner #2 is powered form MCC-1-EZC-C.

B - Incorrect - Hydrogen Recombiner #1 is powered form MCC-1-EZC-B
C - Incorrect - Hydrogen Recombiner #1 is powered form MCC-1-EZC-B
D - Incorrect - Hydrogen Recombiner #2 is powered form MCC-1-EZC-C
Lesson Plan/Objective:RO-C-00900/#9

Reference:SD-00900 Containment Spray and Hydrogen Recombiner System Description pg. 40

Hydrogen Recombiner and Purge Control System (HRPS)
Knowledge of bus power supplies to the following:
Hydrogen recombiners
RO-2.5 SRO-2.8

45. 045 2
Answer: B
Unit 2 is in Mode 6 - Refueling with Fuel Movement in progress.

<u>The following conditions exist at 0100:</u>
- Source range channels N31 and N32 are operable.
- Source range channel N31 is selected for audible function.
- Gamma-Metrics channels N21 and N23 are operable.

<u>Given the following events and times</u>:
- At 0200, Source range channel N32 fails.
- At 0300, Source range channel N31 fails.
- At 0400, Gamma-Metrics channel N21 fails.
- At 0500, Gamma-Metrics channel N23 fails.

Which ONE of the following is the earliest time that core alterations must be suspended?

A. 0200

B. 0300

C. 0400

D. 0500

ANSWER: %Answer% - Tech Spec 3.9.2 requires 2 operable source range channels. Wide range flux monitors (gamma metrics) are allowed to substitute for NIS source flux monitors. BUT the gamma metrics do NOT provide an audible function.

A - Incorrect - Wide range flux monitors (gamma metrics) are allowed to substitute for NIS source flux monitors. 2 WR and 1 SR with Audible are operable.
C - Incorrect - Gamma metrics do NOT provide an audible function.
D - Incorrect - 2 Channels and an Audible are required.

Lesson Plan/Objective: RO-C-ADM13/ADM13.3.0

Reference: Tech. Spec. 3.9.2; 02-OHP-4030-STP-037, Refueling Surveillance, Data Sheet 3, Item 2

Fuel Handling Equipment System (FHES)
Ability to manually operate and/or monitor in the control room:
Neutron levels
RO-3.5 SRO-3.9

46. 046 3
Answer: D
Given the following plant conditions:

- Unit 1 is at 100% power and stable.
- Steam Generator Level Controls are in AUTOMATIC.
- Steam Generator #12 Steam Flow Channel 1, 1-MFC-121, is selected to the Steam Generator Level Control System.

An unidentified calibration error results in Steam Generator #12 Steam Flow Channel 2, 1-MFC-120, indicating 10% low (indicates 90% vs 100% Steam Flow). When requested by MTI, operators switch the controlling Steam Flow channel to 1-MFC-120.

Which ONE of the following conditions will occur when the operator switches the controlling channel? (Assume all controllers remain in Automatic)

The Steam Generator Level Control system will:
A. initially lower feed flow, then control #12 SG level approximately 10% below program level.

B. not change feed flow to the #12 SG, but Feedwater delta-P program will be lowered to the 90% power value.

C. initially raise feed flow to #12 SG, then return level to program. The Feedwater delta-P program will be lowered to the 90% power value.

D. initially lower feed flow, then control #12 SG level at approximately program level.

ANSWER: %Answer% - SG FW flow will initially lower to match the lower Steam Flow, As a level deviation error builds in it will raise FW flow to restore level to the desired SG Level Setpoint. (Level Error is added to Steam Flow)

A - Incorrect - SG level setpoint is fixed and is not impacted by the SF channel.
B - Incorrect - SG FW flow will be affected & FW DP program will only be affected ~2.5% power since all 4 channels are summed.
C - Incorrect - FW flow will not raise and FW DP program will only be affected ~2.5% power since all 4 channels are summed.

Lesson Plan/Obj: RO-C-05100 / #9

Reference: SD-05100, Steam Generator System Description pg. 20-21 & 57-59

Steam Generator System (S/GS)
Ability to monitor automatic operation of the S/G, including:
S/G water level control
RO-4.0 SRO-3.9

47. 047 1
Answer: D
The plant is in a normal cooldown and preparing for a refueling outage. A misoperation of the Steam Generator Power Operated Relief Valves causes the cooldown rate to exceed Technical Specification limits.

Which of the following actions is required and why?

A. Restore cooldown rate to Tech. Spec. limits within 1 hour to provide adequate margin from ductile failure of the Reactor vessel.

B. Stop any further cooldown for 6 hours to allow temperature stabilization throughout the vessel wall.

C. Stop any further cooldown for 12 hours to allow temperature stabilization throughout the vessel wall.

D. Restore cooldown rate to Tech. Spec. limits within 30 minutes to provide adequate margin from brittle failure of the Reactor vessel.

ANSWER: %Answer%
Technical Specification 3/4.4.9.1 requires the RCS temperature to be restored to within Limits in 30 minutes. The concern of excessive cooldown rates to brittle failure caused by the tensile stresses on the inner wall.

A - Incorrect - Time to restore is 30 minutes. Concern is brittle failure.
B - Incorrect - Time to restore is 30 minutes. While soak time would aid the situation, this is NOT a required action and the time is excessive.
C - Incorrect - Time to restore is 30 minutes. While soak time would aid the situation, this is NOT a required action and the time is excessive.
Lesson Plan/Objective:RO-C-GF23/#14

Reference: Technical Specification 3/4.4.9.1 Pressure/Temperature Limits pg. 3/4 4-24
RO-C-GF23 Brittle Fracture and Vessel Thermal Stress pg. 53

Main and Reheat Steam System (MRSS)
Knowledge of the operational implications of the following concepts as they apply to the MRSS:
Bases for RCS cooldown limits
RO-2.7 SRO-3.1

48. 048 1
Answer: B
During the final stages of an RCS heatup, the Steam Dump System is set to automatically control RCS temperature at 541^{O}F.

Which ONE of the following is the correct Steam Dump Pressure Controller setpoint required to maintain RCS temperature at approximately 541^{O}F Tavg?

A. 940 psig

B. 955 psig

C. 970 psig

D. 985 psig

ANSWER: %Answer%
955 psig is Psat for 541°F.

A - Incorrect - 940 psig is Psat for 539°F.
C - Incorrect - 970 psig is Psat for 543°F.
D - Incorrect - 985 psig is Psat for 545°F.

Lesson Plan/Objective: RO-C-05200 / #9

Reference: Steam Tables; 02-OHP-4021-001-001, Plant Heatup From Cold Shutdown To Hot Standby pg. 29, 38, 45, and 46

Steam Dump System (SDS) and Turbine Bypass Control
Knowledge of the operational implications of the following concepts as they apply to the SDS:
Use of steam tables for saturation temperature and pressure.
RO-2.5 SRO-2.8

49. 049 1
Answer: D
Unit 2 is at 56% power with all control systems in AUTOMATIC.

Which ONE of the following describes the plant response to a trip of the East Main Feed Pump? Assume NO operator action and NO plant trip occurs.
As SG water levels start lowering, ...

A. the feedwater header pressure lowers, causing the West MFP speed to rise until it trips on overspeed. Both the Steam-driven and Motor-driven Auxiliary Feedwater Pumps start when SG levels reach the Low-Low level setpoint.

B. the Feedwater Regulating Valves open further, the West MFP speed rises, the Low Pressure Heater Bypass CRV-224 opens and the Middle Heater Drain Pump starts due to low Main FW Pump Suction Pressure.

C. the West MFP speed rises but will not maintain SG level. Both the Steam-driven and Motor-driven Auxiliary Feedwater Pumps start when SG levels reach the Low-Low level setpoint.

D. the Feedwater Regulating Valves open further and the feedwater header pressure lowers causing the West MFP speed to rise. NO automatic pump starts occur.

ANSWER: %Answer%
On the loss of the East Main FW Pump, reduced flow will cause the FW regulating valves will open further as the SGs try to maintain normal level & FW flow matched to steam flow. FW Pump Discharge pressure will decrease and the FW pp vs. Steam pressure Delta P will cause the West FW pump speed to increase to restore programmed Delta Pressure.

A - Incorrect - The Main FW pumps can supply 60% flow and so the West FW pump would not trip on overspeed.
B - Incorrect - The Heater Drain pump will not auto start nor will the LP Heater Bypass Open since pressure will not significantly decrease because the total amount of FW flow required does not change.
C - Incorrect - The Main FW pumps can supply 60% flow and so a Low-Low level would not be reached and AFW will not start.
Lesson Plan/Objective:RO-C-AOP-3 / #AOP3.15

Reference: RO-C-05500 Main Feedwater System pg. 10, 18, and 19
02-OHP-4022-055-001, Loss Of One Main Feed Pump pg. 2

Main Feedwater (MFW) System
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW System controls including:
Power level restrictions for operation of MFW pumps and valves
RO-2.7 SRO-2.9

50. 050 7
Answer: B
The control room operators are responding to a red path on the Heat Sink CSF caused by a loss of all Auxiliary Feed Pumps.

The following plant conditions exist:
- All RCPs have been tripped.
- East CCP is tripped
- West CCP is operating
- Containment Pressure is 0.8 psig
- Control Air to Containment remains isolated due to an air leak.
- SG #

SG #	11	12	13	14
Wide Range Level %	32	21	25	28

The AEO reports that the Turbine Driven Auxiliary Feed Pump should be restored within 10 minutes. Which ONE of the following describes the correct operator response? (01-OHP-4023-FR-H.1, Response To Loss of Secondary Heat Sink attached)

A. Immediately initiate bleed and feed. Terminate bleed and feed as soon as AFW flow is restored.
B. Immediately initiate bleed and feed. Continue bleed and feed until AFW flow has restored at least one SG NR Level.
C. Continue efforts to restore AFW flow. Do NOT initiate bleed and feed until 3 SG levels are less than 15%.
D. Continue efforts to restore AFW flow. Do NOT initiate bleed and feed until 2 SG levels are less than 15%.

ANSWER: %Answer%
Bleed and feed must be initiated immediately upon reaching the criteria. The effectiveness depends on the timeliness of initiation. Only 2 PRZ PORVs are available since air is lost to Containment. This requires bleed and feed to be initiated when 2 SG levels are <30% (Step 3). Bleed and feed is continued until at least 1 SG is >8% (step 30).

A - Incorrect - RCS feed and Bleed is NOT stopped until at least 1 SG is >8%.
C - Incorrect - Bleed and feed must be initiated immediately upon reaching the criteria. The effectiveness depends on the timeliness of initiation. (Plausible if candidate assumes 3 PORVs and Normal Containment)
D - Incorrect - Bleed and feed must be initiated immediately upon reaching the criteria. The effectiveness depends on the timeliness of initiation.(Plausible if candidate assumes 3 PORVs and keys on the step that says at least 2 levels > 15%)
Lesson Plan/Objective: RO-C-EOP11/#7

Reference: 01-OHP-4023-FR-H.1, Response To Loss of Secondary Heat Sink pg. 3 & 32; RO-C-EOP11, Heat Sink CSFST, FR-H Series EOPs, and Background Information pg. 27, 28, 34, and 35

Auxiliary / Emergency Feedwater (AFW) System
Knowledge of the effect that a loss or malfunction of the AFW System will have on the following: RCS RO-4.4 SRO-4.6
Reference Provided - 01-OHP-4023-FR-H.1, Response To Loss of Secondary Heat Sink

51. 051 3
Answer: C
Unit 1 is in Mode 3. The 4160 VAC distribution system is being supplied by the Reserve Auxiliary Transformers (RATs). Due to a system disturbance, indicated voltage on the safeguards buses drops.

<u>The following conditions exist:</u>
- T11A Voltage Indication is 112 Volts
- T11B Voltage Indication is 114 Volts
- T11C Voltage Indication is 113 Volts
- T11D Voltage Indication is 114 Volts

Which ONE of the following describes the FINAL plant response if voltage remains at these values for an extended period?

A. All safeguards busses will be energized by their respective EDG.

B. T11A and T11C busses will be energized by their respective EDG.

C. T11A and T11B busses will be energized by its respective EDG.

D. Only T11A bus will be energized by its respective EDG.

ANSWER: %Answer%
An Undervoltage condition of 113 V will energize 62-1 T11A. After a 111 Second delay it will open T11A9 and T11B1 causing T11 A and T11B to lose power. This will cause the EDG to start and energize T11A and T11B.

A - Incorrect - T11 C and T11D will NOT deenergize since T11D is > 113V
B - Incorrect - T11C will NOT deenergize since T11D is > 113V
D - Incorrect - T11B will also recieve a trip signal and be energized by the EDG.
Lesson Plan/Objective:RO-C-08201/#6

Reference:RO-C-08201, Engineered Safety Systems Electrical pg. 29, 30, and Att.3
Annunciator #121 Response, Drop 78 Train B Aux Buses Undervoltage pg. 156-163

A.C. Electrical Distribution System
Knowledge of the physical connections and/or cause-effect relationships between the A.C. Distribution System and the following systems:
ED/G
RO-4.1 SRO-4.4

52. 052 4
Answer: D
<u>The following conditions exist on Unit 1</u>:
- The reactor was operating at 92% power.
- All controls are in automatic normal lineup.
- An automatic reactor trip occurred fifteen (15) minutes ago.

After the trip, operators note RCP bus 1B is NOT energized and the reserve feed breaker (1B5) over current trip annunciator is lit. The reactor operator has been directed to clear the seal in on the alarm and attempt to re-close the breaker (1B5).

Which ONE of the following describes the response of the breaker 1B5 once the alarm is cleared? (OP-1-980411-4, 4KV Aux Transformers 1AB & 101AB Sht. 2 Elementary Diagram attached)

A. Closes automatically.

B. Can be closed by the operator using only the breaker control switch.

C. Cannot be closed until an AEO clears the over current conditions locally.

D. Cannot be closed with the control switch until an operator clears the anti-pump circuit.

ANSWER: %Answer%
Clearing the Alarm will clear the trip signal but the anti-pump circuit will keep the breaker locked out until it is reset. The breaker cannot be closed until the auto close signal is removed. The device that caused the auto close signal must be reset. Turning the associated breaker DC control power off will also reset the circuit.

A - Incorrect - The anti-pump circuit will keep the breaker from closing.
B - Incorrect - The anti-pump circuit will keep the breaker from closing.
C - Incorrect - The Overcurrent will clear once the breaker trips open. Resetting the alarm would allow reclosure except the anti-pump circuit will keep the breaker from closing.

Lesson Plan/Objective:RO-C-08200/#6

Reference:OP-1-980411-4, 4KV Aux Transformers 1AB & 101AB Sht. 2 Elementary Diagram

SD-08200, Balance of Plant Electrical System Description pg.52, 53, and Figure 18

A.C. Electrical Distribution System
Knowledge of A.C. Distribution System design feature(s) and/or interlock(s) which provide for the following:
Interlocks between automatic bus transfer and breakers
RO-2.8 SRO-3.1

Provide Attachment - OP-1-980411-4, 4KV Aux Transformers 1AB & 101AB Sht. 2 Elementary Diagram

53. 053 5
Answer: D
The in-service "N" Train Battery Charger has been disconnected from the 600v AC power supply by a load shed.

Which ONE of the following describes the system or operator response necessary to restore the battery charger to service?

A. The standby charger will automatically pick up the load and battery.

B. The charger will come back on when sufficient draw down of the battery has occurred.

C. This charger is locked out and cannot be re-energized. Therefore, it is necessary to put the opposite train charger in service by placing its control box switch to Auto.

D. Turn the battery charger control box switch on the in-service battery charger to Off and then back to Auto.

ANSWER: %Answer%
After a Safety Injection or Load Shed, the In-Service battery charger must be manually reset by placing the chargers control switch to OFF and then returning it to AUTO.

A - Incorrect - The standby charger will NOT automatically pick up load.
B - Incorrect - The charger will NOT come back on until it is reset.
C - Incorrect - The charger may be reset. The opposite charger will NOT energize the battery by placing the switch to AUTO.
Lesson Plan/Objective: EOP Task 0820080504 - UO-C-AS11/#3.5

Reference:01-OHP-4024-115 Annunciator #115 Response Drop 57 Trains A & B N Battery Chg De-energized pg. 91and 92
01-OHP-4021-082-015 Operation of the N Train Battery System pg. 2-4 and 10
OP-1-98210-13

D.C. Electrical Distribution System
Knowledge of the physical connections and/or cause-effect relationships between the D.C. Electrical System and the following systems:
Battery charger and battery
RO-2.9 SRO-3.5

54. 054 3
Answer: C
The 2AB Emergency Diesel Generator (EDG) has been manually started and paralleled to the grid, in accordance with 02-OHP-4030-STP-027AB, AB Diesel Generator Operability Test (Train B). The operator loaded the EDG to 1000 KW with minimum amps indicated on all three phases.

Before the EDG has operated for 10 Minutes at 1000 KW the operator observes that the amp readings on all three phases have increased to 610 amps.

Which ONE of the following statements describes the action required to correct this condition and the basis for this action?

A. Trip the EDG to prevent exceeding the maximum voltage ratings of the supplied loads.

B. Remove loads from the associated bus by swapping required pumps to the other train to prevent exceeding the Generator current rating.

C. Manually adjust the voltage regulator to reduce current to prevent overheating of the Generator.

D. Raise EDG speed to reduce the reactive load and prevent motoring the Generator.

ANSWER: %Answer%
The rising current was a caused by a failure of the voltage regulator. Transferring the Voltage regulator to manual and reducing current will prevent excessive reactive loads and reduce heating.

A - Incorrect - Voltage is locked in by the Grid when the EDG is paralleled.
B - Incorrect - With the EDG paralleled to the grid stopping pumps on the bus will not reduce EDG current.
D - Incorrect - EDG speed is high enough to prevent motoring.
Lesson Plan/Objective:RO-C-03200/#12

Reference:SD-03200, Emergency Diesel Generators pg. 32, 55-59
02-OHP-4030-STP-027AB, AB Diesel Generator Operability Test (Train B) pg. 40 Step 3.17, and 51-52

Emergency Diesel Generator (ED/G) System
Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Consequences of high VARS on ED/G integrity
RO-2.5 SRO-2.7

55. 055 6
Answer: C
Which ONE of the following lists the two conditions that will independently cause automatic closure of Liquid Waste Disposal Effluent Discharge Header Shutoff Valve, 12-RRV-285?

A. Low circulating water flow
High radiation sensed in the release header

B. Low circulating water flow
High radiation sensed in the circulating water flow

C. Low release header radiation monitor sample flow
High radiation sensed in the release header

D. High release header radiation monitor sample flow
High radiation sensed in the circulating water flow

ANSWER: %Answer%
High radiation sensed on RRS-1000 or Low Sample flow on RFS-1010 will cause an isolation of 12-RRV-285.

A - Incorrect - Low circulating water flow will close 1-RRV-287 or 2-RRV-286 NOT 12-RRV-285.
B - Incorrect - Low circulating water flow will close 1-RRV-287 or 2-RRV-286 NOT 12-RRV-285. Also CW radiation will not close 12-RRV-285.
D - Incorrect -CW radiation will not close 12-RRV-285.

Lesson Plan/Objective: RO-C-02200/#8

Reference: OP-12-98810-9 Liquid Waste Effluent Radiation Monitoring Sampler Sys (RRS-1000) Elementary Diagram.
OP-12-98313-14 Rad Waste Disposal Sys Liquid Waste Elementary Diagram.

56. 056 7
Answer: C
Which ONE of the following will cause the waste gas compressor discharge to be directed to the standby gas decay tank?

A. High hydrogen alarm on the Automatic Gas Analyzer for the gas decay tank being filled.

B. Low pressure in the standby gas decay tank.

C. Extreme high oxygen alarm on the Alternate Oxygen Monitor.

D. High pressure in the waste gas vent header.

ANSWER: %Answer%
Extreme high O2 as sensed on the Alternate Oxygen Monitor will cause the in-service tank to isolate and the standby tank to align.

A. Incorrect - There is NO high hydrogen automatic alignment from the automatic gas analyzer.
B - Incorrect - Pressure >100 psig in the in-service tank will cause the swap
D - Incorrect - This is high pressure prior to the waste gas compressor.
Lesson Plan/Objective: RO-C-02300/#8

Reference:01-OHP-4024-128 Annunciator #128 response Drop 15 Waste Gas Analyzer O2 Ext High pg. 30-31
01-OHP-4024-128 Annunciator #128 response Drop 20 Gas Decay Tanks Switching pg. 40-41

Waste Gas Disposal System (WGDS)
Knowledge of Waste Gas Disposal System design feature(s) and or interlock(s) which provide for the following:
Isolation of waste gas release tanks
RO-2.9 SRO-3.4

57. 057 3
Answer: A
Which ONE of the following will result in the generation of a Containment Ventilation Isolation (CVI) signal on a HIGH Alarm?

A. Upper containment area radiation monitors, VRS-1101/1201

B. Unit vent effluent high range noble gas radiation monitor, VRS-1509

C. Lower Containment high range area monitors, VRA-1310/1410

D. Unit vent effluent low range noble gas radiation monitor, VRS-1505

ANSWER: %Answer% - Upper containment area monitors, VRS1101/1201, cause a Containment Ventilation Isolation.

B - Incorrect - VRS-1509 is AB Vent monitor which opens 1-VRV-317 and closes 1-VRV-318.
C - Incorrect - VRA1310/1410 are indication/alarm only. Other channels of the 1300/1400 monitors actuate Containment Ventilation Isolation on Lower Containment Radiation.
D - Incorrect - VRS-1505 isolates 12-RRV-306 waste gas release.

Lesson Plan/Objective: RO-C-01350 / #3

Reference: 12-OHP-4021-013-006, Operation of the Eberline Radiation Monitoring System Control Terminal pg. 1-7
RO-C-01350, Radiation Monitor System pg. 48-49

Area Radiation Monitoring (ARM) System
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ARM system controls including:
Radiation levels
RO-3.4 SRO-3.6

58. 058 1
Answer: B
In preparation for a Unit 1 Containment Pressure Relief, the BOP operator is directed to initiate a Source Check for Channel ERS-1305.

Fifteen seconds later the Unit Supervisor notes that the indication for Monitor ERS-1300 on the Unit 1 Composite display has turned WHITE.

Which ONE of the following explains the reason for this indication (WHITE status)?
(Assume all other channels/monitors are functioning properly)

A. Source Check has been successfully completed.

B. Source check has been initiated and is still in progress.

C. The ALERT setpoint has been exceeded for the monitor during the source check.

D. The monitor Trip/Block switches are still in the BLOCK position.

ANSWER: %Answer%
Any CHANNEL in Check Source will cause the MONITOR to display as white on the composite screen. ERS-1305 is a CHANNEL of the ERS-1300 MONITOR.

A - Incorrect - The channel will return to Green when the Check Source has successfully completed.
C - Incorrect - Channel will alarm in Yellow if the alert setpoint is reached.
D - Incorrect - The Trip/Block switches are external to the Radiation Monitor Display system and do NOT affect the monitor color.
Lesson Plan/Objective:RO-C-1350/#8

Reference:12-OHP-4021-013-006, Operation of the Eberline Radiation Monitoring System Control Terminal pg. 8-11
RO-C-01350, Radiation Monitor System pg. 28

Process Radiation Monitoring (PRM) System
Ability to manually operate and/or monitor in the control room:
Radiation monitoring system control panel
RO-3.7 SRO-3.7

59. 059 4
Answer: C
Unit 2 was operating at 100% power when the reactor was manually tripped due to lowering RCS Pressure and Pressurizer level. All systems responded as designed.

The following plant conditions exist:
SRA-2905, Steam Jet Air Ejector, has a HIGH alarm.

Which ONE of the following would be used to identify WHICH SG has a tube leak under these conditions?
A. SG feed flow to steam flow mismatch.

B. MRA-2601, 2602, 2701, and 2702, SG PORV Radiation Monitors.

C. R-19, Blowdown Sampling Radiation Monitor during Chemistry sampling.

D. R-24, SG Blowdown Treatment Radiation Monitor during Chemistry sampling.

ANSWER: %Answer%
Typically, blowdown sample monitor monitors all SGs combined. Individual SGs will be selected by Chemistry following the trip to aid in identifying the ruptured SG.

A - Incorrect - NOT a sensitive method of comparison as it requires large gpm leak rates before this is Noticeable. Following the trip this would be an ineffective method.
B - Incorrect - Since Offsite power is NOT lost the SG PORVs will remain closed. (Monitors do NOT reflect SG activity if PORVs are closed)
D - Incorrect - Treatment monitor will NOT respond to individual SGs during sampling activity. (Isolated upon trip)
Lesson Plan/Objective:RO-C-EOP-08/#5

Reference: RO-C-EOP08, SGTRs, E-3 Series EOPs, and Background Information pg. 16 & 21

Process Radiation Monitoring (PRM) System
Knowledge of the physical connections and/or cause-effect relationships between the PRM System and the following systems:
Those systems served by PRMs
RO-3.6 SRO-3.9

60. 060 2
Answer: B
Unit 1 was operating at 100% power when an Inadvertent Phase A Containment Isolation occurred. The Crew has reset Phase A Containment Isolation and attempted to restore Control Air to Containment. The Control Air Containment Isolation Valves failed to open.

Which ONE of the following describes short-term impact of the loss of air on the restoration efforts of the crew?
A. RCP NESW Motor Air cooling water can NOT be restored.

B. Glycol Cooling to the ICE condenser can NOT be restored.

C. RCS overpressure protection has been lost (PORVs won't open).

D. RCP Seal Injection is available but Seal Return can NOT be restored.

ANSWER: %Answer%
Glycol Cooling inside Containment Isolation valves VCR-11 and VCR-21 will NOT open.

A - Incorrect - NESW to RCP Motor Cooling valves are located outside containment and close on a Phase B Isolation.
C - Incorrect - PORVs NRV-152 and NRV-153 have local reservoirs.
D - Incorrect - RCP Seal Injection is not isolated and Seal Return QCM-250 and QCM-350 are motor operated valves. RCP Seal Leakoff valves QRV-10, 20, 30, and 40 are fail open.

Lesson Plan/Objective:RO-C-AOP-8/AOP8.13

Reference:RO-C-01000 Ice Condenser system pg. 32 and TP-13

Instrument Air System (IAS)
Knowledge of the effect that a loss or malfunction of the IAS will have on the following:
Containment air system
RO-3.1 SRO-3.4

61. 061 3
Answer: B
Due to a failure of the fire protection system, a fire in the Unit #1 Control Room Cable Vault has resulted in loss of equipment control and normal habitability.

<u>The following plant conditions exist:</u>
- As you are leaving the Control Room, you notice indications of load shed occurring and both EDGs start and load.
- Control is established for all systems except the centrifugal charging pumps (CCPs)

Which ONE of the following procedural actions is required to initially establish CVCS flow to the RCS?

A. Restore the 1E CCP using the restoration series procedures.

B. Cross-tie from the U-2 CVCS system to allow RCP seal injection to maintain level.

C. Cross-tie from the U-2 CVCS system to allow BIT flow to maintain level.

D. Align the 1E CCP using the Unit 1 LS-5 (Local Shutdown) series procedures.

ANSWER: %Answer%
The operators are directed to establish seal injection within 30 minutes using the crosstie to Unit 2 as per 01-OHP-4025-LS-6-1, Seal Injection from CVCS Crosstie.

A - Incorrect - The restoration series procedures are used after the Unit has been stabilized. The 01-OHP-4045-R.6 procedures assume that seal injection is already being supplied from the opposite unit or from the other charging pump.
C - Incorrect - Seal injection flow is first established to the RCPs. The procedures direct ~8gpm flow to prevent overfilling the Pressurizer. This equates to the minimum 2 gpm required per seal.
D - Incorrect - The LS-5 series procedures assumes that a Unit 1 charging pump is operating. It aligns various flowpaths from the Unit 1 charging pump to the RCS but does NOT Start a Unit 1 Charging pump.

Lesson Plan/Objective:

Reference:01-OHP-4025-001-001, Emergency Remote Shutdown pg.11
01-OHP-4025-LS-6, RCS Make-up, Seal Injection, and Boration with CVCS Crosstie pg. 1

Fire Protection System (FPS)
Knowledge of the effect that a loss or malfunction of the Fire Protection System will have on the following:
Shutdown capability with redundant equipment
RO-2.7 SRO-3.2

62. 062 3
Answer: C
Unit 2 is operating at 100% power. A small instrument air leak inside Containment causes a slow rise in Containment pressure. Containment pressure is currently 0.29 psig.

In order to ensure that adequate margin to Containment Technical Specification pressure limits is maintained, which ONE of the following indicates the appropriate action to reduce Containment pressure ?

A. Maximize NESW cooling to the Containment Ventilation Units

B. The Containment should be vented using the Containment Purge System.

C. The Containment should be vented using the Containment Pressure Relief system.

D. All Upper/Lower Containment Ventilation Fans (CUV/CLV) should be started or verified running.

ANSWER: %Answer%
With the Containment Pressure rising due to air line leakage, the only way to reduce pressure is to purge air from Containment. This is accomplished with the Containment Pressure Relief System. The Containment Purge system requires multiple reviews and sampling prior to use and is used only for shutdown conditions.

A - Incorrect - Increasing cooling (lowering temperature) may cause a slight pressure reduction but with continued in-leakage pressure a release will have to be performed.
B - Incorrect - The Containment Purge system requires multiple reviews and sampling prior to use and is used only for shutdown conditions.
D - Incorrect - Increasing cooling (lowering temperature) may cause a slight pressure reduction but with continued in-leakage pressure a release will have to be performed.
Lesson Plan/Objective:RO-C-02800/#2

Reference:RO-C-02800, Containment Ventilation System pg. 7

Containment System
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Containment System controls including:
Containment pressure, temperature, and humidity
RO-3.7 SRO-4.1

63. 063 1
Answer: B
While performing actions in 02-OHP-4023-E-3, 'Steam Generator Tube Rupture' the Control Room Supervisor has reached Step 8 which reads:

8.# Check Intact SG Levels:
a. Narrow Range level - Greater than 13%

Which ONE of the following BOP responses would satisfy Cook Plant Management expectations for Verbal Communications?

A. Yes, intact Sierra Golf narrow range levels are 40% and rising.

B. Yes, intact Steam Generator narrow range levels are 50% and stable.

C. Yes, intact Steam Generator narrow range levels are greater than 13%.

D. Yes, intact Steam Generator narrow range levels are 15% and increasing.

ANSWER: %Answer%
Correct response is to provide the component name (Steam Generator), a current value (50%) and trend (stable)

A - Incorrect - The phonetic "Sierra Golf" is not appropriate for Steam Generator.
C - Incorrect - A value/trend should be provided.
D - Incorrect - "increasing" is a sound alike word to decreasing and is Not allowed.
Lesson Plan/Objective:RO-C-ADM14/ADM 14-6

Reference:PMP-4010-COM-001 Verbal Communications pg. 3-4
OHI-4023 Abnormal/Emergency Procedure User's Guide pg. 24
Generic
Conduct of Operations
Ability to make accurate, clear and concise verbal reports.
RO-3.5 SRO-3.6

64. 064 5
Answer: A
A maintenance visual inspection requires momentarily placing the 'B' train pump control switch in PULL-TO-LOCKOUT. The Unit condition is such that BOTH trains are required to auto start.

Which ONE of the following describes the status of the affected ESF system?

The 'B' train pump is INOPERABLE until...

A. the control switch is independently verified in its normal position.

B. the pump's monthly surveillance has been performed.

C. the pump's auto start function is tested.

D. the pump is manually started.

ANSWER: %Answer%
The B train pump may be considered Operable after being returned to the correct position and being independently verified.

B - Incorrect - Surveillance does NOT need to be performed to declare B train equipment operable.
C - Incorrect - Once returned to the correct position and being independently verified train B is considered operable - a test of the pump's auto start function is NOT required.
D - Incorrect - Once returned to the correct position and being independently verified train B is considered operable - a functional test (manual start) is NOT required.
Lesson Plan/Objective:RO-C-ADM1/#4

Reference:OHI-4043 Technical specification Open Items Log pg. 5

Generic
Equipment Control
Ability to analyze the affect of maintenance activities on LCO status.
RO-2.6 SRO-3.8

65. 065 5
Answer: A
Which ONE of the following evolutions would meet the 02-OHP-4030-227-037, Refueling Surveillance definition of "entering MODE 6"?

A. Movement of the first assembly into containment during core reload.

B. Movement of the first assembly out of containment during core offload.

C. Latching of the first fuel assembly in the Spent Fuel Pit during core reload.

D. As soon as RCS temperature is lowered to less than 140^{o}F with a boron concentration of at least 2450 ppm.

ANSWER: %Answer%
Movement of the first assembly into containment following a complete offload(defueled) condition is considered "entry into Mode 6".

B - Incorrect - Mode 6 is entered upon detensioning the reactor vessel head.
C - Incorrect - Mode 6 is entered when the assembly enters containment.
D - Incorrect - Mode 6 is entered when the assembly enters containment.
Lesson Plan/Objective:RO-C-ADM13/ADM13.1.0

Reference:02-OHP-4030-227-037, Refueling Surveillance pg. 5

Generic
Equipment Control
Knowledge of the refueling process.
RO-2.6 SRO-3.5

66. 066 5
Answer: C
Unit 1 has experienced a Large Break LOCA. All safeguards equipment functioned properly following the event initiation. You are the BOP assigned to perform 01-OHP-4023-E-0, Reactor Trip or Safety Injection Attachment A.

Which ONE of the following describes the action required for the Control Room Pressurization fans and why?

A. Manually start both pressurization fans to ensure that enough pressure exists to ensure adequate filter flow.

B. Verify that both pressurization fans automatically start to ensure that enough pressure exists to ensure adequate filter flow.

C. Manually stop one pressurization fan to ensure that control room dose remains within analyzed limits.

D. Notify Unit 2 control room to start both pressurization fans if one Unit 1 fan is NOT running to ensure that control room dose remains within analyzed limits.

ANSWER: %Answer%
Attachment A Step 4 provides direction to stop 1 pressurization fan to limit the filter flow rates to ensure the dose remains within limits.

A - Incorrect - Both fans are expected to auto start and one fan must be stopped.
B - Incorrect - One fan must be stopped to limit the filter flow rate.
D - Incorrect - One pressurization fan for each Unit through its respective (independent) filter train is required.
Lesson Plan/Objective:RO-C-EOP03/#22

Reference:01-OHP-4023-E-0, Reactor Trip or Safety Injection Attachment A pg. 35
PSBD 12-OHP-4023-E-0 background document pg. 75

Generic
Radiological Controls
Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.
RO-2.9 SRO-3.3

67. 067 1
Answer: C
If the Reactor Coolant Subcooling Margin Monitor is not working properly, which ONE of the following describes the instrumentation used to calculate subcooling per 02-OHP-4023-SUP.001, Subcooling Margin Determination?

A. Use 8 highest CETC average and lowest RCS wide range pressure

B. Use 8 highest CETC average and lowest RVLIS pressure.

C. Use 5 highest CETC average and lowest RVLIS pressure.

D. Use 5 highest CETC average and lowest RCS wide range pressure.

ANSWER: %Answer%
02-OHP-4023-SUP.001, Subcooling Margin Determination requires the use of the lowest RVLIS pressure instrument and the 5 highest CETCs.

A - Incorrect - Meter uses average of 8 CETCs, but procedure uses 5. Also RCS wide range is NOT used.
B - Incorrect - Meter uses average of 8 CETCs, but procedure uses 5.
D - Incorrect - RCS wide range is NOT used.

Lesson Plan/Objective:RO-C-00200/#9

Reference:02-OHP-4023-SUP.001, Subcooling Margin Determination pg. 2-3

Generic
Emergency Procedures/Plan
Ability to identify post-accident instrumentation.
RO-3.5 SRO-3.8

68. 068 3
Answer: B
Unit 2 has experienced a large break LOCA with complications. The crew is performing the steps of 02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation, when the STA announces that two of the critical safety functions are indicating an ORANGE path.

<u>The ORANGE path identified procedures are:</u>
- 02-OHP-4023-FR-C.2, Response to Degraded Core Cooling
- 02-OHP-4023-FR-Z.1, Response to High Containment Pressure

Which ONE of the following describes the required action and reason based on these conditions?

A. Immediately implement 02-OHP-4023-FR-Z.1 since the containment is the last remaining fission product barrier.

B. Immediately implement 02-OHP-4023-FR-C.2 since protection of the cladding is the highest priority.

C. Continue with 02-OHP-4023-ECA-1.1 since the Loss of Recirculation capability must be resolved before Function Restoration Procedures are implemented.

D. Continue with 02-OHP-4023-ECA-1.1 while also performing the steps of 02-OHP-4023-FR-Z.1 since protection of containment is critical.

ANSWER: %Answer%
Procedural usage requires performance of the highest priority RED or ORANGE path procedure. This would require implementing 02-OHP-4023-FR-C-2 since restoration of heat removal is vital to prevent failure of the fuel matrix/cladding.

A - Incorrect - Containment is the 3rd barrier. On a LOCA the RCS pressure boundary is lost but the cladding remains. Protection of cladding is a higher priority.
C - Incorrect - ORANGE path represent a severe challenge and must be implemented immediately even during ECA-1.1.
D - Incorrect - A transition must be made to the FR and the required FR is 02--OHP-4023-FR-C-2
Lesson Plan/Objective:RO-C-EOP01/#22

Reference:RO-C-EOP01, Introduction to EOPs and Rules of Usage pg. 20-24

Generic
Emergency Procedures/Plan
Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.
RO-2.8 SRO-3.8

69. 069 5
Answer: D
Unit 2 has experienced a loss of both CCW pumps in MODE 3.

The following plant conditions exist:

- NEITHER Unit 2 CCW pump can be restarted.
- CVCS crosstie from Unit 1 is NOT available.
- BOTH Unit 2 CCPs are running because a CCP swap was in progress.
- 02-OHP-4022-016-004, Loss of Component Cooling Water, is in progress.

Which ONE of the following describes the procedural requirements for CCP operation based on these conditions?

A. Immediately stop both CCPs.

B. Immediately stop one CCP; stop the second CCP within 1-1/2 minutes of the event.

C. Stop BOTH CCPs within 1-1/2 minutes of the event.

D. Immediately stop one CCP; run the second CCP as long as it continues to operate.

ANSWER: %Answer%
02-OHP-4022-016-004 has a note prior to step 4 that describes the possible damage that may occur to a CCP on the loss of CCW. The note and procedure directs that one CCP be saved until CCW is restored. The other pump should be run as long as possible to allow time to align Seal injection crosstie.

A - Incorrect - One pump should be run as long as possible to allow time to align Seal injection crosstie.
B - Incorrect - One pump should be run as long as possible to allow time to align Seal injection crosstie. (The pump may trip after 1.5 minutes)
C - Incorrect - One pump should be run as long as possible to allow time to align Seal injection crosstie. (The pump may trip after 1.5 minutes)
Lesson Plan/Objective:RO-C-AOP-5/AOP5.13

Reference:02-OHP-4022-016-004, Loss of Component Cooling Water pg. 4-5

Generic
Emergency Procedures/Plan
Knowledge of loss of cooling water procedures.
RO-3.3 SRO-3.7

70. 101 2
Answer: D
Unit 2 was operating at 100% power when rod H4 dropped into the core. 02-OHP-4022-012-005 requires power to be reduced to less than 75% power.

Which ONE of the following describes the basis for this requirement?

Power must be reduced ...
A. to ensure that adequate shutdown margin exists.

B. to ensure that a radial flux oscillation does NOT develop.

C. so that upon rod recovery axial flux difference is not exceeded.

D. so that fuel rod peaking factors are NOT exceeded during continued operations.

ANSWER: %Answer%
A dropped control rod leads to a flux depression and peaking other than originally designed. The power reduction helps to ensure that fuel rod integrity is maintained during power operations.

A - Incorrect - The ability to trip a rod impacts shutdown margin.
B - Incorrect - Accident analysis must be reevaluated to confirm that results remain valid. The power reduction does NOT accomplish this.
C - This is NOT the reason for the required reduction to <75% power. If the rod is to recovered after an extended period power may need to be reduced even further to prevent a power shift when the rod is withdrawn.
Lesson Plan/Objective:RO-C-AOP-6/AOP6.21

Reference:RO-C-AOP-6, Abnormal Operating Procedures - Day 6 pg. 62-63
Technical Specification 3.1.3.1 Movable Control Assemblies - Group Height pg. 3/4 1-18 & 1-19 and Bases pg. B 3/4 1-4

Dropped Control Rod
Equipment Control
Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.
RO-2.5 SRO-3.7

71. 102 2
Answer: C
A Unit 2 power ascension was in progress following a maintenance outage. While raising power from 90% to 100% power, several alarms were received.

The following plant conditions exist:
Annunciator Panel 210:
Drop 18 Power Range Flux Deviation - LIT
Drop 21 Nuclear Instn System Tilt Cmptr Alarm - LIT
Drop 29 Rod Sequence Violation - LIT
IRPI for Control Bank D rod D4 - 0 steps
IPRI for rest of Control Bank D - 225 Steps
Bank Demand for Control Bank D - 225 steps

□□Flux 2-NRI	10	12	14	16
Indication	3.1	3.1	1.2	3.2

Given the attached section of 02-OHP-4022-012-005 Dropped or Misaligned Rod which ONE of the following is the required action?

A. Declare Rod Position Indication for Rod D4 Inoperable and perform flux map as required per Technical Specification 3.1.3.2
B. Declare Rod Position Indication for Rod D4 Inoperable and initiate PMP-4030-EIS-001 Event -Initiated Surveillance Testing.
C. Declare Rod D4 Inoperable and initiate a Plant Shutdown per 02-OHP-4021-001-003.
D. Declare Rod D4 Inoperable and initiate a power reduction. Stabilize the plant at <75% power to begin repairs and recovery.

ANSWER: %Answer%
The indications show that rod D 4 has dropped and become misaligned. □□Flux 2-NRI-14 and the flux deviation alarm indicate that it is an actual misalignment and NOT a RPI failure. The procedure directs that Rod D4 be declared Inoperable and a Plant Shutdown initiated per 02-OHP-4022-012-005 since it has been stable for less than 48 Hours.

A - Incorrect - □□Flux 2-NRI-14 and the flux deviation alarm indicate that it is an actual misalignment and NOT a RPI failure.
B - Incorrect - □□Flux 2-NRI-14 and the flux deviation alarm indicate that it is an actual misalignment and NOT a RPI failure.
D - Incorrect - The procedure directs that Rod D4 be declared Inoperable and a Plant Shutdown initiated per 02-OHP-4022-012-005 since it has been stable for less than 48 Hours.

Lesson Plan/Objective:RO-C-AOP-6/AOP6.20

Reference:02-OHP-4022-012-005 Dropped or Misaligned Rod pg. 4 & 8

Dropped Control Rod
Ability to determine and interpret the following as they apply to the Dropped Control Rod: Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements RO-3.6 SRO-3.8
Provide Attachment - 02-OHP-4021-012-005 pages 3-10 and 2-Figure 13.1

72. 103 4
Answer: B
Pressurizer Pressure Channel #1 has failed and has been placed in the tripped condition. Reactor trip breaker testing was taking place at 75% power. Pressurizer Pressure Channel #2 has spiked low causing an inadvertent Safety Injection Actuation and a reactor trip on Unit 1. Pressurizer Pressure Channel #2 has returned to a normal reading.

<u>The following conditions exist:</u>

- Reactor trip breaker A - OPEN
- Reactor trip bypass breaker A - OPEN
- Reactor trip breaker B - OPEN
- Reactor trip bypass breaker B - CLOSED

Which ONE of the following describes the impact (if any) this condition will have on restoring the plant to stable conditions?

A. The Train B Safety Injection signal will NOT be able to be reset. Train B equipment will have to be placed in Pull-to-Lockout to stop it.

B. The Train B Safety Injection signal will reset but Auto Safety Injection Actuation will NOT be blocked.

C. The Safety Injection signal will NOT be able to be reset on either train. Safeguards equipment will have to be placed in Pull-to-Lockout to stop it.

D. The Safety Injection signal will reset on both trains. Auto Safety Injection Actuation will be blocked.

ANSWER: %Answer%
The SI reset and P-4 block features are train specific. With a failure of Train B reactor Trip Bypass Breaker to open a P-4 signal is not generated on Train B. Since the cause of the SI was a pressure channel spike the SI signal is NOT preventing Train B from being reset. The SI will reset but the Auto SI blocking function of P-4 will NOT function on Train B.

A - Incorrect - The Safety Injection signal will reset.
C - Incorrect - The Safety Injection signal will reset. The SI reset and P-4 block features are train specific.
D - Incorrect - The SI reset and P-4 block features are train specific so Train B auto SI will NOT be blocked.
Lesson Plan/Objective:RO-C-01100 / #6

Reference:OP-2-98512-21 Safeguard actuation & Reactor Trip Signals Logic Diagram

Reactor Trip
Ability to determine and interpret the following as they apply to a reactor trip:
Reactor trip breaker position
RO-4.2 SRO-4.4

73. 104 3
Answer: B
Unit 2 is responding to a Small Break LOCA in 02-OHP-4023-ES-1-2, Post LOCA Cooldown and Depressurization.

Step 13 of 02-OHP-4023-ES-1-2 requires the operators to depressurize the RCS.

Which ONE of the following statements describes correct order of preference and the reasons for using the prescribed methods of depressurizing the RCS system?

A. 1. Normal spray - preferred method to be used if RCS pump is running
 2. Auxiliary Spray - alternate method - better control over depressurization rate
 3. PORV - method of last resort - lack of control of depressurization rate - results in rupturing the PRT

B. 1. Normal spray - preferred method to be used if RCS pump is running
 2. PORV - alternate method - better than auxiliary spray
 3. Auxiliary Spray - method of last resort - may thermal shock the spray nozzles

C. 1. PORV - preferred method - rapid depressurization rate
 2. Normal spray - alternative method - next most rapid depressurization rate
 3. Auxiliary spray - method of last resort - may thermal shock the spray nozzles

D. 1. Auxiliary spray - preferred method - does NOT degrade containment
 2. Normal spray - alternative method - will NOT work if RCP is NOT running
 3. PORV - method of last resort - will rupture PRT and degrade containment environment

ANSWER: %Answer% -
Normal Pressurizer spray provides the most controlled depressurization. The PORVs provide the preferred alternate method based on both timeliness and minimal complications.

A - Incorrect - PORV is the alternative method - aux spray is the last resort
C - Incorrect - Pressurizer spray preferred over PORV.
D - Incorrect - Auxiliary spray is the last resort.

Lesson Plan/Objective:RO-C-EOP09/#36

Reference:PSBD Rev. 3 12-OHP-4023-ES-1.2 Background document Step 13 Basis pg. 35-37

Small Break LOCA
Conduct of Operations
Ability to execute procedure steps.
RO-4.3 SRO-4.2

74. 105 1
Answer: D
The Unit 2 Reactor Operator has just informed you that while performing 02-OHP-4030-203-052L, Controlled Leakage Verification Test the seal line resistance was determined to be 2.13E-1 ft/gpm^2.
Technical Specification requires a value of greater than or equal to 2.27E-1 ft/gpm^2.

Which ONE of the following describes the impact this seal line resistance would have on the RCS should a small break LOCA occur? (based on accident analysis assumptions)

A. Auxiliary Spray flow may be less than required for RCS depressurization.

B. Seal Injection flow may be insufficient to the cool the seals in the event of a Thermal barrier rupture.

C. Charging Pump minimum flow may be less than required for pump cooling.

D. Boron Injection Tank flow may be less than required for core cooling.

ANSWER: %Answer%
The limitation on seal line resistance is to ensure that the minimum safeguards flow to the RCS will be sufficient for core cooling. The analysis assumes that flow diverted from the BIT line to seal injection is lost to core cooling.

A - Incorrect - Auxiliary Spray flow varies depending on plant conditions. it is not required to be any specific value during accident conditions.
B - Incorrect - In the event of a thermal barrier rupture the RCS will flow into CCW. Seal injection will still be supplied in sufficient quanties. (low seal resistance = higher seal flow)
C - Incorrect - Charging flow minimum flow will come off prior to seal injection. (Pump is only concerned with total flow for cooling)
Lesson Plan/Objective:RO-C-00200/#14

Reference:Technical Specification 3.4.6.2 RCS Operational Leakage pg. 3/4 4-15 to 4-16a and Bases pg. B 3/4 4-3 to 4-4

Small Break LOCA
Knowledge of the reasons for the following responses as they apply to the small break LOCA:
Tech-Spec leakage limits
RO-3.5 SRO-4.3

75. 106 1
Answer: C
Four hours ago, Unit 2 experienced a Large break LOCA. All equipment operated as designed except the West Containment Spray Pump failed to start.

<u>The following plant conditions exist:</u>
- ECCS pumps have been aligned per 02-OHP-4023-ES-1.3,Cold Leg Recirculation.
- West RHR is aligned to Provide RHR Spray.
- RCS Pressure is 95 psig
- RCS temperature is 215^{O}F

The Reactor Operator has just informed you that Containment Pressure has lowered to 1.8 psig.

Which ONE of the following describes the required action(s) concerning Containment Spray operation?

A. CTS Actuation may be reset and Containment Spray (CTS and RHR) may be secured.

B. CTS Actuation may be reset and RHR Spray may be secured. The Containment Spray Pump must continue to operate until the Spray Additive Tank is drained.

C. Containment Spray (CTS and RHR) must continue to operate for 2 more hours.

D. Containment Spray (CTS and RHR) must continue to operate until Containment pressure lowers to less than 1.1 psig.

ANSWER: %Answer%
Containment Spray must operate for at least 6 hours following a large break LOCA. RHR spray is also required if one train of CTS is unavailable.

A - Incorrect - CTS is not reset until it has operated for at least 6 hours and pressure is <2 psig.
B - Incorrect - CTS is not reset until it has operated for at least 6 hours and pressure is <2 psig. RHR spray is also required to operate. The Spray additive tank should already be drained.(4000 gal/18.5gpm)
D - Incorrect - CTS may be reset and secured when pressure lowers to <2 psig

Lesson Plan/Objective:RO-C-EOP09/#36

Reference: 02-OHP-4023-E-1 Loss of Reactor or Secondary Coolant Step 7 pg. 8-10
PSBD 12-OHP-4023-E-1 Background Document Step 7 Basis pg. 16-18

Large Break LOCA
Ability to determine and interpret the following as they apply to a Large Break LOCA: Conditions necessary for recovery when accident reaches stable phase
RO-3.4 SRO-3.9

76. 107 4
Answer: C
A SGTR has occurred on Unit #2. The crew has entered 02-OHP-4023-E-3, Steam Generator Tube Rupture and identified #22 SG as the ruptured SG. RCS pressure has stabilized at 1800 psig.

Following isolation of #22 SG, the following indications are present:
- All four Blowdown sample lines are isolated, R-19 is still in alarm
- #21, #23, and 24 SG PORVs are maintaining Tave due to a loss of Steam Dumps.
- MRA-2601/2602/2701/2702, SG PORV radiation monitors, are all normal
- Pressurizer Level is 20% and lowering
- AFW flow to #21, #23, and 24 SGs are 90,000 pph to each SG
- RCP Bus 2D has lost power

SG Levels	#21	#22	#23	#24
	7	38	13	6

The STA informs you that he believes a 2nd SGTR is in progress due to the level rise in SG #23.

Do you agree or disagree and why?
A. Agree, RCS pressure and PRZ level indicate multiple ruptures.

B. Agree, because the definition of "Uncontrolled" level rise has been met.

C. Disagree, The SG level rise is caused by the loss of the RCP on the pressurizer loop.

D. Disagree, RCS pressure and PRZ level would have to be much lower if multiple SGs had ruptures.

ANSWER: %Answer%
The SG PORV radiation monitor would be indicating off-normal if the SG #23 had a SGTR. The higher level is the result of reduced steaming because of the loss of the RCP.

A - Incorrect - RCS pressure and PRZ level are as expected for a 400-500 gpm tube rupture.
B - Incorrect - The absence of radiation indication on the SG PORV rad monitor indicates that a tube rupture does not exist.
D - Incorrect - Multiple ruptures could exist with this pressure and level. (200-250 gpm/SG)
Lesson Plan/Objective:RO-C-EOP-08/#5

Reference:RO-C-EOP-08, SGTRs, E-3 Series EOPs, and Background Information pg. 15; RO-C-00201 Reactor Coolant Pump System pg. 18

Steam Generator (S/G) Tube Leak
Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: Agreement/disagreement among redundant radiation monitors
RO-3.4 SRO-3.9

77. 108 2
Answer: B
A reactor trip with a safety injection occurred due to a steam line break. The crew has correctly transitioned from 02-OHP-4023-E-2, Faulted Steam Generator Isolation to 02-OHP-4023-E-1, Loss of Reactor or Secondary Coolant.

You have just reached 02-OHP-4023-E-1, Step 9, Check RCS and SG Pressures

Which ONE of the following statements explains the consequence of moving past step 9 with a depressurizing SG?

A. Continued operation with a faulted steam generator could cause a loss of the AFW pumps due to the loss of makeup water.

B. The crew could be directed to 02-OHP-4023-ES-1.2, Post-LOCA Cooldown & Depressurization and encounter more restrictive SI termination criteria than necessary.

C. The crew could be directed to 02-OHP-4023-ES-1.1, SI Termination and premature SI termination.

D. The crew may be incorrectly directed to 02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation.

ANSWER: %Answer%
This step provides a second check to see if a faulted SG has completed its depressurization. The procedure would then direct the crew back to Step 1, to recheck the initial steps of the procedure and then transition to 02-OHP-4023-ES-1.1, SI Termination. if the operator continues past this step they will be directed to 02-OHP-4023-ES-1.2, Post-LOCA Cooldown & Depressurization and encounter more restrictive SI termination criteria than necessary.

A - Incorrect - AFW flow has already been isolated to the faulted SG. The other SG AFW flow will be throttled.
C - Incorrect - Continuing past step 9 will NOT lead to a transition to 02-OHP-4023-ES-1.1, SI Termination.
D - Incorrect - The crew would NOT reach the point where Emergency Recirculation was required.
Lesson Plan/Objective:RO-C-EOP09/#36

Reference:02-OHP-4023-E-1, Loss of Reactor or Secondary Coolant Step 9 pg. 12
PSBD 12-OHP-4023-E-1, Background Document step 9 Basis pg. 24

Steam Line Rupture
Ability to determine and interpret the following as they apply to the Steam Line Rupture:
When ESFAS systems may be secured
RO-4.1 SRO-4.5

78. 109 2
Answer: B
A reactor trip with a safety injection occurred due to a feed line break on SG#22. The crew is performing actions of 02-OHP-4023-E-0, Reactor Trip or Safety Injection.

Steam Generator Aux Feedwater Flows were indicating as follows:

SG	#21	#22	#23	#24
Flow Instrument	FFI-210	FFI-220	FFI-230	FFI-240
Flow in Lbm/HR	$200x10^3$	Pegged High	$200x10^3$	$200x10^3$

The BOP requests permission to trip the East Motor Driven Aux Feedwater Pump because he has just received Annunciator #213 Drop 19 East MDAFP Discharge Flow High. Which ONE of the following responses are correct given these conditions?

A. NO, Do NOT trip East MDAFP. Close 2-FMO-232 Feed from East MDAFP to reduce total pump flow to acceptable levels.
B. NO, Do NOT trip East MDAFP. Verify that 2-FMO-222 Feed from East MDAFP and 2-FMO-232 Feed from East MDAFP have throttled as expected for Aux Feed Flow Retention.
C. YES, Trip East MDAFP. This alarm indicates that the feed line break is on the Aux Feed Line.
D. YES, Trip East MDAFP. This alarm indicates that Aux Feed Flow Retention has failed.

ANSWER: %Answer%
Upon High AFP flow to a SG (>572 gpm) the flow retention circuit will throttle the AFP valves closed to prevent pump runout. This is an expected alarm given these conditions. The pump should continue to operate after verifying that flow retention is properly operating.

A - Incorrect - This would isolate AFW to the intact SG.
C - Incorrect - This alarm is expected for this condition. The AFP should NOT be stopped.
D - Incorrect - The alarm indicates that flow retention has actuated. The AFP should NOT be stopped.

Note: 501 lbm/hr = 1 gpm
MDAFWP = 450 gpm @ 1175psid (at 1000 psid this is about 490 gpm or $247x10^3$ lbm/hr) TDAFWP = 2x MDAFP (turbine driven feeds all 4 SG while east MDAFP feeds #22 & #23)

Lesson Plan/Objective:RO-C-05600/#12

Reference:02-OHP-4024.213, Annunciator #213 Drop 19 East MDAFP Discharge Flow High pg. 29-30; RO-C-05600, Auxiliary Feedwater System pg. 33

Loss of Main Feedwater (MFW)
Emergency Procedures/Plan
Ability to verify that the alarms are consistent with the plant conditions. RO-3.5 SRO-3.6

79. 110 1
Answer: B
Unit 2 was stable at 100% power with the 2CD Emergency Diesel Generator tagged out for oil pump replacement. A loss of offsite power occurs and the 2AB EDG fails to start. It is estimated that it will take 1 hour to restore power.

Which ONE of the following denotes the required actions (if any) for Unit 2 Control room cooling as per 02-OHP-4023-ECA-0.0, Loss of All AC?

A. Unit 2 Control room cooling is NOT required since power will be restored in 1 hour.

B. Open doors to provide cooling to Vital cabinets within 30 minutes.

C. Crosstie ESW to Unit 1 and align ESW cooling water to the Control Room Air handling unit.

D. Start the Unit 2 North Control Room air handling unit since it is supplied by Unit 1 power.

ANSWER: %Answer%
Unit 2 fans have lost power. The cabinet doors must be opened within 30 minutes to ensure equipment (control and protection cards/circuits) temperatures stay within design limits.

A - Incorrect - Analysis requires cabinet doors opened within 30 minutes.
C - Incorrect - Aligning ESW will provide Backup cooling if the chiller is lost but without the fans this is NOT effective.
D - Incorrect - Unit 2 North is supplied by Unit 2 power.
Lesson Plan/Objective:RO-C-EOP14/#12

Reference:02-OHP-4023-ECA-0.0, Loss of All AC Power Step 8 pg. 11
PSBD 12-OHP-4023-ECA-0.0, Background Document Step 8 pg. 25

Loss of Offsite Power
Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Operational status of ventilation supply fans for the service water building, control room and battery room
RO-2.5 SRO-2.6

80. 111 4
Answer: B
Both Units were operating at 100% power with normal lineups and all equipment operable, when Unit 2 experienced a large break LOCA. The BOP operator has identified that the Unit 2 West ESW pump has tripped and can NOT be restarted.

The following plant conditions exist:
- RCS Pressure - 95 psig
- Containment Pressure - 6 psig
- RWST Level - 36%
- ESW Flow (GPM) to:

ESW Flow (GPM) to:	Train A	Train B
EDG	570	570
CCW HX	5580	5600
CTS HX	0	0

Which ONE of the following describes the actions (if any) that should be taken based on these ESW flows and why?

A. Open the crosstie to Unit 1 West ESW since the flow to the CTS Hxs is inadequate.

B. Verify that both Unit 1 ESW pumps are running and that ESW to CTS Hx valves automatically throttle after aligning for Cold Leg recirculation.

C. Throttle closed on both CCW HXs to reduce flow to 2500 gpm to provide sufficient flow to CTS HXs when they align.

D. Stop the Unit 2 West CCW and CTS pumps and isolate the respective HXs since the flow to the CTS Hxs is inadequate.

ANSWER: %Answer%
Normal alignment for ESW is to operate with the Unit Crossties open. The crossties are cross train (East to West). On a safety injection both Units ESW pumps receive an auto start signal. This should cause 2 Unit 1 ESW pumps to be operating and 1 Unit 2 ESW pump to be running. The flows listed are normal for this condition. The ESW to CTS HX will automatically throttle open when the Recirc Sump is aligned.

A - Incorrect - This crosstie should already be open. CTS flow should NOT be expected in this condition. The Unit 1 West ESW will feed the Unit 2 East Header.
C - Incorrect - Sufficient Flow would be available with 2 unit 1 pumps and 1 unit 2 pump. CCW flow is required to be 5000 gpm.
D - Incorrect - Ther is no reason to stop the West CCW and CTS pumps. CTS flow is expected to be 0 gpm at this time.
Lesson Plan/Objective:RO-C-01900/#11

Reference: RO-C-01900, Essential Service Water System pg. 15-16; SD-01900 Essential Service Water System Description pg. 12, 20, 29, 49, and 57

Loss of Nuclear Service Water
Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The normal values for SWS-header flow rate and the flow rates to the components cooled by the SWS RO-2.4 SRO-2.5

81. 112 4
Answer: C
Given the following:

- A packing leak has been identified on WCR-951, NESW to RCP Air Cooler.
-The WIN team supervisor states that his team can tighten the packing and stop the leak as Minor Maintenance .

Is this activity acceptable for the WIN team to perform <u>and</u> why/why not?

The activity is...
A. acceptable as long as a stroke test is performed post maintenance.

B. acceptable as long as they are accompanied by an AEO to verify the work is performed on the correct equipment.

C. NOT acceptable because Minor Maintenance is not allowed if it requires entry into a Tech Spec LCO action statement.

D. NOT acceptable because this valve can not be closed at power even for a short time.

ANSWER: %Answer% - Minor Maintenance is NOT allowed on equipment that would require or cause entry into a Tech Spec LCO action statement.

A - Incorrect - Tech Spec equipment requires a full job order with a subsequent Post Maintenance test.
B - Incorrect - Tech Spec equipment requires a full job order with a subsequent Post Maintenance test.
D - Incorrect - This valve could be momentarily closed during power operation.

Lesson Plan/Objective: RO-C-ADM03 / #2

Reference: PMP-2291-INT-001, Work Control Activity Initiation Process Attachment 1 Pg. 18-25

Reactor Coolant Pump System (RCPS)
Equipment Control
Knowledge of the process for managing maintenance activities during power operations.
RO-2.3 SRO-3.5

82. 113 3
Answer: D
Given the following data, which ONE of the following describes the status of 1-PP-10E, East Component Cooling Water Pump?

From Technical Data Book Figure 15.1:
□□Flow 7000 gpm — High Action - 94.6 psid
Low Action - 87.3 psid

Pump Test results: Discharge Pressure: 106 psig
Suction Pressure: 22 psig
Discharge Flow: 7003 gpm

A. The East CCW pump is OPERABLE since the discharge pressure is acceptable.

B. The East CCW Pump is OPERABLE but Engineering should be notified since the differential pressure is below the Low Action level.

C. The East CCW Pump is INOPERABLE until the discharge flow is lowered enough to raise the differential pressure to above the Low Action level.

D. The East CCW Pump is INOPERABLE since the differential pressure is below the Low Action level.

ANSWER: %Answer%
The measured Differential pressure is 84 psid. Since the Differential pressure is NOT between the High (94.6) and Low (87.3) Action levels at the required flow the Pump shall be declared INOPERABLE.

A - Incorrect - The psid is below the low action level.
B - Incorrect - The psid is below the low action level.
C - Incorrect - The psid is below the low action level while operating at the required flow.
Lesson Plan/Objective:RO-C-01600/#9

Reference:01-OHP-4030-116-020E, East Component Cooling Water Loop Surveillance pg. 21

Tech Data Book Figure 1-15.1 Safety Related Pump Inservice Test Hydraulic Reference pg. 1-2

Component Cooling Water System (CCWS)
Conduct of Operations
Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.
RO-3.4 SRO-4.0

83. 114 2
Answer: C
At 15:50 Unit 2 experienced a LOCA. After the recirculation sump suction valves were opened in 02-OHP-4023-ES-1.3 "Transfer to Cold Leg Recirculation," neither RHR pump would start. You have proceeded to 02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation and are currently at Step 12, Check if SI can be terminated.

<u>At 17:30 the following conditions exist</u>:
- RCS pressure is 300 psig and slowly lowering.
- NR RVLIS is 76% and slowly lowering.
- WR RVLIS is 23% and slowly lowering
- CETC Average 345^{o}F.
- RWST level is 13% and lowering.
- Containment pressure is 6.5 psig and stable.
- All Centrifugal Charging and Safety Injection pumps are running.
- Both Containment Spray Pumps are currently running with their suction aligned for recirculation.

Which ONE of the following actions is required? {02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation section attached}
A. Do NOT stop or throttle ECCS Pumps, continue attempts to makeup to the RCS.
B. Terminate SI. Stop both SI pumps and 1 CCP. Isolate BIT injection and restore normal charging flowpath.
C. Stop applicable pumps and throttle BIT injection as required to obtain about 310 gpm of injection flow.
D. Stop applicable pumps and throttle BIT injection as required to obtain about 410 gpm of injection flow.

ANSWER: %Answer%
Based on these conditions (NR RVLIS<67%, RCPs tripped on Phase B, with subcooling < 86^{o}F) ECCS flow should be reduced to the minimum required per Figure1 as IAW Step 12.b RNO. The time after trip is 100 minutes which is equal to ~307 gpm.

A - Incorrect - This would be correct if RCPs were running with WR RVLIS <26%. Step 12a RNO to step 18.
B - Incorrect - This would be correct if Subcooling was acceptable. Steps 13-17
D - Incorrect - This flowrate is based on 40 minutes since the trip.
Lesson Plan/Objective:RO-C-EOP09/#45

Reference:02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation pg. 17 and Figure 1 pg. 41

LOCA Outside Containment
Conduct of Operations Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.
RO-2.8 SRO-3.1

Provide Attachment - 02-OHP-4023-ECA-1.1, Loss of Emergency Coolant Recirculation pages 17-21, Foldout Page and Figure 1 (pg.41)

84. 115 5
Answer: B
Unit 2 is performing 02-OHP-4023-FR-C.2 Response to Degraded Core Cooling to address an Orange path condition on Core Cooling.

<u>You have just read the following NOTE prior to step 1:</u>

NOTE
Normal conditions for running RCPs are desired, but RCPs should NOT be tripped if normal conditions can NOT be established or maintained.

Which ONE of the following actions is required based on this caution?

A. RCPs should be restarted even if any had been previously stopped due to loss of support conditions.

B. If RCP's are running, they should be stopped only if directed by 02-OHP-4023-FR-C.2, since RCP trip criteria do NOT apply.

C. If RCP's are running, they should be stopped only if a CCP or SI pump is injecting and RCS pressure is less than 1200 psig.

D. If RCP's are running, they should be stopped only if a Phase B Containment Isolation is received.

ANSWER: %Answer%
This note is provided to remind the operators that RCP trip criteria do NOT apply. If the RCPs are running, they will continue to provide forced single or two-phased flow through the core to keep it cool. Tripping the RCPs may lead to an inadequate core cooling condition. They should NOT be tripped unless directed by this procedure.

A - Incorrect - It is not required to immediately start the RCPs.
C - Incorrect - RCP trip criteria do NOT apply.
D- Incorrect - RCP trip criteria do NOT apply.
Lesson Plan/Objective:RO-C-EOP10/#14

Reference:02-OHP-4023-FR-C.2 Response to Degraded Core Cooling pg. 2
PSBD 12-OHP-4023-FR-C.2 Background Document pg. 5

Degraded Core Cooling
Emergency Procedures/Plan
Knowledge of operational implications of EOP warnings, cautions, and notes.
RO-3.3 SRO-4.0

85. 116 3
Answer: D
Which ONE of the following events addresses all of the required conditions for a potential Pressurized Thermal Shock (PTS) event? {ASSUME: A pre-existing flaw existed.}

A. Cooldown from 580^{O}F to current RCS temperature of 450^{O}F in last 30 minutes, RCS pressure 1700 psig

B. Cooldown from 500^{O}F to current RCS temperature of 350^{O}F in last 60 minutes, RCS pressure 400 psig

C. Cooldown from 460^{O}F to current RCS temperature of 320^{O}F in last 30 minutes, RCS pressure 200 psig

D. Cooldown from 355^{O}F to current RCS temperature of 250^{O}F in last 60 minutes, RCS pressure 1200 psig

ANSWER: %Answer%
For PTS to occur the following 4 items are required.
There must be a thermal shock event of greater than 100□F in a one hour period.
A relatively high pressure must exist in the RCS.
The vessel wall temperature must be in the brittle fracture region.
A flaw located at a critical section of the reactor vessel must exist. It must be of the correct size, shape, and orientation and exist within the vessel wall.
This cooldown was 105^{O}F in the last 60 minutes and RCS temperature is low with a high RCS pressure. (To the left of Limit A)

A - Incorrect - The RCS had a large cooldown with a high pressure but the RCS temperature is NOT yet low enough to be a major concern.
B - Incorrect - The RCS had a large cooldown but the RCS temperature is NOT yet low enough to be a major concern. and RCS pressure is low.
C - Incorrect - Cooldown is at 100F limit but RCS pressure is very low.
Lesson Plan/Objective:RO-C-EOP12/#6

Reference:RO-C-EOP12, Integrity CSFST, FR-P Series EOPS, and Background Information pg. 12
02-OHP-4023-F-0.4, Integrity Status tree pg. 1-2
Pressurized Thermal Shock
Emergency Procedures/Plan
Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control; 2. Core cooling and heat removal; 3. Reactor coolant system integrity; 4. Containment conditions; 5. Radioactivity release control.
RO-3.7 SRO-4.3

86. 117 1
Answer: C
Unit 2 experienced a Safety Injection and Containment Spray actuation due to a large break LOCA. 02-OHP-4023-E-1, Loss of Reactor or Secondary Coolant is being performed following a transition from 02-OHP-4023-E-0, Reactor Trip or Safety Injection. The STA has just made his initial scan of the Status Trees.

<u>The following conditions exist</u>
- Pressurizer level is 0%
- Cnmt pressure is 2.8 psig
- Containment rad monitors ERS-2300 and ERS-2400 are in ALARM.
- NLI-330/331 "MIN RECIRC LEVEL" lights are Lit.
- NLI-340/341 "FLOOD LEVEL" lights are Lit.

Which of the following procedures must be entered to address the above conditions?
A. 02-OHP-4023-FR-I.2, Response to Low Pressurizer Level

B. 02-OHP-4023-FR-Z.3, Response to High Containment Radiation Level

C. 02-OHP-4023-FR-Z.2, Response to Containment Flooding

D. 02-OHP-4023-FR-Z.1, Response to High Containment Pressure

ANSWER: %Answer%
Based on the indications presented the next procedure performed would be 02-OHP-4023-FR-Z.2 as indicated by the Flood Level lights being lit.

A - Incorrect - 02-OHP-4023-FR-I.2, is a lower priority procedure.
B - Incorrect - 02-OHP-4023-FR-Z.3, is a lower priority procedure.
D - Incorrect - 02-OHP-4023-FR-Z.1, is NOT required with Containment pressure <3 psig.
Lesson Plan/Objective:RO-C-EOP13/#4

Reference:02-OHP-4023-F-0.5, Containment Status Tree

Containment Flooding
Emergency Procedures/Plan
Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.
RO-4.0 SRO-4.3

87. 118 2
Answer: B
A LOCA that resulted in significant core damage occurred at 1600 hours. Containment Pressure and Radiation levels were recorded as follows:

Time	1630	1700	1730	1800	1830
Radiation R/Hr	950,000	950,000	950,000	950,000	90,000
Pressure psig	6.2	5.6	5.2	4.5	4.0

At 1835 hours, while performing Emergency Operating Procedures, a step is encountered which states 'Check PRZ level - GREATER THAN 19% [22% ADVERSE]'

Which ONE of the following describes the required Pressurizer level and why?

A. 19% because adverse values are no longer required because of the limited integrated dose and pressure reduction.

B. 22% because adverse values must be used until the integrated dose has been evaluated for lasting effects.

C. 22% because adverse containment exists due to the current containment radiation dose rate.

D. 22% because adverse containment exists due to the current containment pressure.

ANSWER: %Answer%
Adverse containment values are required to be used when containment pressure is >5 psig or >10^5 R/Hr. When pressure lowers to <5 psig normal values may be used as long as the integrated dose is <10^6 R. At the levels specified here the integrated dose is above 10^6 R (9.5R/Hr x10^5 for 90 minutes) and so the instruments must be evaluated for lasting effects of the radiation.

A - Incorrect - The integrated dose is too high to allow normal values to be used.
C - Incorrect - The current Dose Rate is <10^5R/Hr.
D - Incorrect - Pressure is <5 psig.

Lesson Plan/Objective:RO-C-EOP01 / #9

Reference:OHI-4023, Abnormal / Emergency Procedure User's Guide, Attachment 2 pg. 34

High Containment Radiation
Knowledge of the interrelations between the High Containment Radiation and the following:
Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features
RO-3.0 SRO-3.3

88. 119 2
Answer: C

Unit 1 is in MODE 4 with the RCS at 260^{O}F and the pressurizer level at 45%.
Both Centrifugal Charging pumps are OPERABLE.

Pressurizer PORV NRV-152 lost control power 2 hours ago. Appropriate actions have been implemented.

Instrument Maintenance has just requested permission to begin a routine calibration of RCS Wide Range Pressure Channel NPS-121.

Which ONE of the following correctly describes your response to this request and the reason? (see attached 01-OHP-4021-001-001 Figure 1 Admin and TS 3.4.9.3 LTOP Determination Table)

A. Allow testing to begin. Pressurizer PORV NRV-151 and NRV-153 are still OPERABLE for LTOP.

B. Allow testing to begin. Pressurizer PORV NRV-152 is already INOPERABLE for LTOP so work may be performed on RCS Wide Range Pressure Channel NPS-121.

C. Do NOT allow testing. Pressurizer PORV NRV-152 is already INOPERABLE for LTOP so work should NOT be performed on RCS Wide Range Pressure Channel NPS-121.

D. Do NOT allow testing. One CCP must be tagged out before Pressurizer PORV NRV-153 may be made inoperable.

ANSWER: %Answer%
Mode 4 Administrative LTOP requirements require 2 PORVs with a lift setting of 435 psig or less and the RHR suction relief (loss of 1 PORV requires restoration in 24 hours). RCS Wide Range Pressure Channel NPS-121 provides LTOP pressure input to NRV-153. Work on this channel would make NRV-153 Inoperable.

A - Incorrect - Automatic Operation is required but would NOT be available for NRV-151 or 153.
B - Incorrect - NRV-152 is supplied from NPS-122
D - Incorrect - Reduction to MODE 5 with One CCP is required.
Lesson Plan/Objective:RO-C-ADM03/ADM03.2

Reference:01-OHP-4021-001-001 Figure 1 Admin and TS 3.4.9.3 LTOP Determination Table pg 96-97

Pressurizer Pressure Control System (PZR PCS)
Equipment Control
Knowledge of the process for managing maintenance activities during shutdown operations.
RO-2.3 SRO-3.6

Provide Attachment - 01-OHP-4021-001-001 Figure 1 Admin and TS 3.4.9.3 LTOP Determination Table

89. 120 4
Answer: D
Unit 2 is being returned to full power following a refueling outage when the following indications are received in the control room:

- Annunciator 207, Drop 1, LOOP 1 RCP 1 TRIP OR LOW FLOW alarms.
- Annunciator 207, Drop 11, LOOP 1 RTD BYP FLOW LOW alarms.
- Annunciator 207, Drop 30, RCP MOTOR OVERLOAD TRIP alarms.
- Annunciator 211, Drop 31, LOOP 1 DELTA-T LO DEV alarms.

The control room operators check the reactor. Reactor power is 14% and rising.

The control room operators are required to:
A. stop the power rise and investigate the failure of the RCS Loop Flow channel.

B. stop the power rise and investigate the failure of the RCP Breaker Indication.

C. be in HOT STANDBY in 1 hour.

D. manually trip the reactor.

ANSWER: %Answer%
The combination of alarms indicate a tripped RCP. Since the plant is NOT Licensed for operation on 4 loops a reactor trip is required.

A - Incorrect - The low flow, delta-T, and breaker alarms indicate that the breaker has tripped open.
B - Incorrect - The low flow, delta-T, and breaker alarms indicate that the breaker has tripped open.
C - Incorrect - This is the Technical Specification requirement but operation with 3 loops is NOT allowed.

Lesson Plan/Objective:RO-C-00201/#15

Reference:Annunciator #207 Response: Reactor Coolant Drop 1 LOOP 1 RCP 1 TRIP OR LOW FLOW pg. 1-2

Non-Nuclear Instrumentation System (NNIS)
Emergency Procedures/Plan
Ability to prioritize and interpret the significance of each annunciator or alarm.
RO-3.3 SRO-3.6

90. 121 1
Answer: D
An AEO performing rounds identifies that the TDAFW pump discharge valves for Unit 1 are throttled while the Unit 2 valves are fully open. The AEO requests permission to reposition the Unit 1 valves to be fully open.

Which ONE of the following describes the required response?

A. Change the Unit 1 Valve Positions to the FULL OPEN position.

B. Do NOT change Unit 1 Valve Positions. The Unit 2 valves should be placed in the THROTTLED position.

C. Change the Unit 1 Valve Positions to the FULL OPEN position and change the Unit 2 valves to the THROTTLED position.

D. Do NOT change Unit 1 Valve Positions. The Unit 1 valves should be in the THROTTLED position. The Unit 2 valves should be in the FULL OPEN position.

ANSWER: %Answer% - The Unit 1 valves should be THROTTLED due to SG overfill concerns. The Unit 2 valves should be FULL OPEN.

A - Incorrect - The Unit 1 valves should be THROTTLED due to SG overfill concerns.
B - Incorrect - The Unit 2 valves should be FULL OPEN.
D - Incorrect - The Unit 1 valves should be THROTTLED due to SG overfill concerns. The Unit 2 valves should be FULL OPEN.

Lesson Plan/Objective:RO-C-05600 / #8

Reference: 01-OHP-4021-056-002, Auxiliary Feed Pump Operation Attachment 1 pg. 21-24
02-OHP-4021-056-002, Auxiliary Feed Pump Operation Attachment 1 pg. 21

Reference:
Auxiliary / Emergency Feedwater (AFW) System
Equipment Control
(multi-unit) Knowledge of the design, procedural, and operational differences between units.
RO-3.1 SRO-3.3

91. 122 1
Answer: B
Both Units are at full power with three hours left until shift turnover with the following shift manning:

	UNIT 1	UNIT 2	Shared
Shift Manager			1
WCC-SRO			1
Unit Supervisor	1	1	
Reactor Operator	2	2	
Qualified Operator (AEO)	3	3	2
Shift Technical Advisor			1

The Unit 1 Unit Supervisor and a Unit 1 Qualified Operator are injured during a midshift plant tour and are taken to first aid for treatment and observation.

Per Technical Specifications, which ONE of the following actions must be taken if this condition exists until shift turnover?

Unit 1 minimum shift crew composition is ...

A. met provided the STA assumes the Unit 1 Unit Supervisor position.

B. met provided the WCC-SRO assumes the Unit 1 Unit Supervisor position.

C. NOT met and the unit must enter T.S.3.0.3 if the proper crew composition is not met within 2 hours.

D. NOT met and no further action is required other than the continual efforts to restore crew composition.

ANSWER: %Answer%
Per Technical Specifications 1 Unit Supervisor per unit is required. The WCC-SRO is not a Tech Spec required position so he may assume the Unit Supervisor position.

A - Incorrect - Shift Technical advisor is still a required position. Additionally most STAs are NOT Licensed.
C - Incorrect - TS 3.0.3 is Not Applicable for Section 6
D - Incorrect - The Unit 1 Supervisor position needs to be filled.
Lesson Plan/Objective:RO-C-ADM01/#1

Reference:Technical Specification 6.2.2 pg. 6-2 to 6-3

Generic
Conduct of Operations
Knowledge of shift staffing requirements.
RO-2.3 SRO-3.4

92. 123 1
Answer: D
Given the following:

- You are the Unit Supervisor
- A Loss of offsite power has occurred.
- All Emergency Diesel Generators started and energized the busses as required.
- An RCS Leak inside containment has damaged the RHR pump suction from Loop 2 hot leg valve ICM-129.
- The plant is being cooled down to Cold Shutdown per the Electrical Power and RCS leakage Tech Spec Action Statements.
- Tech Spec 3.4.1.3, Hot Shutdown, requires 2 RCS loops to be operable and 1 in operation for Mode 4 Operation.
- The STA states that you should stabilize the plant at 375°F and NOT enter Mode 4.

Do you agree or disagree and why?

A. Agree, Tech Spec 3.0.4 prohibits mode changes if all applicable tech specs for that mode are not met.

B. Agree, without RCPs operating and no RHR for cooldown it will not be possible to maintain RCS temperature less than 350°F on SG PORVs.

C. Disagree, a standing Notice of Enforcement Discretion is in place to allow the plants to continue to lower modes even if they don't meet all Tech Specs.

D. Disagree, Tech Spec 3.0.4 allows you to pass through modes without meeting all conditions if you are complying with a required action statement of another Tech Spec.

ANSWER: %Answer% - Tech Spec 3.0.4 allows you to pass through modes without meeting all conditions if you are complying with a required action statement of another Tech Spec.

A - Incorrect - Tech Spec 3.0.4 allows you to pass through modes without meeting all conditions if you are complying with a required action statement of another Tech Spec.
B - Incorrect - It is possible to cooldown and maintain temperature on Natural Circulation using SG PORVs.
C - Incorrect - A standing Notice of Enforcement Discretion does NOT exist.

Lesson Plan/Objective:RO-C-ADM01 / #19

Reference: Tech Spec 3.0.4 pg 3/4 0-1 and Bases pg. B3/4 0-1

Generic
Conduct of Operations
Knowledge of conditions and limitations in the facility license.
RO-2.7 SRO-3.9

93. 124 2
Answer: B
You are the Unit 1 Unit Supervisor.
A credible insider threat has resulted in activation of the Vital Area Two-Person Line-Of-Sight Rule. An AEO requests permission to suspend the Two-Person Line-Of-Sight Rule so that he may proceed to rack and tag out the Unit 1 East CCP for an oil change. There are no other operators currently available to assist him.

Which ONE of the following describes the correct response to this request?
(see attached PMP-2060-SEC-006 Security Requirements for Plant Personnel Attachment 4)
The Two-Person Line-Of-Sight Rule..

A. may NOT be suspended but you may assign a Security officer to accompany the Operator to rack the breaker out.

B. may NOT be suspended, you must wait until another operator becomes available.

C. may be suspended since it is optional for Operations personnel.

D. may be suspended if approved by the Shift Manager.

ANSWER: %Answer%
Suspension of the rule is allowed with Shift manager and SRO concurrence only if personnel or plant safety would be adversely impacted. The rule requires two individuals that are knowledgeable with the task being performed, so the operator must wait until another operator is available.

A - Incorrect - The rule requires two individuals that are knowledgeable with the task being performed. a security officer would not be familiar with the task.
C - Incorrect - The rule is not optional for operations.
D - Incorrect - An oil change does NOT meet the criteria for suspension.
Lesson Plan/Objective:

Reference:PMP-2060-SEC-006 Security Requirements for Plant Personnel Attachment 4 pg 32

Generic
Conduct of Operations
Knowledge of facility requirements for controlling vital / controlled access.
RO-2.0 SRO-2.9

Provide Attachment - PMP-2060-SEC-006 Security Requirements for Plant Personnel Attachment 4

94. 125 1
Answer: C
Unit 2 at 100% with Emergency Diesel Generator 2AB out of service due to contaminated fuel oil. The diesel was declared inoperable at 1100 on 3/15/04.

At 1600 on 3/15/04, the plant experiences a trip due to a spurious reactor trip signal generated during Instrument Maintenance testing.

At 2200 on 3/15/04, while maintaining the plant in Hot Standby, Annunciator Panel 204 Drop 86 CCW FROM EAST CCP PUMP FLOW LOW, alarms.

Investigation shows CCW flow to East CCP has been lost due to an apparent valve stem/disc separation. CCW flow to the West CCP is normal.

Which ONE of the following describes the status for plant startup?

The plant may...

A. be taken critical and power operations continued as long as Emergency Diesel Generator 2AB is restored to service by 1100 on 3/18/04.

B. be taken critical and power operations continued as long as East CCP is restored to service by 2200 on 3/18/04.

C. NOT be taken critical and must be in Cold Shutdown by 0600 on 3/17/04.

D. NOT be taken critical and must be in Cold Shutdown by 1200 on 3/17/04.

ANSWER: %Answer%
Explanation:With 2AB EDG inoperable, for the West CCP to be considered operable its normal power source must be operable AND the East CCP must be operable. The given condition results in East CCP being inoperable. This places the plant in the requirements of TS 3.0.5 requiring restoration in 2 hours or Hot Shutdown in 6 and Cold Shutdown in 24 hours. (6 hours to Hot Standby is lost).

A - Incorrect - Both CCPs are Inoperable.
B - Incorrect - Both CCPs are Inoperable
D - Incorrect - This time includes the 6 hours to Hot Standby.

Lesson Plan/Objective:RO-C-03200/#19

Reference:Technical Specification 3.0.5 pg. 3/4 0-1

Generic
Equipment Control
Knowledge of limiting conditions for operations and safety limits.
RO-3.4 SRO-4.1

95. 126 2
Answer: D
Unit 2 is in Mode 6 with the refueling cavity level at 644 ft. 9.5 inches (23 ft. 8 inches above flange). The East RHR pump is operating in the shutdown cooling mode.
Maintenance has requested that the West RHR pump breaker be swapped with a refurbished breaker. The breaker swap and a functional test is expected to take 45 minutes.

Which ONE of the following describes the correct response and the reason?

This activity is ..

A. NOT allowed because two RHR pumps are required to provide adequate circulation in the event of a boron dilution incident.

B. NOT allowed because a standby RHR pump is required to provide alternate core cooling if the operating RHR pump trips.

C. allowed as long as the standby pump is removed for less than 1 hour since this minimizes the risk from a dilution incident.

D. allowed because one RHR pump is sufficient to provide adequate cooling capacity to remove decay heat and adequate circulation in the event of a boron dilution incident.

ANSWER: %Answer%
In Mode 6 with >23ft above the vessel flange only one RHR pump is required to be Operating (and Operable). This is because one pump ensures sufficient cooling capacity to remove decay heat and maintain the RCS <140^{O}F and sufficient coolant circulation is maintained to minimize effects of a boron dilution incident.

A - Incorrect - Only one pump is required.
B - Incorrect - Only one pump is required.
C - Incorrect - The operating pump may be stopped for one hour.
Lesson Plan/Objective:RO-C-01700/#13

Reference:Technical Specification 3.9.8.1, Refueling Operations – RHR and Coolant Circulation pg. 3/4 9-8 and Bases pg. B3/4 9-2
02-4030-227-037 Refueling Surveillance Data Sheet 3 Step 5 pg. 39

Generic
Equipment Control
Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.
RO-2.5 SRO-3.7

96. 127 1
Answer: B
You are the Unit Supervisor and are briefing two operators on a system startup lineup. The system requires dual verification. The operators note that a drain valve on the lineup is located in a Locked High Radiation Area (LHRA). No maintenance has been performed on this portion of the system. The dose rate in the area of the valve is 1.5 Rem/hr. The task is expected to take 10 minutes.

Which ONE of the following methods will result in the LOWEST exposure AND still meet procedural requirements?

A. Direct the operators to perform the initial valve position check, waive the independent verification and note the exemption on the lineup sheet.

B. Waive both the initial check and independent verification and note the exemption on the lineup sheet.

C. Submit a request to the ALARA committee to grant a waiver to both the initial check and independent verification.

D. Submit a request to Radiation Protection to have shielding installed to reduce the dose rate prior to conducting the verification.

ANSWER: %Answer%
Components located in a high radiation area may be waived at the discretion of the supervisor with operational control. The exemption will be noted on the lineup sheet.

A - Incorrect - This would met the lowest exposure criteria.
C - Incorrect - The ALARA committee does NOT make this determination
D - Incorrect - This would result in exposure to both the operators and those installing shielding.
Lesson Plan/Objective:RO-C-ADM02/ADM02.9.0

Reference:PMP-4043-VLU-001 Valve Lineups and Position Control Section 3.5.4 pg 10

Generic
Radiological Controls
Knowledge of facility ALARA program.
RO-2.5 SRO-2.9

97. 128 1
Answer: D
Which ONE of the following must be performed by a Unit Supervisor?

A. Performing independent verification of the lineup for a gas decay tank release.

B. Determining/approving the GDT Release Header to Aux Bldg Vent Stack Pressure Reducing Valve setting for a gas decay tank release.

C. Performing independent verification of the lineup to place a cover gas on the CVCS HUT.

D. Determining/approving which CVCS Holdup Tank to Vent Header Shutoff Valve is required to be Sealed Open when placing a cover gas on the CVCS HUT.

ANSWER: %Answer%
Unit Supervisor Selection/approval is required when determining which CVCS Holdup Tank to Vent Header Shutoff Valve is required to be Sealed Open.

A - Incorrect - The Unit Supervisor does NOT need to perform the independent verification.
B - Incorrect - The pressure setting is specified in the procedure.
C - Incorrect - The Unit Supervisor does NOT need to perform the independent verification.

Lesson Plan/Objective:RO-C-ADM01/#17

Reference:12-OHP-4021-023-001, Operation of the Waste Gas System Attachment 4 pg. 16-23

Generic
Radiological Controls
Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).
RO-1.8 SRO-2.9

98. 129 3
Answer: D
The following Cook Plant dose histories exist for four operators: (No dose has been received from other sites)

Operator	Bill	Mick	Charlie	Keith
Deep Dose Equivalent (DDE)	1.803 rem	1.890 rem	1.829 rem	1.869 rem
Shallow Dose Equivalent (SDE)	23 mrem	118 mrem	39 mrem	120 mrem
Committed Dose Equivalent (CDE)	1.968 rem	1.905 rem	1.767 rem	1.819 rem
Committed Effective Dose Equivalent (CEDE)	91 mrem	17 mrem	91 mrem	69 mrem

An Activity in Containment requires 2 operators to work in an area with a dose rate of 200 mrem/hr for 25 minutes.

Which ONE of the following sets of operators would EXCEED their annual Administrative Dose Limit (ADL) for Total Effective Dose Equivalent (TEDE) if assigned to perform this activity?

A. Mick and Keith

B. Bill and Mick

C. Bill and Charlie

D. Charlie and Keith

ANSWER: %Answer% - This activity would result in a dose of 83.3 mrem/operator. The Cook ADL for TEDE is 2 rem/yr. This means that an operator with a current TEDE of >1.917 would exceed their limit. TEDE = DDE + CEDE
Current TEDEs are:

Bill:	1.803 + .091 = 1.894 Rem
Mick:	1.890 + .017 = 1.907 Rem
Charlie:	1.829 + .091 = 1.920 Rem
Keith:	1.869 + .069 = 1.938 Rem

A - Incorrect - Mick would not exceed ADL.
B - Incorrect - Bill and Mick would not exceed ADL.
C - Incorrect - Bill would not exceed ADL.

Lesson Plan/Objective: RO-C-ADM01/#22

Reference: PMP-6010-RPP-100, Radiation Exposure Monitoring, Reporting, and Dose Control ; THP-6010-RPP-101, Preparation And Control Of Exposure Records And Reports

Generic
Radiological Controls
Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.
RO-2.5 SRO-3.1

99. 130 3
Answer: A
Unit 2 was operating at 100% power with the West CCW pump Tagged Out. The East CCW pumps trips resulting in the loss of CCW.

Which ONE of the following describes the correct Operator response?

Immediately trip the Reactor and RCPs and implement...

A. 02-OHP-4023-E-0, Reactor Trip or Safety Injection. 02-OHP-4022-016-004, Loss of CCW may be performed concurrently after the immediate actions are complete.

B. 02-OHP-4023-E-0, Reactor Trip or Safety Injection. 02-OHP-4022-016-004, Loss of CCW is NOT needed since the EOP network addresses a loss of CCW.

C. 02-OHP-4023-E-0, Reactor Trip or Safety Injection. Steps from 02-OHP-4022-016-004, Loss of CCW may NOT be performed until completion of 02-OHP-4023-ES-0.1, Reactor Trip Response.

D. 02-OHP-4022-016-004, Loss of CCW until restoration of CCW from any source. Perform 02-OHP-4023-E-0, Reactor Trip or Safety Injection steps as time allows.

ANSWER: %Answer%
OHI-4023, Abnormal/Emergency Procedure User's Guide allows Abnormal Procedures to be implemented concurrently with Emergency Procedures.

B - Incorrect - Performance of 02-OHP-4023-E-0 is required upon the reactor trip, but the operators must perform 02-OHP-4022-016-004 to address the loss of CCW.
C - Incorrect - User's Guide allows Abnormal Procedures to be implemented concurrently with Emergency Procedures.
D - Incorrect - The Unit Supervisor should direct action of 02-OHP-4023-E-0.
Lesson Plan/Objective:RO-C-EOP01/#25

Reference:OHI-4023 Abnormal/Emergency Procedure User's Guide pg. 20

Generic
Emergency Procedures/Plan
Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.
RO-3.0 SRO-3.7

100. 098 4
Answer: D
The following conditions exist:
- On your shift, a monthly surveillance item is discovered overdue.
- PLANT DUE DATE was March 24, 2004.
- Assume today is March 29, 2004 and the performance of the Surveillance Test has begun.
- The previous surveillance tests for this component/system were Due and Completed as shown below.

PLANT DUE DATE	COMPLETED DATE
December 31	January 2
January 30	January 31
February 28	February 25

Which ONE of the following statements describes the status of the component/system and the justification for that status?

A. The surveillance test has been missed and the component/system must be declared INOPERABLE until the test is verified completed satisfactorily.

B. The component/system is OPERABLE because the TECHNICAL SPECIFICATION DUE DATE has NOT been exceeded.

C. The component/system is INOPERABLE because 3.25 times the time interval for three consecutive test has been exceeded.

D. The component/system is OPERABLE because the TECHNICAL SPECIFICATION DROP DEAD DATE has NOT been exceeded.

ANSWER: %Answer% Tech Specs allows a grace period of 25%. For a Monthly surveillance (Monthly = 31 days) this would be 7 days. The time extension of 7 days has not been exceeded from the March 27 TECHNICAL SPECIFICATION DUE DATE (Note that the PLANT DUE DATE is calculated based on 28 days). Additionally TS 4.0.3 allows for a 24 hour delay when discovering a surveillance NOT performed within it's specified interval.

A - Incorrect - A time extension is allowed.
B - Incorrect - The TECHNICAL SPECIFICATION DUE DATE is 31 days from the last performance which would be March 27.
C - Incorrect - 3.25 times has not been exceeded for the last three times.

Lesson Plan/Objective: RO-C-TS01 /#12

Reference: Technical Specification - Section 4 Applicability pg. 3/4 0-2 & 0-3 PMP-4030-SCH-001, Scheduling Of Surveillance Testing pg. 3-7

Generic
Equipment Control
Knowledge of surveillance procedures.
RO-3.0 SRO-3.4