

Duane Arnold Energy Center

Reactor Operator

50007

Topic: 2001 ILC SRO Written Exam

Rev. 1

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Available Responses: 100

ANSWER KEY

Number Correct: _____

SCORE: _____%

Graded By: _____

Reviewed By: _____

Student's Name: _____
Print

Date: _____

LEAVE EXAM WITH INSTRUCTOR/PROCTOR PRIOR TO LEAVING EXAM ROOM.

EXAM REVIEW SECTION - PLEASE SIGN IN BLACK INK

I ACKNOWLEDGE THAT I HAVE PARTICIPATED IN THE REVIEW OF THIS DOCUMENT
AND HAVE HAD AN OPPORTUNITY TO ASK QUESTIONS.

Student's Signature

Date

1. The Electrical grid and site transformers have been restored following a Loss of Offsite Power. The OSS directs you, as the 1C08 panel operator, to transfer 1A3 from the "A" Standby Diesel Generator (SBDG) to the Startup transformer.
- The BUS 1A3 TRANSFER breaker mode selector switch is placed in MANUAL.
 - The handle for the SYNCHRONIZE switch is inserted into 4KV BREAKER 1A302 STARTUP TRANSFORMER TO BUS 1A3 and placed in the ON position.

At this point you observe that the synchroscope is rotating slowly in the COUNTER CLOCKWISE direction.

Which of the following CORRECTLY describes the operational implications of these synchroscope indications while preparing for breaker closure?

- a. "A" SBDG speed must be RAISED to achieve proper synchroscope rotation for breaker closure because it is the RUNNING source.
- b. "A" SBDG speed must be LOWERED to achieve proper synchroscope rotation for breaker closure because it is the RUNNING source.
- c. This is the accepted direction of rotation for breaker closure when an Offsite source is the INCOMING source.
- d. The System Operations Center (SOC) must adjust synchroscope rotation for breaker closure because the Offsite source is the INCOMING source.

ANSWER: b

Note: Synchroscope must be moving slowly in the CLOCKWISE direction for breaker closure.

Distracter 1: A SBDG is almost always the incoming source, but not in this situation. If it were incoming, raising would be the correct direction of adjustment.

Distracter 2: Rare situation; Plausible if candidate does not understand synchronization principles.

Distracter 3: Rare situation; Plausible if candidate does not understand synchronization principles.

REFERENCE: OI-304.2

K/A System: 262001 (A.C. Electrical Distribution)

K/A Number: K5.01 (Knowledge of the operational implications of the following concepts as they apply to A.C. Electrical Distribution: Principle involved with paralleling two A.C. sources.)

K/A Value: 3.1/3.4

Objective: Task 15.08 Transfer essential bus from SBDG to Startup transformer.

Cognitive Level: 3-SPK

Source: NEW

2. Both Reactor Recirculation pumps were running at 70% speed when an internal component failure in the "B" MG SET SPEED CONTROL caused the controller speed demand output signal to instantaneously fail to the MAXIMUM value.

Which of the following CORRECTLY describes the expected affect of this failure on core flow?

Core flow will rise until...

- the "B" Recirc Scoop Tube Positioner reaches its ELECTRICAL STOP.
- the "B" Recirc Scoop Tube Positioner reaches its MECHANICAL STOP.
- a "B" Recirc Scoop Tube Positioner LOCK-UP occurs due to high milliamp output signal from the controller.
- a "B" Recirc Scoop Tube Positioner LOCK-UP occurs due to high deviation between the controller demand and the Positioner position.

ANSWER: d

Distractor 1: Positioner has an electrical stop , but the deviation lockup should occur much sooner.

Distractor 2: Positioner has an mechanical stop , but the deviation lockup should occur much sooner.

Distractor 3: Milliamp output is something that is checked after a lockup but it does not cause the lockup.

REFERENCE: SD-264; ARP 1C04B, C-2

K/A System: 202002 (Recirculation Flow Control System)

K/A Number K3.01 (Knowledge of the effect that a loss or malfunction of the Recirculation Flow Control System will have on the following: CORE FLOW.)

K/A Value: 3.5/3.5

DAEC Objective: 12.00.00.02 Identify the conditions that allow or causes the following to occur:

c. Scoop Tube Lock-up

Cognitive Level: 1-I

Source: NEW

3. A plant startup is in progress with reactor power at 65% and both Recirc MGs at 50% speed. "A" Recirc MG receives a scoop tube lockup due to a failed instrument.

What is the highest speed that the "B" Recirc MG would be allowed to be taken to while "A" Recirc MG troubleshooting is on-going?

- a. 50%
- b. 61%
- c. 67.5%
- d. 79.3%

ANSWER: c

Distracter 1, 2, 3: Per Technical Specifications, and P & L # 14, the speed of the faster MG shall not exceed 135% of the slower MG when reactor power is less than 80%.

REFERENCE: OI-264, Reactor Recirculation System

K/A System: 202002 (Recirculation Flow Control System)

K/A Number: A1.01 (Ability to predict and/or monitor changes in parameters associated with operating the Recirculation Flow Control System controls including: RECIRCULATION PUMP SPEED.)

K/A Value: 3.2/3.2

DAEC Objective: 12.01.01.02

Relate the Precautions and Limitations, operating cautions, or procedural notes of OI-264, Reactor Recirculation System, and any applicable ARP, to any component or Recirc System operating status.

Cognitive Level: 3-SPK

Source: Exam Bank

4. The following plant conditions exist after a Loss of Coolant Accident:

- All control rods are fully inserted.
- Containment Sprays have failed.
- Emergency Depressurization has been performed.
- Average Drywell Air Temperature is 320°F and rising slowly.
- RPV Flooding is in progress due to loss of RPV water level indications.
- Torus Average Water temperature is 150°F and rising slowly.
- The 3 available RHR pumps are injecting into the RPV at 14400 gpm.
- Torus Water level is 10.0 ft and lowering steadily due to RPV injection.

The 1C03 operator reports the following trends to you, the OSS:

- RHR loop flows are lowering slowly.
- RHR Pump Amps are lowering slowly.
- RHR Pump discharge pressure is rising slowly.

Which of the following would account for these indications?

- a. The RPV is full.
- b. The RHR suction strainers are becoming blocked.
- c. The elevated Drywell air temperature is affecting the RHR system indications.
- d. The lowering Torus Level and rising Torus Temperature are affecting RHR Pump NPSH.

ANSWER: a

Distracter 1: Would cause lowering or erratic flow and amps but not rising discharge pressure.

Distracter 2: Drywell air temp is very elevated and has caused the loss of RPV level indications but has no affect on the trends provided.

Distracter 3: Would cause lowering or erratic flow and amps but not rising discharge pressure.

REFERENCE: RPV Flood: SEP 305

K/A System: 203000 (Residual Heat Removal/Low Pressure Coolant Injection)

K/A Number: 2.4.47 (Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.)

K/A Value: SRO 3.7

Objective: SRO 2.06.01.12 Evaluate plant conditions and control room indications to determine if the RHR System is needed to be running in any particular mode, is operating as expected and/or is no longer needed and identify any actions that may be necessary to place the RHR System in the correct lineup.

Cognitive Level: 3 SPK

Source: New Question

5. The plant is performing a normal cooldown. The following conditions exist:

Reactor pressure	500 psig
Reactor water level	190"
RPV cooldown rate	30°F/hr
HPCI pump discharge pressure	525 psig
HPCI system flow	3100 gpm
HPCI is operating in CST-to-CST using the FIC in AUTO	

The Shift Supervisor directs you to increase the cooldown rate to as high as possible but not to exceed 80°F/hr. Which of the following accurately describes how the increase of the cooldown rate would be accomplished?

- Shift the FIC to MANUAL and raise turbine speed to raise HPCI system flow.
- Throttle CLOSED CV-2315, Test Bypass Valve, to raise HPCI pump discharge pressure.
- Control HPCI on the Test Pot and raise turbine speed, to raise HPCI pump discharge pressure, and throttle CV-2315 OPEN to raise system flow.
- Secure the CST-to-CST lineup and lineup to inject into the RPV. Adjust turbine speed with the FIC until HPCI discharge pressure is 100 psig greater than RPV pressure.

ANSWER: b

Distracter 1: The FIC should be left in AUTO control.

Distracter 2: The FIC should be left in AUTO control and opening CV-2315 lowers discharge pressure.

Distracter 3: It is unnecessary to inject into the RPV to raise discharge pressure.

REFERENCE: Generic Fundamentals, Chapter 2, Pumps page 21

K/A System: 206000 (High Pressure Coolant Injection)

K/A Number: A4.06 (Ability to manually operate and/or monitor in the control room: REACTOR PRESSURE.)

K/A Value: 4.3/4.3

DAEC Objective: 5.02.01.03

Evaluate plant conditions and control room indications to determine if the HPCI System is operating as expected, and identify any actions that may be necessary to place the HPCI System in the correct lineup.

Cognitive Level: 2-RI

Source: New Question

6. HPCI is running normally in the CST to CST mode with the following air operated valves in their expected positions:

- CV-2211 HPCI STEAM LINE DRAIN ISOL (Inboard) CLOSED
- CV-2212 HPCI STEAM LINE DRAIN ISOL (Outboard) CLOSED
- CV-2234 CLOSED RADWASTE DISCH ISOL (Inboard) CLOSED
- CV-2235 CLOSED RADWASTE DISCH ISOL (Outboard) CLOSED
- CV-2315 TEST BYPASS THROTTLED OPEN

Which of the following would describe the operating status of these valves and the HPCI System IN THE NEXT 10 MINUTES if a COMPLETE LOSS of Instrument and Service Air were to occur?

(Do not assume any HPCI initiations, trips or isolations resulting from the loss of Air transient.)

- a. There would be NO CHANGE to these valve positions and HPCI would continue to operate in the CST-CST mode.
- b. The inboard drains, CV-2211 and CV-2234, would be failed OPEN and HPCI would continue to operate in the CST-CST mode.
- c. The outboard drains, CV-2212 and CV-2235, would be failed OPEN and HPCI would continue to operate in the CST-CST mode.
- d. CV-2315 TEST BYPASS would be failed CLOSED resulting in a shutdown of CST to CST flow and opening of the Minimum Flow valve.

ANSWER: a

Note: Implicit in this question is whether or not the OSS will have HPCI available for RPV pressure control after the reactor scram.

Distracter 1,& 2: Inboard or outboard logics do not matter and these valves do not have accumulators, so they all fail closed.

Distracter 3: Test Bypass does fail closed, but not in the next 10 minutes because of an accumulator that is designed to keep the valve open for 8 hours.

REFERENCE: SD-152

K/A System: 295019 (Partial or complete loss of Instrument Air)

K/A Number: A2.02 (Ability to determine and/or interpret the following as they apply to Partial or complete loss of Instrument Air: Status of safety related instrument air loads.)

K/A Value: 3.6/3.7

DAEC Objective: RO 5.01.01.02 Given HPCI operating mode and various plant conditions, predict how HPCI will be impacted by the following support system failures: l. Inst. and Service Air systems
SRO 5.17.06.01 Explain which systems have associated accumulators and describe the extended operation time allowed by accumulators.

Cognitive Level: 2-RI

Source: NEW

7. Which combination of MCCs, if de-energized, would prevent the operation of both of the Core Spray Subsystems Injection Valves from the control room?
- a. 1D41 / 1D42
 - b. 1B33 / 1B45
 - c. 1B34 / 1B44
 - d. 1B35 / 1B43

ANSWER: c

Note: MO-2115 and MO-2117 are powered from 1B34, MO-2135 and MO-2137 are powered from 1B44.

Distracter 1: Both are 250 VDC busses in Rx Bldg. Selected if candidate thinks these loads are DC.

Distracter 2: Both are essential 480VAC busses, but are in the Turbine Bldg. and supply mainly TB essential loads.

Distracter 3: Both are essential 480VAC busses but these busses load shed during a LOOP –LOCA; a bad feature for ECCS pumps.

REFERENCE: OI-151, Core Spray, Attachment 1

K/A System: 209001 (Low Pressure Core Spray)

K/A Number: K2.02 (Knowledge of the electrical power supplies to the following:
VALVE POWER.)

K/A Value: 2.5/2.7

DAEC Objective: 4.01.01.10

Given a Core Spray System operating mode and various plant conditions, predict how the Core Spray System will be impacted by the following support system failures: A. C. DISTRIBUTION.

Cognitive Level: 1-F

Source: New Question

8. The “B” RHR Loop was placed in Shutdown Cooling 12 hours ago after a normal shutdown.

Current conditions are as follows:

- RPV water level is stable at 200”.
- Both Recirc pumps have been secured.
- The “B” Recirc Pump Discharge Bypass valve is open to keep that loop warm.
- “B” Recirc Loop suction temperature is 180°F and stable.
- The RPV wall temperature is 180°F and stable.
- “B” RHR pump is running.
- “B” RHRSW pump is running.
- Many outage activities, including Control Room panel modifications, are in progress.

While in this condition, the Drywell Health Physics Technician calls the control room to report that wisps of steam have started coming from the Drywell sump area and that it is starting to get very humid in the Drywell.

Control Room operators begin to investigate this report.

Which of the following malfunctions would be consistent with this report and current plant conditions?

Control Room Operators find that...

- a. MO-4602, “B” Recirc Pump Suction valve, somehow got closed.
- b. MO-1905, “B” RHR Inboard Inject Isolation valve, somehow got closed.
- c. MO-1947, “B” RHR HX Service Water Outlet valve, somehow got closed.
- d. MO-1908, Inboard Shutdown Cooling Isolation valve, somehow got closed.

ANSWER: b

Note: Question is based on industry experience in which the SDC discharge valve went closed without operators knowing about it. Recirc pumps secured with RPV level <214 inches means no natural circulation. Coolant temperatures are not reliable indication of coolant temperature without forced circulation. Such a report from the DW is listed as a probable indicator in AOP 149. Stem conditions indicate that there is **no reactor recirculation flow**, either forced or natural.

Distracter 1: The Discharge Valve is normally tagged closed to prevent SDC flow from bypassing the core. Alternately, the Suction valve can have been tagged closed in its place for the same reason. Therefore closing this valve would have no affect of recirculation flow.

Distracter 2: This constitutes a loss of SDC , but not of reactor recirculation flow. If this were the cause, Recirc Pump suction temps and vessel wall temps would be rising due to hotter and hotter forced circulation water.

Distracter 3: This constitutes a loss of SDC but would also trip the running RHR pump.

REFERENCE:AOP-149; OI-149; IG 94-01; SEN 171; ARP 1C03B (A-8)

K/A System: 295021 (Loss of Shutdown Cooling)

K/A Number: AA2.07 (Ability to determine and/or interpret the following as they apply to Loss of Shutdown Cooling: Reactor recirculation flow.)

K/A Value: 2.9/3.1

DAEC Objective: 94.01.01.04 Evaluate plant conditions and control room indications and determine if entry into AOP-149 is warranted. (Loss of S/D Cooling)

Cognitive Level: 2-RI Source:NEW

9. During an ATWS transient, the Shift Supervisor has directed the initiation of Standby Liquid Control System (SBLC).

After placing the SBLC system mode switch to the PUMPS A and B RUN position, you observe the following conditions:

Both SBLC pumps RED lights ON
 Both SBLC Squib valve ready lights OFF
 SBLC Squib continuity loss annunciator ON
 SBLC System discharge pressure is 980 psig
 SBLC System flow = 55 gpm
 SBLC storage tank level lowering
 Reactor pressure is 950 psig
 RWCU isolated
 Reactor power lowering

Evaluate these conditions and indicate if the SBLC system has initiated properly and if not, then specify the discrepancy.

- The SBLC system has initiated properly.
- The SBLC system has NOT initiated properly because system flow would be greater than 56 gpm.
- The SBLC system has NOT initiated properly because the Squib valve continuity loss annunciator would not be activated.
- The SBLC system has NOT initiated properly because the system discharge pressure would be at least 100 psig greater than reactor pressure.

ANSWER: a

Distracter 1: Per OI-153, SBLC has initiated properly, system flow should be > 52.4 gpm. Actual pump flow during testing is closer to 28 gpm.

Distracter 2: Per OI-153, SBLC has initiated properly, continuity annunciator should be activated.

Distracter 3: Per OI-153, SBLC has initiated properly, system pressure should be greater than reactor pressure, however there is no minimum amount specified.

REFERENCE: OI-153

K/A System: 211000 (Standby Liquid Control System)

K/A Number: K4.08 (Knowledge of Standby Liquid Control System design feature(s) and/or interlocks which provide for the following: SYSTEM INITIATION UPON OPERATION of SBLC SWITCH.)

K/A Value: 4.2/4.2

DAEC Objective: 6.00.00.05 Describe how the Standby Liquid Control System RESPONDS TO AN INITIATION signal.

Cognitive Level: 1 I

Source: New Question

10. A small line break LOCA has occurred while at power.

The following plant conditions exist:

HPCI and RCIC will NOT function.

Feedwater is maintaining RPV level slightly greater than +15"

RPV pressure is at 800 psig

Drywell and Torus Sprays have been initiated and are effective

Torus water level has reached 13.5 ft. even with the maximum amount of water being drained to Radwaste from RHR.

Which of the following statements CORRECTLY explains the required actions?

- a. Continue feedwater injection to assure adequate core cooling and continue Drywell Sprays to maintain Drywell temperature < 280°F.
- b. Continue feedwater injection to assure adequate core cooling and terminate Drywell Sprays because Drywell vacuum relief CANNOT be assured.
- c. Terminate feedwater injection to maintain Torus level below 13.5 ft. and continue Drywell Sprays to maintain Drywell temperature < 280°F.
- d. Terminate feedwater injection to maintain Torus level below 13.5 ft. and terminate Drywell Sprays because Drywell vacuum relief CANNOT be assured.

ANSWER: b

Note: **EOP-2 is provided with Entry Conditions blanked out.**

Distracter 1 & 2: Drywell Sprays are required to be secured at 13.5 ft.

Distracter 3: Feedwater is needed to assure adequate core cooling and should not be secured.

REFERENCE: EOP 2

K/A System: 295029 (High Suppression Pool Water Level)

K/A Number: 2.1.7 (Ability to evaluate plant performance and make operational judgments based on operating characteristics/reactor behavior and instrument interpretation.)

K/A Value: SRO 4.4

Objective: SRO 6.58.01.05 Evaluate plant conditions and control room indications and determine the actions directed by EOP 2.

Cognitive Level: 3 SPR

Source: Exam Bank

11. "A" RPS bus was deenergized while being transferred to the Alternate power supply.

During this transfer, a Loss of Coolant Accident occurred which caused entry into EOP-1 on a High Drywell pressure signal.

Restoration of the "A" RPS bus will be necessary for the performance of which one of the following EOP-1 actions?

"A" RPS power will be necessary to ...

- a. verify that all control rods have fully inserted.
- b. verify that the Group 3A isolation has gone to completion.
- c. override CV-4371A, Defeat 11 Containment N2 Supply Isolation Defeat.
- d. maintain the MSIVs open with Defeat 17, Hi Condenser Backpressure Isolation Defeat.

ANSWER: b

Note: The Group 3A valves listed in AOP-358 lose open/closed indication and cannot be verified.

Distracter 1: Loss of RPS makes the rods insert. RPIS indications are not affected by loss of RPS because they are powered from Uninterruptible AC.

Distracter 2: CV-4371A control and override power is from Div 2 instrument AC.

Distracter 3: A ½ Group 1 would be in affect, but B RPS remains energized as do the DC solenoids on the MSIVs, which will stay open with Defeat 17 if Condenser Backpressure rises.

REFERENCE: EOP-1; AOP-358

K/A System: 212000 (Reactor Protection System)

K/A Number: 2.4.8 (Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom based EOPs.)

K/A Value: SRO 3.7

Objective: SRO 5.11.01.01 Explain how the automatic actions from a loss of RPS effect plant and system status.

Cognitive Level: 2-RI

Source: New Question

12. OI-324 "Standby Diesel Generator System" warns against prolonged operation of the SBDG at LESS THAN 25% LOAD to prevent "engine souping".

Which of the following is a possible consequence of engine souping?

- a. Bearing failure due to oil separation.
- b. Injector failure due to incomplete combustion.
- c. Exhaust system fire due to combustion product buildup.
- d. Engine failure due to water accumulation in the fuel oil.

ANSWER: c

Distracter 1: Plausible but not identified as a consequence.

Distracter 2: Plausible but not identified as a consequence.

Distracter 3: Plausible but not identified as a consequence..

REFERENCE: OI-324 P&L 15

K/A System: 264000 (SBDG)

K/A Number: A4.04 (Ability to manually operate and/or monitor in the control room: MANUAL START, LOADING, AND STOPPING OF SBDG.)

K/A Value: 3.7/3.7

DAEC Objective: 19.01.01.01 (Relate the P&Ls, operating cautions, or procedural notes of OI-324 to any component or SBDG operating status.)

Cognitive Level: 1-D

Source: Bank

13. During a normal plant startup and after verifying SRM/IRM overlaps, the operator at 1C05 starts to withdraw the SRMs.

The operator mistakenly selects the "A" IRM instead of "C" SRM.

Without any other operator actions, what will be the effect on the startup after the "A" IRM is withdrawn?

Assume that the plant responded as expected.

- The reactor startup and heatup can continue with a 1/2 scram on the "A" RPS channel.
- The reactor startup and heatup cannot continue because of an IRM DOWNSCALE rod block.
- The reactor startup and heatup can continue with the IRM DOWNSCALE annunciator activated.
- The reactor startup and heatup cannot continue because of an IRM INOP 1/2 Scram and rod block.

ANSWER: b

Distracter 1: IRM downscale condition will produce a rod out block and prohibit control rod withdrawal.

Distracter 2: IRM downscale condition will produce a rod out block and prohibit control rod withdrawal.

Distracter 3: The IRM is not inoperative but downscale, there will be no 1/2 scram.

REFERENCE: ARP 1C05A, D-3, IRM DOWNSCALE

K/A System: 215003 (Intermediate Range Monitor)

K/A Number: K5.03 (Knowledge of the operational implications of the following concepts as they apply to Intermediate Range Monitor: CHANGING DETECTOR POSITION.)

K/A Value: 3.0/3.1

Objective: 79.00.00.06

Given an IRM System operating mode and various plant conditions, predict how each supported system will be impacted by failures in the IRM System: REACTOR MANUAL CONTROL

Cognitive Level: 3 PEO

Source: New Question

14. PS-4315A, which provides a PRIMARY CONTAINMENT HIGH PRESSURE SIGNAL to the Group 3A logic, has failed AS IS.

Which of the following correctly describes the arrangement of Containment pressure switches in the Group 3 Isolation logic and correctly describes the response of the Group 3A Isolation logic to an ACTUAL Containment high pressure condition with this one switch failed?

- There are two pressure switches, one in each logic channel. The one switch in A logic has failed. Therefore, the Group 3A Isolation WOULD NOT occur.
- There are four pressure switches, two in each logic channel. Both switches in a channel must trip in order for the logic to trip. Therefore, the Group 3A Isolation WOULD NOT occur.
- There are four pressure switches, two in each logic channel. If either switch in a channel trips, the logic will trip. Therefore, the Group 3A Isolation WOULD occur.
- There are four pressure switches, four (shared) in each logic channel. If any two switches in a channel trip, the logic will trip. Therefore, the Group 3A Isolation WOULD occur.

ANSWER: c

Distracter 1: Group 3 is four switches, one out of two for each logic.

Distracter 2: Group 3 is four switches, one out of two for each logic.

Distracter 3: Group 3 is four switches, one out of two for each logic. The shared switches describe is similar to Group 1 logic.

REFERENCE: ARP 1C05B, C-8

K/A System: 223002 (PCIS/NSSS)

K/A Number: A2.06 (Ability to predict the impacts of the following on PCIS/NSSS; and based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations; Containment Instrument Failures)

K/A Value: 3.0/3.2

Objective: 42.08.01.07 (List the signals which cause Primary containment and Containment Atmosphere Monitoring and Control isolations. Describe their purpose setpoint and logic. Describe how they are bypassed and how they are reset.)

Cognitive Level: 2-DR

Source: NEW

15. Do the following Source Range Monitor (SRM) system components REMAIN ENERGIZED or do they become DEENERGIZED by a COMPLETE LOSS of 24 VDC System 1?
- 1) "A" SRM detector auxiliary trip units
 - 2) "A" SRM detector drive motor power
- a. 1) REMAINS ENERGIZED
2) REMAINS ENERGIZED
 - b. 1) DEENERGIZED
2) REMAINS ENERGIZED
 - c. 1) REMAINS ENERGIZED
2) DEENERGIZED
 - d. 1) DEENERGIZED
2) DEENERGIZED

ANSWER: b

Distracter 1: Aux trip units are 24VDC.

Distracter 2: Aux trip units are 24VDC. A SRM detector drive motor power is from essential lighting panel 1L80.

Distracter 3: A SRM detector drive motor power is from essential lighting panel 1L80.

REFERENCE: SD 878.1; APO 375

K/A System: 215004 (Source Range Monitor)

K/A Number: K6.02 (Knowledge of the effect that a loss or malfunction of the following will have on the Source Range Monitor System: 24/48 VDC)

K/A Value: 3.1/3.3

Objective: 78.06.01.05 Given an SRM system operating mode and various plant conditions, predict how the SRM system will be impacted by failures in the following support systems: c. DC electrical system.

Cognitive Level: 1-F

Source: New Question

16. The plant is operating at 95% power.

“E” APRM is bypassed.

An LPRM associated with “E” APRM fails UPSCALE.

Which of the following CORRECTLY describes the affect of this failure on the value of Core Thermal Power (MWTH) on the 3D Monicore official case?

- a. LPRMs and APRMs are NOT factors in the heat balance calculation. Therefore, there would be NO CHANGE to the official case MWTH.
- b. LPRMs and APRMs are factors in the heat balance calculation. There would be NO CHANGE to the official case MWTH because “E” APRM is bypassed.
- c. LPRMs are a factor in the heat balance calculation. Therefore, the official case MWTH would INCREASE.
- d. APRMs are a factor in the heat balance calculation even when bypassed. The official case MWTH would INCREASE because the upscale LPRM would cause a higher reading on the “E” APRM.

ANSWER: a

Note: Core Thermal Power is derived from a heat balance and is used to assign the value of reactor power to the APRMs. MWTH will not change.

Distracter 1: No change is correct but NIs are not a factor.

Distracter 2: MWTH will not change. NIs are not a factor.

Distracter 3: MWTH will not change. NIs are not a factor.

REFERENCE: SD 878.3

K/A System: 215005 (Average Power Range Monitor/Local Power Range Monitor)

K/A Number: K3.08 (Knowledge of the effect of a loss or malfunction of the APRM/LPRM will have on the following: CORE THERMAL CALCULATIONS.)

K/A Value: 3.0/3.4

Objective: 81.01.01.15 Given any APRM System operating mode and various plant conditions, predict how any APRM System operation or failure will impact each of the following supported systems: PLANT PROCESS COMPUTER.

Cognitive Level: 2 RI

Source: New Question

17. With the plant at 100% power and NO inoperable equipment or LCOs, the following annunciators are received:

1C05A, A-2, "A" RPS AUTO SCRAM

1C05A, A-5, NEUTRON MONITORING SYSTEM TRIP

1C05A, B-2, APRM A, C, OR E UPSCALE TRIP OR INOP

1C05A, D-2, APRM DOWNSCALE

1C05B, A-6, ROD OUT BLOCK

Investigation reveals that the "C" APRM has just become INOPERABLE.

Which of the following describes the appropriate actions per the ARPs?

- Manually insert a full scram.
- Place "C" APRM mode switch in STANDBY.
- Insert a backup manual half scram on the "A" RPS channel.
- With permission from the OSS, bypass "C" APRM and reset the ½ scram.

ANSWER: d

Distracter 1: Conditions have not degraded to the point that a full scram appropriate. Per Technical Specifications, only two channels are required per trip system. "A" and "E" are still operable. A scram is not required.

Distracter 2: Per Technical Specifications, only two channels are required per trip system. "A" and "E" are still operable. APRM mode switch out of operate would not accomplish anything.

Distracter 3: A backup manual scram is directed per the Scram IPOI-5 but not the ARPs. This action would be useless because A RPS is already tripped.. Per Technical Specifications, only two channels are required per trip system. "A" and "E" are still operable. The trip system is not required to be in the tripped condition.

REFERENCE: Technical Specifications, Section 3.3.1.1; ARP 1C05A (A-2) & (B-2); IPOI-5; OI-878.4

K/A System: 215005 (Average Power Range Monitor/Local Power Range Monitor)

K/A Number: K6.04 (Knowledge of the effect that a loss or malfunction of the following will have on the APRM/LPRM: TRIP UNITS.)

K/A Value: 3.1/3.2

Objective: 81.01.01.09

Describe the function and operation of the following principle LPRM/APRM system components: APRM FLOW-BIASED and NON-FLOW-BIASED TRIP CIRCUITS.

Cognitive Level: 1P

Source: New Question

18. Which of the following correctly identifies the Control Room panel(s) where a reactor water level indicator and/or recorder in the range of:

+8" to +218"

can be read?

- a. 1C05 only
- b. 1C05 and 1C03
- c. 1C05 and 1C04
- d. 1C05 and 1C09

ANSWER: a

Distracter 1: +8" to +218" is a Yarway on 1C05 only. 1C03 also has a Yarway but it measure fuel zone,

-153-218. It is a possible misconception that the 1C03 RPV level recorder has a range of +8" to +218", but it records fuel zone range.

Distracter 2: +8" to +218" is considered "wide range" Yarway. The 1C04 level indication has a wide range of 300 inches, +158-+458.

Distracter 3: 1C09 has several Containment Accident recorders, but no RPV level recorders.

REFERENCE: M-115 ; SD 880

K/A System: 216000 (Nuclear Boiler Instrumentation)

K/A Number: A1.03 (Ability to predict and/or monitor changes in parameters associated with operating the Nuclear Boiler Instrumentation controls including: SURVEILLANCE TESTING.)

K/A Value: 2.9/3.2

Objective: 88.00.00.02 Describe the operation of the following Non-Nuclear Instrumentation System components including range, control room location, calibration condition, any compensation and any instruments that share the same sensing lines: LEVEL, PRESSURE, TEMPERATURE, FLOW.

Cognitive Level: 1 S

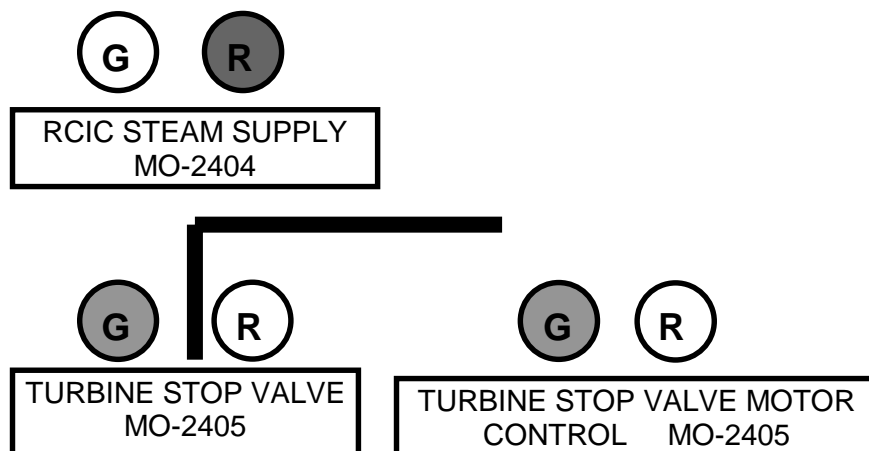
Source: NEW

19. The following question is related to the three sets of RCIC indicating lights shown below, minus the associated handswitches.

GRAY SHADED means the light is ILLUMINATED (energized).

A loss-of-coolant accident has occurred resulting RPV water level reaching 110 inches before the trend was reversed. A transient has occurred involving the RCIC system. The only operator action taken with RCIC was to cycle the handswitch for MO-2405, RCIC Turbine Stop Valve, to the fully CLOSED position and then to hold it in the OPEN position for three seconds. MO-2400 and MO-2401, steam supply isolation valves, are open.

What is the status of RCIC based on these indications?



- A RCIC Auto Isolation trip has occurred. The RCIC Turbine trip is RESET.
- A RCIC High RPV Level trip has occurred. The RCIC Turbine trip is RESET.
- A RCIC Electrical Overspeed trip has occurred. The RCIC Turbine trip is NOT RESET.
- A RCIC Mechanical Overspeed trip has occurred. The RCIC Turbine trip is NOT RESET.

ANSWER: d

Distracters: a., b, and c. are incorrect because MO-2404 OPEN indicates that a 211" trip has NOT occurred and MO-2405 is indicating that a mechanical overspeed trip has occurred, and the valve motor operator indications indicate that the trip cannot be reset from the control room.

REFERENCE: ARPs 1C04C, A-5 and A-6

K/A System: 217000 (Reactor Core Isolation Cooling System)

K/A Number: A2.02 (Ability to (a) predict the impacts of the following on the Reactor Core Isolation Cooling System (RCIC) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: TURBINE TRIPS.)

K/A Value: 3.8/3.7

Objective: 3.02.01.05 Evaluate plant conditions and control room indications to determine if the RCIC System is operating as expected, and identify any actions necessary to place the RCIC System in the correct lineup. Cognitive Level:2-DR Source: Modified , Exam Bank

20. Assume that the plant systems were in the normal lineup for the power level specified in each answer option.

Which of the following events would result in the OSS directing BOTH:

The Immediate Actions of IPOI-5 "Reactor Scram"
and
the IPOI-5 Follow-up Actions to mitigate thermal stratification?

- MSIV closure at 15% power.
- Loss of both RPS busses at 100% power.
- A Main Generator lockout at 25% power.
- RPV low water level trip due to a controller failure at 50% power.

ANSWER: c

Note: Correct answer trips the main turbine but is not a direct reactor scram when <30%. Above 22.5% (BPV capacity) this transient will also cause pressure control problems which will result in a scram. It also results in an open circuit transfer of the non essential busses resulting in a loss of Condensate, Feed, Circ Water, and Recirc Pumps.

Distracter 1: Plausible because this transient causes a pressure transient on the RPV. If the pressure reached 1140 psig, the recirc Pumps would trip. At this low power, the reactor would scram at MSIVs <90% open and the pressure transient would be minimal

Distracter 2: Plausible because RPS powers isolation logics which could affect Recirc Pumps.

Distracter 3: Plausible because low RPV level transients affect the Recirc Pumps and low water level could be causing stratification.

REFERENCE: IPOI 5

K/A System: 295006 (Reactor Scram)

K/A Number: AA2.06 .Ability to determine and/or interpret the following as they apply to a SCRAM: Cause of reactor scram.

K/A Value: SRO 3.8

Objective: SRO 4.22.01 Direct operator performance of IPOI-5 actions to mitigate thermal stratification.

Cognitive Level: 3-SPK

Source: New Question

21. An accident has occurred and the ADS LOW WATER LEVEL CONFIRMED annunciator has actuated.

In which of the following sets of conditions would the actuation of annunciator ADS A/B 2 MIN TIMER(S) INITIATED at 1C03 be expected?

- a. RPV level at +50", RHR pump running with a discharge pressure of 125 psig.
- b. RPV level at +115", RHR pump running with a discharge pressure of 135 psig.
- c. RPV level at +50", Core Spray pump running with a discharge pressure of 115 psig.
- d. RPV level at +115", Core Spray pump running with a discharge pressure of 145 psig.

ANSWER: a

Distracter 1, 2, 3: ADS timers are actuated at 64" decreasing with a confirmatory level of 170" and either an RHR pump running with discharge pressure > 125 psig or a Core Spray pump running with discharge pressure > 145 psig.

REFERENCE: ARP 1C03A A-5

K/A System: 218000 (Automatic Depressurization System)

K/A Number: A3.07 (Ability to monitor automatic operations of the Automatic Depressurization System including: LIGHTS and ALARMS.)

K/A Value: 3.7/3.6

Objective: 8.03.01.03

Evaluate plant conditions and control room indications to determine if the ADS System or the Low-Low Set System is operating as expected, and identify any actions that may be necessary to place the ADS/LLS Systems in the correct lineup.

Cognitive Level: 1 I

Source: Exam Bank

22. Which of the following sets of 480 VAC busses supplies power to the Drywell Cooling Fans?

- a. 1B32 / 1B42
- b. 1B33 / 1B45
- c. 1B34 / 1B44
- d. 1B35 / 1B43

ANSWER: d

Distracter 1: Homogeneous distracter, busses supply essential 480vac loads in Rx Bldg. Operator should know that these busses are in the switchgear room and not in Rx Bldg.

Distracter 2: Homogeneous distracter, busses supply essential 480vac loads in Rx Bldg. Operator should know that 1B33&45 are in the Turbine Bldg.

Distracter 3: Homogeneous distracter, busses supply essential 480vac loads in Rx Bldg.

REFERENCE: OI-760

K/A System: 223001 (Primary Containment System and Auxiliaries)

K/A Number: K2.09 (Knowledge of the electrical power supplies to the following: DRYWELL COOLING FANS.)

K/A Value: 2.7/2.9

Objective: 68.01.01.08

Given a Primary Containment Ventilation System operating mode and various plant conditions, predict how the Primary Containment Ventilation System will be impacted by failures in the following support systems: AC ELECTRICAL DISTRIBUTION.

Cognitive Level: 1-F

Source: NEW

23. Following a reactor scram and Group 1 isolation, reactor pressure is noted to be 1070 psig and increasing. PSV-4405 is manually opened to reduce pressure. The operator observes the amber light above HS-4405 at 1C03 come ON.

Which of the following describes the immediate response of the Low-Low Set valves PSV-4401 and PSV-4407?

- a. Both PSV-4401 and PSV-4407 will open.
- b. Both PSV-4401 and PSV-4407 will remain closed.
- c. PSV-4401 will open and PSV-4407 will remain closed.
- d. PSV-4401 will remain closed and PSV-4407 will open.

ANSWER: a

Distracter 1, 2, 3: Low-Low Set is armed with a High Pressure scram signal (1055 psig) and one relief valve open (25 psig tail pipe pressure) and then both PSV-4401 and PSV-4407 open.

REFERENCE: 1C03A, D-5

K/A System: 239002 (Relief/Safety Valves)

K/A Number: K5.01 (Knowledge of the operational implications of the following concepts as they apply to Relief/Safety Valves: RELIEF FUNCTION of SRV OPERATION.)

K/A Value: 3.4/3.5

Objective: 8.00.00.03 AND 8.03.01.04

State the purpose(s) of the Low-Low Set System. AND List the signals which cause a Low-Low Set auto initiation including setpoints and logic. Describe how they are bypassed and how they are reset.

Cognitive Level: 1 I

Source: Exam Bank

24. The operating crew was forced to rapidly abandon the Control Room and activate the Remote Shutdown Panel.

One operator reports to you, the OSS, that he depressed both manual scram pushbuttons and saw that the 8 white SCRAM GROUP indicating lights were OFF as he hurriedly abandoned the Control Room.

Which of the following is CORRECT concerning VERIFICATION of the scram in accordance with AOP-915, "Shutdown Outside Control Room"?

- a. Further verification is NOT necessary if the manual scram pushbuttons were used to scram the reactor.
- b. Further verification is NOT necessary if the 8 white SCRAM GROUP indicating lights were confirmed OFF.
- c. Further verification is necessary and performed by confirming that the scram air header pressure is 0 psig.
- d. Further verification is necessary and performed by confirming that all 89 pairs of scram inlet and outlet valves are open.

ANSWER: d

REFERENCE: AOP 915 "Shutdown Outside the Control Room"

Distracter 1&2: Very good signs that reactor scrammed but verification is still required by AOP 915, Step 10 Tab 3

Distracter 3: All rods should be in if this indicates 0 psig, but it is not the parameter checked.

K/A System: 295016 (Control Room Abandonment)

K/A Number: Generic 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including: 1 Reactivity Control

K/A Value: SRO 4.3

Objective: 5.30.01 Direct performance of the verification of reactor scram

Cognitive Level: 1-P

Source: New Question

25. The plant is operating at about 55% load when the Stator Cooling Water TCV fails, bypassing the heat exchanger.

As this event progresses, which statement below describes automatic actions the operator should expect to observe?

- a. Turbine Load Set will ramp down, causing the bypass valves to open to control pressure. If, during this time, NO operator action is taken the reactor will scram on high pressure.
- b. The bypass valves receive a direct open signal, causing turbine control valves to close to control pressure. If, during this time, NO operator action is taken the reactor will scram on high pressure.
- c. Turbine Load Set will ramp down, causing the bypass valves to open to control pressure. If, during this time, NO operator action is taken the turbine will trip and the Turbine Stop Valve closure will scram the reactor.
- d. The bypass valves receive a direct open signal, causing turbine control valves to close to control pressure. If, during this time, NO operator action is taken the turbine will trip and the Turbine Stop Valve closure will scram the reactor.

ANSWER: a

Distractor 1: Load Set runs down to cause a runback.

Distractor 2: The reactor will scram on high pressure because bypass valves are sized too small to accept that much steam flow.

Distractor 3: Load Set runs down to cause a runback. The reactor will scram on high pressure because bypass valves are sized too small to accept that much steam flow.

REFERENCE: ARP 1C08C D-4, revision 7; ARP 1C83A A-4, revision 8

K/A System: 241000 (Reactor/Turbine Pressure Regulating System)

K/A Number: K1.11 (Knowledge of the physical connections and/or cause/effect relationships between Reactor/Turbine Pressure Regulating System and the following RPS.)

K/A Value: 3.7/3.8

Objective: 52.01.01.01

Relate the Precautions and Limitations, operating cautions, warnings or procedural notes of OI-693.2 and any related ARPs to any component or EHC System operating status.

Cognitive Level: 2-RI

Source: Exam Bank

26. A Loss of Drywell cooling has occurred that has resulted in Torus and Drywell pressures of 4 psig.

Which of the following is correct concerning the initiation of Torus Sprays in this situation?

Initiation of Torus Sprays is...

- a. NOT ALLOWED by EOP-2. Torus Sprays are used to scrub the air space of radioactive particles in preparation for containment venting and are therefore initiated only after a LOCA.
- b. NOT ALLOWED by EOP-2. Torus Sprays are used to condense steam in the Torus' enclosed atmosphere thus reducing its pressure and are therefore initiated only after a LOCA.
- c. ALLOWED by EOP-2. Torus Sprays are used for evaporative and convective cooling of the Torus' enclosed atmosphere thus reducing its pressure.
- d. ALLOWED by EOP-2. Torus Sprays are used to improve the distribution of water returning from the RHR heat exchangers thus helping reduce Torus Average Water temperature.

ANSWER: c

Distractor #1: Directed by EOP-2 Steps PC/P 3 & 4 no matter what the cause of DW High Pressure. Scrubbing does help prior to venting, but it is not the basis for this action.

Distractor #2: Directed by EOP-2 Steps PC/P 3 & 4 no matter what the cause of DW High Pressure. Steam condensation is the major reason Torus pressure drops when spraying after a LOCA. Also, Drywell Sprays are allowed on in the allowable region of graph 7, i.e.: post LOCA.

Distractor #3: "Allowed" is correct but the reason given is not the correct basis. If anything, the water will pick up more heat in the air space and Torus water temp will increase not decrease.

REFERENCE: EOP Bases document.

K/A System: 230000 (RHR/LPCI, Torus /Pool Spray mode.)

K/A Number: A1.01 (Ability to predict and/or monitor changes in parameters associated with operating the RHR Torus spray mode controls including: Suppression chamber pressure.)

K/A Value: 3,8/3.9

Objective: 2.01.01.07 (Given an RHR system operating mode and various plant conditions, predict how each supported system will be impacted by the following RHR system operations/failures:

c. Containment Spray initiation.)

Cognitive Level: 1-P&B

Source: NEW

27. OI-644 "Condensate and Feedwater Systems" directs that "D" Well Water Pump, 1P-58D, should be removed from service prior to starting which of the following?
- a. "A" Condensate Pump
 - b. "B" Condensate Pump
 - c. "A" Feedwater Pump
 - d. "B" Feedwater Pump

ANSWER: d

Distracter 1, 2, 3: Per OI-644 P&L # 12, the reason is to minimize the voltage transient on 1A2.

REFERENCE: OI-644, Condensate and Feedwater Systems, Precaution and Limitation # 12, page 6

K/A System: 259001 (Reactor Feedwater System)

K/A Number: K2.01 (Knowledge of electrical power supplies to the following: REACTOR FEEDWATER PUMPS.)

K/A Value: 3.3/3.3

Objective: 45.00.00.03

Given a Feed and Condensate System operating mode and various plant conditions, predict how the Feed and Condensate System will be impacted by failures in the following support systems: AC ELECTRICAL DISTRIBUTION.

Cognitive Level: 1 P

Source: New Question

28. The “B” SBGT EXHAUST FAN 1V-EF-15B handswitch is in NORM.

In preparation for operating SBGT train “B” in manual, the “B” SBGT MODE SELECT switch is placed in MANUAL.

While the Mode Switch is still in MANUAL, a full GROUP III initiation signal occurs.

Which of the following describes the response of the “B” SBGT system?

- a. The “B” SBGT lockout relay will trip.
The “B” SBGT train will function normally.
- b. The “B” SBGT lockout relay will NOT trip.
The “B” SBGT train Exhaust Fan operation will be inhibited. (Will not auto start).
- c. The “B” SBGT lockout relay will trip.
The “B” SBGT train Exhaust Fan operation will be inhibited. (Will not auto start).
- d. The “B” SBGT lockout relay will trip.
The “B” SBGT train Exhaust Fan will auto start when/if the “A” SBGT train flow decreases to <3300 SCFM.

ANSWER: c

Distractor 1: “B” train auto start is inhibited

Distractor 2: “B” lockout relay will trip

Distractor 3: “B” train auto start on low flow is inhibited

REFERENCE: BECH E113 SHT11

K/A System: 261000 (Standby Gas Treatment System)

K/A Number: A3.02 (Ability to monitor automatic operations of the Standby Gas Treatment System including: FAN START)

K/A Value: 3.2/3.1

Objective: 7.02.01.03

Evaluate plant conditions and control room indications to determine if the SBGT System is operating as expected, and identify any actions that may be necessary to place the SBGT System in the correct lineup.

Cognitive Level: 1 I

Source: Exam Bank

29. The Narrow Range GEMAC level transmitters (LT-4559, 4560, and 4561) are used in the Reactor Water Level Control system.

1) Are these transmitters calibrated HOT or COLD?
and

2) What type of compensation, if any, do they use?

- a. 1) HOT
2) None
- b. 1) HOT
2) Temperature compensation
- c. 1) COLD
2) None
- d. 1) COLD
2) Electronic pressure compensation

ANSWER: a

Distracter 1: RPV level control Gemacs are not temperature compensated. This describes Wide range Yarways.

Distracter 2: RPV level control Gemacs are calibrated cold. This describes the Floodup Gemacs.

Distracter 3: RPV level control Gemacs are not calibrated cold. and are not pressure compensated. This describes Fuel zone indicators.

REFERENCE: SD-880

K/A System: 259002 (Reactor water level control)

K/A Number: K5.03 (Knowledge of the operational implications of the following concepts as they apply to Reactor water level control system: Water level measurement)

K/A Value: 3.1/3.2

Objective: 88.00.00.02 (Describe the operation of the following non-nuclear instrument system components including range, control room location, calibration condition, any compensation and any instruments that share the same lines: 1 Level)

Cognitive Level: 1-F

Source: NEW

30. The reactor plant is in a coast down condition with all control rods fully withdrawn.

1C05A, E-6 CRD DRIVE MECHANISM HI TEMP annunciator alarms.

An operator reports that the temperature reading for CRDM 22-23 at 1C20 is 255°F and slowly rising.

The System Engineer for CRD has been notified.

In accordance with the ARP, which of the following would be the correct operator action(s) for this condition?

- a. Exercise the Control Rod in an attempt to cool it.
- b. Fully insert the Control Rod and electrically disarm it.
- c. Insert the Control Rod to position 46 to remove it from its backseat.
- d. Leave the Control Rod at position 48 and continue to monitor its temperature.

ANSWER: c

Distracter 1: Per CAUTION on 1C05A, E-6 page 1 "Do not attempt to cool CRD by exercising the affected Control Rod".

Distracter 2: Full insertion of the control rod and electrically disarming is not in accordance with the ARP.

Distracter 3: The ARP directs insertion to 46 if the control rod is backseated.

REFERENCE: ARP 1C05A, E-6

K/A System: 201003 (Control Rod and Drive Mechanism)

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

K/A Value: SRO 3.7

Objective: SRO 1.21.01 Evaluate the event or accident to determine its cause and develop mitigation strategies.

Cognitive Level: 1 P

Source: New Question

31. ATWS EOP has been entered.

The SBLC System has failed.

The NSPEO in the Reactor Building has been directed to perform SEP 304, Boron Injection Using RWCU.

Shortly after commencing injection of the first demineralizer of sodium pentaborate, the NSPEO reports that the ΔP of the demineralizer is 15 psig rising rapidly at a rate of 1 psig/minute.

What action, if any, is directed by SEP 304 to address this situation?

- a. None, this is an expected indication.
- b. Open the CLEANUP DEMIN BYPASS valve, MO-2723.
- c. Lower system flow by lowering the running RWCU pump, 1P-205A/B, speed.
- d. Throttle RBCCW flow to the Non-Regenerative Heat Exchanger set, 1E-215A/B.

ANSWER: d

Distracter 1: This is not an expected indication but is an identified possible indication.

Distracter 2: This action is not an action directed by the SEP.

Distracter 3: This action is not an action directed by the SEP.

REFERENCE: SEP 304 Boron Injection Using RWCU.

K/A System: 204000 (Reactor Water Cleanup System)

K/A Number: 2.4.35 (Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.)

K/A Value: SRO 3.5

Objective: SRO 6.36.01

Direct operator actions to inject boron into the RPV using SEP 304.

Objective: 11.01.01.03

Identify the appropriate procedures that govern the RWCU System operation, include operator responsibilities during all modes of operation, and any actions required by personnel outside of the control room.

Objective: NSPEO 47.03.01.04

Explain the procedure, including any notes or cautions, for Alternate Boron Injection with RWCU.

Cognitive Level: 3-SPK

Source: New Question

32. Reg. Guide 1.97 requires the DAEC to have RADIATION MONITORS installed specifically for Post Accident Monitoring conditions.

On which of the following Control Room panels is that equipment installed or displayed?

- a. 1C09, "Containment Monitoring" panel
- b. 1C10, "Process Rad Monitoring" panel (with 1C02 recorders)
- c. 1C29, "Instrument XfV and Sampling" panel
- d. 1C36, "SRM and IRM" panel (with 1C02 recorders)

ANSWER: a

Note: T.S. Lists only the DW and Torus high range monitors on 1C09. The TRM calls the KAMAN extended range monitors for the Rx Bldg. Turbine Bldg and Offgas stack PAM instruments, but these monitors are in-plant and alarmed at 1C35, which is not an answer option.

Distracter 1: Sounds logical, but there are no accident monitors (1.97) on this Panel.

Distracter 2: Containment Atmosphere Rad Recorders are on this panel, but they are not accident monitors (1.97).

Distracter 3: Main Steam Line and Refuel Exhaust Rad Monitors are on this panel, but they are not accident monitors (1.97).

REFERENCE: SD-877; T.S. 3.3.3.1; TRM T3.3.3

K/A System: 272000 (Radiation Monitoring)

K/A Number: 2.4.3 (Ability to identify Post Accident instruments.)

K/A Value: 3.5/3.8

Objective: 77.00.00.01 (State the purpose of the following: a. PASS, b. Hi-Range containment radiation monitors.

Cognitive Level: 1-S

Source: NEW

33. A reactor startup is in progress.

The Rod Worth Minimizer (RWM) is in OPERATE.

There are four (4) partially withdrawn rods with substitute positions already entered into the RWM.

When rod 30-31 is moved from position 46 to position 48, the FULL OUT light comes ON but the 48 position for this rod on the 4-Rod display goes BLANK. This is accompanied by a ROD DRIFT annunciator.

There is NO OVERTRAVEL OUT Annunciator.

Which of the following CORRECTLY describes the affect, if any, of this Rod Position Information System (RPIS) failure on the Rod Worth Minimizer?

- a. There will be NO AFFECT on the RWM.
- b. The RWM will enforce a SELECT BLOCK.
- c. The RWM will enforce INSERT and WITHDRAW BLOCKS.
- d. There will be NO INSERT, WITHDRAW, or SELECT BLOCKS, but the RWM will provide the message INVALID ROD 30-31 POS, MAX SUBS ALREADY MADE.

ANSWER: c

Distracter 1: The RWM will enforce INSERT and WITHDRAW BLOCKS. RWM gets its rod position indications from 00-48 reed switches.

Distracter 2: The RWM will enforce INSERT and WITHDRAW BLOCKS, not select blocks.

Distracter 3: The RWM will enforce INSERT and WITHDRAW BLOCKS. This message is for when 8 positions are substituted, not 4.

REFERENCE: AOP 357, Rev. 23; SD 878.8, Rev. 3; SD 856.1, Rev. 2; OI 856.3, Rev. 7

K/A System: 214000 (Rod Position Information System)

K/A Number: K3.01 (Knowledge of the effect that a loss or malfunction of the Rod Position Information System will have on the following: RWM.)

K/A Value: 3.0/3.2

Objective: 84.00.00.05

Given a Rod Worth Minimizer System operating mode and various plant conditions, predict how the Rod Worth Minimizer System will be impacted by failures in the following support systems: RPIS.

Cognitive Level: 2-RI

Source: NEW

34. When placing the "B" Loop of RHR in the Torus Cooling Mode, the OUTBD TORUS CLG/SPRAY valve, MO-1932, and the TORUS COOLING/TEST valve, MO-1934, must be opened.

The loss of which of the following busses will prevent operation of these RHR system MOVs?

- a. 1B34
- b. 1B44
- c. 1B34A/1B44A
- d. 1B37

ANSWER: b

Note: Both MOVs are powered from 1B44.

Distracter 1: Selected if candidate identifies A loop valves with the same function.

Distracter 2& 3: Selected if candidate thinks these valves are important enough to be powered from the swing bus. 1B37 comes from the swing bus.

REFERENCE: OI-149 RHR

K/A System: 219000 (RHR/LPCI Torus/Suppression Pool Cooling Mode)

K/A Number: K2.01 (Knowledge of electrical power supplies for the following: VALVES)

K/A Value: 2.5/2.9

Objective: 2.01.01.06

Given an RHR System operating mode and various plant conditions, predict how the RHR System will be impacted by operation, or failure of the following support system(s): ESSENTIAL 4160/480 VAC ELECTRICAL POWER SUPPLIES.

Cognitive Level: 1-F

Source: New Question

35. A Loss of Coolant Accident has occurred and operators are performing EOP-1 and EOP-2.

- Radiological conditions in the plant indicate fuel damage.
- RPV level is currently being maintained +170" to +211".
- The 1C03 operator has been directed to place the "B" Loop of RHR in Shutdown Cooling per SEP 306, "Initiation of Shutdown Cooling for EOP Use".

The 1C03 operator gets to the step for opening the breaker for MO-1935, MIN FLOW BYPASS, but radiological conditions in the Reactor Building will make this task dangerous.

Does the OSS have the authority to waive this step?
(HAS AUTHORITY or DOES NOT HAVE AUTHORITY)

If HAS AUTHORITY, identify the applicable caution associated with this decision.
If DOES NOT HAVE AUTHORITY, identify who does have the authority.

- a. HAS AUTHORITY
There will be a loss of decay heat removal capacity with the MIN FLOW BYPASS open in the Shutdown Cooling mode.
- b. HAS AUTHORITY
Shutdown Cooling flow must be established promptly to avoid draining the RPV while the MIN FLOW BYPASS is open.
- c. DOES NOT HAVE AUTHORITY
The Operations Manager has the authority to waive this step.
- d. DOES NOT HAVE AUTHORITY
The Emergency Coordinator has the authority to waive this step.

ANSWER: b

Distracter 1: OSS does have authority but there is no such caution. Also selected if candidate thinks that the Min Flow stays open in the SDC mode.

Distracter 2&3: OSS does have the authority per SEP 306. Ops Mgr. and Emerg Coord are plausible distracters.

REFERENCE: SEP 306 "Initiation of Shutdown Cooling for EOP Use".

K/A System: 205000 (RHR Shutdown Cooling Mode)

K/A Number: 2.4.48 (Ability to interpret control room indications to verify the status and operation of system/and understand how operator actions and directives affect plant and system conditions.

K/A Value: SRO 3.8

Objective: SRO 6.46 Direct crew response for performance of RC/P leg of EOP-1.

SRO 6.46.06 Direct operator actions to initiate Shutdown Cooling using only RHR pumps not required to maintain RPV level >170 inches.

Cognitive Level: 3 SPK

Source: New Question

36. A rupture of the Torus above the water line has occurred during a LOCA.

- The RHR system has responded as designed.
- RPV water level is 170 inches and rising.
- The Drywell pressure is 3 psig and lowering slowly.
- The Torus pressure is 0.5 psig and lowering slowly.

The 1C03 operator has taken both CONTAINMENT SPRAY ENABLE switches to ENABLE.

If that operator were to attempt to initiate Torus and Drywell Sprays at this point, would the valves open?

- a. Torus Spray valves would open.
Drywell Spray valves would open.
- b. Torus Spray valves would NOT open.
Drywell Spray valves would open.
- c. Torus Spray valves would open.
Drywell Spray valves would NOT open.
- d. Torus Spray valves would NOT open.
Drywell Spray valves would NOT open.

ANSWER: a

Distracter 1: Selected if candidate thinks <2 psig isolates Torus Sprays.

Distracter 2: Selected if candidate thinks <2 psig in torus isolates DW Sprays.

Distracter 3: Selected if candidate thinks <2 psig in Torus isolates both Torus & DW Sprays. <2 psig in DW does.

REFERENCE: EOP 2 bases

K/A System: 226001 (RHR/LPCI Containment Spray System Mode)

K/A Number: K6.12 (Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI Containment Spray System Mode: CONTAINMENT INTEGRITY.)

K/A Value: 3.4/3.5

Objective: 2.03.01.04 Describe the RHR system interlocks, including purpose, setpoints, logics, when and how they are bypassed, overridden or reset.

Cognitive Level: 2-RI

Source: New Question

37. The plant is at 100% power and a normal electric plant lineup. "A" and "B" RPS busses are being powered from their respective MG Sets. A switchyard malfunction results in the "J" and "K" Breakers tripping OPEN. Busses 1A3 and 1A4 experience a fast transfer to the Standby Transformer.

After the transient has stabilized, what is the status of the MSIVs?

- a. Inboard and Outboard MSIVs are OPEN.
- b. Inboard and Outboard MSIVs are CLOSED.
- c. Inboard MSIVs are OPEN and Outboard MSIVs are CLOSED.
- d. Inboard MSIVs are CLOSED and Outboard MSIVs are OPEN.

ANSWER: a

Distracters 1, 2, & 3: RPS remains energized and no MSIVs are repositioned

REFERENCE: SD 304 and SD 358

K/A System: 239001 (Main and Reheat Steam System)

K/A Number: K2.01 (Knowledge of electrical power supplies to the following:
MAIN STEAM ISOLATION VALVE SOLENOIDS.)

K/A Value: 3.2/3.3

Objective: 48.01.01.03

Given a Main Steam System operating mode and various plant conditions, predict how the Main Steam System will be impacted by failures in the following support systems: RPS, and 125 VDC PANELS 1D13 and 1D23.

Cognitive Level: 2 RI

Source: Cooper 1 1999 Exam (INPO Bank)

38. The plant is operating at power. A Second Assistant reports there is about 4" of water accumulating on the floor in the SE Corner Room and it appears to be from floor drains backing up.

What is the appropriate course of action?

- a. Enter EOP 1 and scram the reactor.
- b. Enter Emergency Depressurization Contingency and ED.
- c. Begin a reactor shutdown per IPOI 3, 4, or 5 as appropriate.
- d. Enter EOP 3 and operate available sump pumps to maintain water level less than 2".

ANSWER: d

Note **EOP-3 is provided with Entry Conditions and Step SC-3 blocked out.**

Distracter 1: EOP 1 is enter if reduction in reactor pressure would effect the leak rate. Does not apply to this scenario.

Distracter 2: ED would be performed if two areas were above Max Safe and if reduction in reactor pressure would effect the leak rate. Does not apply to this scenario.

Distracter 3: A reactor shutdown per the IPOIs would be performed if two areas were above Max Safe. Does not apply to this scenario.

REFERENCE: EOP 3

K/A System: 295036 (Secondary Containment High Sump/Area Water Level)

K/A Number:2.4.4 (Ability to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal procedures.)

K/A Value: SRO 4.3

Objective: SRO 6.67.01.03

Determine if the EOP 3 entry condition parameter(s) exceed(s) the Table 6 Max Normal or Max Safe limit in one or more areas.

Cognitive Level: 3-SPR

Source: Exam Bank

39. (Assume that all times and values provided are exact.)

The System Operation Center requests that the DAEC lower generator output by 60 MWe.

The operator on the Recirc controls records the following readings as he begins the downpower:

Time Generator Megawatt Output

0120 560 MWe

0121 550 MWe

0122 547 MWe

0123 544 MWe

0124 542 MWe

0125 540 MWe

- 1) Has the operator exceeded the IPOI-3 "Power Operations" limit for STEP CHANGES in reactor power? (Exceeded or NOT exceeded)
- 2) Has the operator exceeded the IPOI-3 limit for OVERALL RATE OF POWER CHANGE? (Exceeded or NOT exceeded)
 - a. 1) Exceeded
2) Exceeded
 - b. 1) Exceeded
2) NOT exceeded
 - c. 1) NOT exceeded
2) Exceeded
 - d. 1) NOT exceeded
2) NOT exceeded

ANSWER: d

Note: First step change was 10 MWe; The limit is 5%, or ≈ 25 Mwe. Overall rate of change was 20 MWe/5 minutes or 4 MWe/Minute; The limit is 1% or 5 MWe/minute. The customary rate of change is 2-3 MWe/Min.

Distracter 1: Selected if candidate thinks Step Change limit is 1% (5 MWe) and Overall rate limit is 2-3 MWe/minute.

Distracter 2: Selected if candidate thinks Step Change limit is 1% (5 MWe).

Distracter 3: Selected if candidate thinks Overall rate limit is 2-3 MWe/minute.

REFERENCE: IPOI 3, Power Operations

K/A System: 245000 (Main Turbine Generator and Auxiliary Systems)

K/A Number: A4.05 (Ability to manually operate and/or monitor in the control room: GENERATOR MEGAWATT OUTPUT.)

K/A Value: 2.7/2.7

Objective: 93.11.01.13 Explain basis for the P&Ls of IPOI-3.

Cognitive Level: 3-SPK

Source: New Question

40. A COMPLETE LOSS Uninterruptible AC Power (1Y23) has occurred while at 100% power. Operators manually scrammed the reactor due to RPV level control problems. RPV level lowered to 140" and is now at 150" and rising slowly. Assume that there are NO EOP-2 entry conditions.

Which of the following EOP-1 Alternate Pressure Control Systems will **NOT** remain available?

- a. Main Steam Line Drains
- b. Main Turbine Bypass Valves
- c. RWCU in Recirculation Mode
- d. LOW- LOW Set Safety Relief Valves

ANSWER: b

Note: Uninterruptible AC Power would not be available to power EHC Logic after the turbine trip therefore, turbine bypass valves cannot be used.

Distracter 1: Would remain available. Selected if candidate thinks a Group 1 Isolation would occur.

Distracter 2: Would remain available. Selected if candidate thinks a Group 5 Isolation would occur.

Distracter 3: Would remain available. Selected if candidate thinks LLS logic is powered from UPS.

REFERENCE: AOP 301, Loss of Essential Power, and AOP 357, Loss of Uninterruptible AC Power.

K/A System: 262002 (Uninterruptible Power Supply)

K/A Number: K3.13 (Knowledge of the effect that a loss or malfunction of the Uninterruptible Power Supply will have on the following: REACTOR PRESSURE.)

K/A Value: 2.7/2.9

Objective: 52.01.01.02

Given an EHC System operating mode and various plant conditions, predict how the EHC System will be impacted by failures in the following support systems: UNINTERRUPTIBLE AC CONTROL POWER SYSTEM.

Cognitive Level: 2 RI

Source: Exam Bank

41. A HIGH STEAM LINE FLOW signal has resulted in a Group 1 Isolation from 100% power. Reports from the Turbine Building confirm that the isolation signal was valid.

The following plant conditions exist:

- Several control rods DID NOT fully insert.
- SBLC has been initiated.
- RPV water level is currently 170" and being intentionally lowered.
- Low-Low Set SRVs are controlling RPV pressure between 1025 and 900 psig.
- The Non Essential busses underwent a closed transfer to the Startup transformer.

Would it be appropriate for the OSS to direct installation of EOP Defeat 15, "MSIV and MSL Drain RX LO-LO-LO Level isolation Defeat"? (APPROPRIATE or NOT APPROPRIATE)

Also, identify the correct reason why it is or is not appropriate.

- a. NOT APPROPRIATE; There is indication of a Steam Line break.
- b. NOT APPROPRIATE; EOP Defeat 15 is installed only if the MSIVs are still open.
- c. APPROPRIATE; The main condenser is available and reopening of the MSIVs/MSL Drains will help stabilize RPV pressure.
- d. APPROPRIATE; The main condenser is available and reopening of the MSIVs/MSL Drains will reduce the challenge to Primary Containment.

ANSWER: a

Note: **ATWS EOP is provided.** OSS must prioritize safety functions. EOP bases is clear that MSIV/MSL Drains should not be reopened with indications of a steam leak.

Distracter 1: Selected if candidate is confused about ATWS Step /2 which says ,if all MSIVs are open install Defeat 15. Defeat 15 purpose statement is to "allow opening" MSIVs with a 3XLO level isolation in effect.

Distracter 2: Not appropriate per ATWS EOP bases. The condenser would be available and reopening MSIVs/MSL Drains would help stabilize RPV pressure.

Distracter 3: Not appropriate per ATWS EOP bases. The condenser would be available and reopening of the MSIVs/MSL Drains will reduce the challenge to Primary Containment.

REFERENCE: ATWS EOP

K/A System: 295025 (High Reactor Pressure)

K/A Number: 2.4.22 (Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.)

K/A Value: SRO 4.0

Objective: SRO 1.21.02 Recognize and prioritize data relevant to the accident or event.

Cognitive Level: 1 B

Source: New Question

42. Which of the following Offgas System design feature(s) function to maximize carbon bed efficiency?
- preheating the offgas with steam prior to the recombiner
 - routing the offgas through the 37 second and 30 minute holdup lines
 - maintaining the carbon bed vaults at 77°F and reheating the offgas prior to the carbon beds
 - filtering the offgas prior to the carbon beds and directing the flow upward through the first three beds

ANSWER: c

Distracter 1: Preheating maximizes the operation of the recombiner

Distracter 2: Routing the offgas through the holdup lines allow the short lived isotopes to decay

Distracter 3: Filtering removes particulates and does not effect efficiency. Directing flow upward enhances draining

REFERENCE: System Description 672, Offgas System

K/A System: 271000 (Offgas System)

K/A Number: K4.07 (Knowledge of OFFGAS SYSTEM design feature(s) and/or interlocks which provide for the following: MAXIMIZING CARBON BED EFFICIENCY.)

K/A Value: 2.6/2.7

Objective: 47.01.01.02

Describe the purpose/operation of the following principle Offgas and Recombiner System components and subsystems: OFFGAS MOISTURE SEPARATORS and ELECTRIC REHEATER.

Cognitive Level: 1 F

Source: New Question

43. A DELUGE fire suppression system has a normally dry supply header with OPEN spray nozzles.

A PREACTION fire suppression system has a normally dry supply header with FUSIBLE LINKS in the spray nozzles.

1) Which type of fire suppression system is used for the Standby Diesel Generators (SBDG) and associated Fuel Oil Day Tank rooms?

and

2) Which type of actuation system releases the priming water pressure from the top of the main valve disc on the Deluge or Preaction system used in the SBDG Rooms?

- a. 1) DELUGE
2) An electronic fire sensor opens a solenoid vent valve to release the pressure.
- b. 1) DELUGE
2) A mechanical Heat Activated Device (HAD) releases the pressure.
- c. 1) PREACTION
2) An electronic fire sensor opens a solenoid vent valve to release the pressure.
- d. 1) PREACTION
2) A mechanical Heat Activated Device (HAD) releases the pressure.

ANSWER: d

Distracter 1: Very similar systems but Preaction is used to prevent inadvertent system operation. The Electronic sensor actuators are used on the Turbine Bearing Preaction system, not the SBDG.

Distracter 2: Very similar systems but Preaction is used to prevent inadvertent system operation.

Distracter 3: The Electronic sensor actuators are used on the Turbine Bearing Preaction system, not the SBDG.

REFERENCE: SD 513

K/A System: 286000 (Fire Protection System)

K/A Number: K1.09 (Knowledge of the physical connections and/or cause effect relationships between Fire Protection System and the following: EMERGENCY GENERATOR ROOMS.)

K/A Value: 3.2/3.3

Objective: NSPEO 9.01.01.02

Describe the flowpaths and interrelationships between the Fire Protection System and other plant systems.

Cognitive Level: 1-F

Source: New Question

44. The plant is shutdown with refueling / fuel movement operations in progress.

An NSPEO in the Reactor Bldg. reports that craft workers have set up a welder on the Second Floor and have run their welding cables through the two doors going into the Recirc MG room.

Which of the following is

- 1) the proper initial response, if any, to this report?
 - 2) the reason for this response?
- a.
 - 1) No response is necessary.
 - 2) These are not Secondary Containment Airlock doors.
 - b.
 - 1) No response is necessary.
 - 2) These are Secondary Containment Airlock doors but they are not required to be operable during Refueling outages.
 - c.
 - 1) Initiate action to close at least one of these doors within 4 hours.
 - 2) These are Secondary Containment Airlock doors that are required to be operable in Modes 1, 2, and 3.
 - d.
 - 1) Suspend movement of irradiated fuel.
 - 2) These are Secondary Containment Airlock doors that are required to be operable during fuel movement.

ANSWER: d

Note: The DAEC will begin RFO 17 shortly after the 4/9/01 ILC exam. Correct answer can be found in Tech Specs and in Refueling Procedure.

Distracter 1: Possible misconception, but doors are Sec Cont airlock doors.

Distracter 2: Sec Cont airlock doors are sometimes disabled during Refuel outages, but are required during fuel movement.

Distracter 3: This is the proper response in modes 1, 2, or 3; but the plant is in mode 5.

REFERENCE: T. S. 3.6.4.1

K/A System: 290001 (Secondary Containment)

K/A Number:A2.01 (Ability to predict the impact of the following on secondary containment; and based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: Personnel airlock failure.)

K/A Value: 3.3/3.7

Objective:98.02.01.02 (Relate the P&Ls, operating cautions or special cautions of RFP 301, ,RFP 402, and RFP 403 to any fuel handling component or evolution status.)

Cognitive Level: 3-SPK

Source: New

45. An accident has occurred which resulted in an offsite release.

The Control Building Intake Rad Monitors, RIM6101A/B were at approximately 2 mR/hr and rising at 1 – 2 mR/hr per minute.

At 0933, RIM6101A exceeded 5 mR/hr.

At 0935, RIM6101B exceeded 5 mR/hr.

The Standby Filter Units (SFU) and Control Bldg. HVAC shifted to the following lineup:

	<u>A SFU</u>	<u>B SFU</u>
Intake Valve, AV7301	OPEN	CLOSED
Heater, EC7304	ON	OFF
Discharge valve, AV7318	OPEN	CLOSED
Fan, 1V-SF-30	ON	OFF
Intake Isolation Dampers, 1V-AD-30A & B	CLOSED	
Exhaust Isolation Dampers, 1V-AD-31A & B	CLOSED	

Based only on the indications provided, are the SFUs operating properly? (NO or YES)

If NO, identify what is wrong.

If YES, identify what conditions if any will cause “B” SFU to start.

- No; the “B” SFU should have automatically started the same as “A” SFU.
- No; the “B” SFU intake and exhaust dampers, 1V-AD-30B & 1V-AD-31B, should be OPEN.
- Yes; the “B” SFU will not automatically start until the “A” SFU flow drops to ≤ 800 scfm.
- Yes; the “B” SFU will not automatically start until the “A” SFU cannot maintain the Control Room at a positive pressure.

ANSWER: c

Note: Initiation takes a lockout >5 mr and <800 scfm. The A SFU would have established flow.

Distracter 1: “B” SFU will go into Standby automatically. A SFU has had 2 minutes to establish >800 scfm flow. This logic is different than SBTG.

Distracter 2: “B” SFU lockout should have tripped, closing the dampers.

Distracter 3: The Battery Exhaust fans shift to keep Control Room DP positive.

REFERENCE: SD 730, OI 730

K/A System: 290003 (Control Room HVAC)

K/A Number: A2.01 (Ability to (a) predict the impacts of the following on the Control Room HVAC and, (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: INITIATION/RECONFIGURATION.

K/A Value: 3.1/3.2

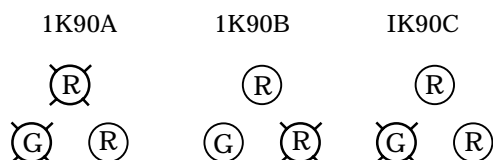
Objective: 65.01.01.05 List the signals which cause a Control Building HVAC System isolation/Standby Filter Unit auto initiation including setpoints and logic. Describe how the Control Building HVAC System responds to a SFU initiation signal.

Cognitive Level: 1 I

Source: Revised, Exam Bank

46. Upon entering the control room, you observe the following indications for the Instrument and Service Air Compressors 1K90A, B, and C.
G is GREEN and R is RED.

Instrument Air header pressure is 100 psig.



Which of the following would explain a situation in which these indications would be present?

- a. 1K90A is running as the Lag compressor; 1K90B has tripped on Motor Overload.
- b. 1K90B is running as the Lead compressor; 1K90C has tripped on Low Oil Pressure.
- c. 1K90C is running as the Lead compressor; 1K90A has tripped on High Oil Temperature.
- d. 1K90B is running as the Lag compressor; 1K90A has tripped on High 2nd Stage Outlet Temperature.

ANSWER: d

Distracter 1, 2, 3: 1K90A is the Lead compressor and has tripped; 1K90B is the Lag compressor and is running; 1K90C is the Lag-Lag compressor and is not running or tripped.

REFERENCE: System Description 518, Instrument and Service Air System and ARP 1C07B, A-9, AIR COMPRESSOR TRIP

K/A System: 300000 (Instrument Air System)

K/A Number: A3.02 (Ability to monitor automatic operations of the Instrument Air System including: AIR TEMPERATURE.)

K/A Value: 2.9/2.7

Objective: 36.00.00.05 OR 36.00.00.06

Evaluate plant conditions and control room indications to determine if the Instrument and Service Air System is operating as expected, and identify any actions that may be necessary to place the Instrument and Service Air System in the correct lineup. OR

Identify the appropriate procedures that govern the Instrument and Service Air System operation, include operator responsibilities during all modes of operation, and any actions required to be performed by personnel outside the control room.

Cognitive Level: 2-DR

Source: New Question

47. A high RPV water level transient has occurred while at power.

1C05A, D-1 REACTOR VESSEL HI/LO LEVEL RECORDER ALARM annunciated.

Which of the following CORRECTLY describes the level at which this ANNUNCIATOR is received and a directed action from the ARP?

- a. 195"; take manual control of any or all feedwater regulating valves.
- b. 211" trip HPCI and RCIC.
- c. 214"; trip the low pressure ECCS pumps.
- d. 258"; close the MSIVs.

ANSWER: a

Note: 1C05A,D-1 annunciator alarms at 195".

Distracter 1:211" is the high level trip of Feedwater Pumps, Main Turbine, HPCI and RCIC.

Distracter 2: 214" is the level at which water is raised in the event of a loss of forced circulation.

Distracter 3: 258" is the level of the Main Steam lines. Tripping of pumps and Closing MSIVs are actions directed based on plant conditions.

REFERENCE: ARP 1C05A, D-1, REACTOR VESSEL HI/LO LEVEL RECORDER ALARM

K/A System: 295008 (RPV High Level)

K/A Number: 2.4.50 (Ability to verify system alarm setpoints and operate controls identified in ARP.)

K/A Value: 3.3/3.3

Objective: 45.01.01.02

Identify the appropriate procedures that govern the Feed and Condensate System operation, include operator responsibilities during all modes of operation, and any actions required to be performed by personnel outside the control room.

Cognitive Level: 1 P & S

Source: New

48. EPIP Form NOTE 5 is provided on the next page. EPIP EAL Tables and Section 3.3 are provided as SRO Exam handouts.

A severe Loss of Coolant accident has occurred.

- The Reactor is shutdown.
- RPV level was offscale low for several minutes before it was recovered.
- Level is currently stable at 0".
- A pair of MSIVs has failed to completely close.

The following radiological conditions exist at the time that the Emergency Action Level is being declared:

- The Turbine Bldg KAMAN monitor reading is 0.5 $\mu\text{Ci/cc}$ and is rising steadily.
- The Reactor Bldg. and Offgas Stack KAMAN monitor readings are elevated but not to the alarm level.
- Radiological field survey results are not yet available.
- The Drywell rad monitors are reading 500 R/hr and rising slowly.
- The Torus rad monitors are reading 20 R/hr. and rising slowly.

Which of the following is CORRECT Protective Action Recommendation concerning EVACUATION and SHELTER?

- a. Evacuation is not necessary at this time.
- b. Evacuate within a 2 mile radius and to 5 miles in the downwind subareas.
- c. Evacuate within a 2 mile radius and to 5 miles in the downwind subareas, unless conditions make evacuation dangerous, and shelter downwind subareas from 5 miles to EPZ edge.
- d. Evacuate within a 2 mile radius, evacuate from 2 miles to the EPZ edge in the downwind subareas, and shelter as appropriate beyond the EPZ edge.

ANSWER: b

Note: Based on Offsite Rad Conditions alone, a Site Area Emergency should be declared with no evacuation. However, a General Emergency should be declared from Fission Barrier Table.

Distracter 1: Selected if General Emergency is NOT identified.

Distracter 2: Selected if General Emergency is identified but severe core damage is criteria is misapplied. Severe core Damage is specified on Table 2 as $>700\text{R/hr}$. Drywell or $>30\text{ R/hr}$. Torus rad levels. Evacuation statement from Table 2 is a paraphrase of the correct answer option.

Distracter 3: Last possible option from Table 1; Homogeneous distracter

REFERENCE: EPIP 3.3; EPIP Form NOTE 5; EAL Tables

K/A System: 295038 (High Offsite Release Rate)

K/A Number: 2.4.44 Knowledge of Emergency Plan Protective Action Recommendations.

K/A Value: SRO 4.0

Objective: SRO 3.01.02.07 Demonstrate the ability to use EPIP 3.3 to determine Protective Action Recommendations

Cognitive Level: 3-SPR Source: NEW

49. Which of the following are possible indications to the control operator that the in service Fuel Pool Cooling pump has tripped?
- Annunciator 1C04B, A-4, FUEL POOL HI/LO LEVEL; lowering Fuel Pool level indicated on LI-3413 at 1C04
 - The Radwaste operator reports an annunciator on Panel 1C136; rising Fuel Pool level indicated on LI-3413 at 1C04
 - SANSOE reports that there is a Low Flow annunciator on Panel 1C136, rising Skimmer Surge Tank level indicated on LI-4312 at 1C04
 - Annunciator 1C04B, D-2, FUEL POOL COOLING PANEL 1C-65/1C-66 TOUBLE; lowering Skimmer Surge Tank level indicated on LI-4312 at 1C04

ANSWER: c

Distracter 1: Normal level in the Fuel Pool is 37 ft. 5 inches with some water going over the weirs. The low level alarms is at 37 ft. 1 inch. Level will lower to the weirs.

Distracter 2: The Radwaste operator will get the alarm but Fuel Pool level will lower slightly to the level of the weirs.

Distracter 3: Skimmer Surge Tank level will increase.

REFERENCE: ARP 1C04B, D-2, FUEL POOL COOLING PANEL 1C-65/1C-66 TOUBLE, OI-435, Fuel Pool Cooling System, M-135, Fuel Pooling Cooling

K/A System: 233000 (Fuel Pool Cooling and Cleanup)

K/A Number: A3.03 (Ability to monitor automatic operations of the Fuel Pool Cooling and Cleanup including: SYSTEM INDICATING LIGHTS AND ALARMS.

K/A Value: 2.6/2.6

Objective: 31.00.00.07

Evaluate plant conditions and control room indications to determine if the Fuel Pool and Fuel Pool Cooling System is operating as expected, and identify any actions necessary to place the Fuel Pool and Fuel Pool Cooling System in the correct lineup.

Cognitive Level: 2-RI

Source: New Question

50. What type of CORE ORIFICING, if any, is used at the Duane Arnold Energy Center?
- Core orificing is NOT used at the DAEC.
 - Core orificing is used at the DAEC.
The SAME size orifice pieces are used throughout the core.
 - Core orificing is used at the DAEC.
The peripheral orifice pieces are SMALLER (tighter) than the ones used on the core interior.
 - Core orificing is used at the DAEC.
The peripheral orifice pieces are LARGER (looser) than the ones used on the core interior.

ANSWER: c

Note: SD states that DEAC has orifices. Generic Fundamentals explains why it is necessary and how it works on a BWR.

Distracter 1, 2, 3: All fuel support pieces have orifice plates. The peripherals are tighter to equalize flow throughout the core. (i.e.: force more flow through the higher powered bundles.)

REFERENCE: System Description 262. Generic Fundamentals Chapter 8, "Thermal Hydraulics"

K/A System: 290002 (Reactor Vessel Internals)

K/A Number: K4.03 (Knowledge of Reactor Vessel Internals design feature(s) and/or interlocks which provide for the following: CORE ORIFICING.)

K/A Value: 3.2/3.3

Objective: 50007.01.09 Define core orificing and explain why it is necessary for a BWR.

Cognitive Level: 2-DR

(The fact that DAEC has core orifices is level 1 F. After that, the reason for the sizing of the orifices is not simple memory; it requires "Understanding".

Source: New Question

51. An ATWS has occurred.

The 1C05 operator has started the second CRD pump and is performing RIP 103.2 "Increase CRD Cooling Flow and Pressure".

- 1) How will CRD cooling flow be increased?
 - 2) How will CRD cooling pressure be increased?
- a.
 - 1) By raising the CRD Flow Controller FC-1814 setpoint to maximum in AUTO.
 - 2) By throttling OPEN MO-1830, DRIVE WATER Δ P CONTROL.
 - b.
 - 1) By raising the CRD Flow Controller FC-1814 setpoint to maximum in AUTO.
 - 2) By throttling CLOSED MO-1830, DRIVE WATER Δ P CONTROL.
 - c.
 - 1) By raising the CRD Flow Controller FC-1814 output to maximum in MANUAL.
 - 2) By throttling OPEN MO-1830, DRIVE WATER Δ P CONTROL.
 - d.
 - 1) By raising the CRD Flow Controller FC-1814 output to maximum in MANUAL.
 - 2) By throttling CLOSED MO-1830, DRIVE WATER Δ P CONTROL.

ANSWER: c

Distracter 1: Controller in AUTO is plausible to free up operator during a busy evolution.

Distracter 2 : Controller in AUTO is plausible to free up operator during a busy evolution. Closing Drive water DP valve is plausible because it raised Drive water pressure to better drive control rods.

Distracter 3: Closing Drive water DP valve is plausible because it raised Drive water pressure to better drive control rods.

REFERENCE: RIP 103.2

K/A System: 295015 (Incomplete scram-Abnormal)

K/A Number: 2.4.11 (Knowledge of Abnormal condition procedures.)

K/A Value: 3.4/3.6

Objective: Task 95.08 Insert control rods by increasing CRD Cooling Flow and Pressure.

Cognitive Level: 1-P

Source: NEW

52. With the plant operating at 25% power, supplying the grid, a generator primary lockout occurs. What changes occur in the plant electrical system and turbine as a result of this event? Assume a normal plant electrical lineup prior to this event.
- turbine trip; no bus transfer; load shed occurs
 - turbine trip; bus 1A1 and 1A2 closed circuit transfer to the startup transformer; no load shed
 - no turbine trip; bus 1A1 and 1A2 closed circuit transfer to the startup transformer; no load shed
 - turbine trip; bus 1A1 and 1A2 open circuit transfer to the startup transformer; non-essential bus load shed occurs

ANSWER: d

Distracter 1: Generator Primary Lockout Relay is designed to protect the Main Generator, initiate a Turbine trip, and initiate an Open Circuit transfer (SD-304).

Distracter 2: Generator Primary Lockout Relay trip will cause an Open Circuit transfer (ARP 1C08C A-1).

Distracter 3: Generator Primary Lockout Relay trip will trip the Main Turbine (ARP 1C07A A-2).

REFERENCE: ARP 1C08C A-1, SD-304 page 12, 18, 19

K/A System: 295005 (Main Generator Trip)

K/A Number: AA1.07 (Ability to operate and/or monitor the following as they apply to Main Generator Trip: AC ELECTRICAL DISTRIBUTION.)

K/A Value: 3.3/3.3

DAEC Objective: 14.00.00.03

Evaluate plant conditions and control room indications to determine if the Non-essential Electrical Distribution is operating as expected, and identify any actions that may be necessary to place the Non-essential Electrical Distribution System in the correct lineup, include in this evaluation both an open and closed transfer.

Cognitive Level: 1 I

Source: Exam Bank, Question # 758

53. GEMAC Feedwater Level Controllers were in normal operation for full power operation when a reactor scram occurred.

Per IPOI-5, "Reactor Scram", the 1C05 operator depressed the pushbutton handswitch for MANUAL LEVEL SETBACK TO 175".

Which of the following CORRECTLY describes the affect of this action on the Feedwater Level Controllers?

- a. The Master Controller remains in AUTO and its setpoint goes to 175".
- b. The Master Controller shifts to MANUAL and its setpoint goes to 175".
- c. The Master Controller is removed from the circuit.
Both "A" and "B" Feed Reg Valves remain in AUTO and their setpoints go to 175".
- d. The Master Controller is removed from the circuit.
Both "A" and "B" Feed Reg Valves shift to MANUAL and their setpoints go to 175".

ANSWER: a

Note: The only time this switch is used is during Feedwater Level control following a reactor scram.

Distracter 1: Plausible because of the name of the pushbutton.

Distracter 2: Plausible because operator may want to control feed reg valves independently after a scram. A & B controllers in AUTO put the master in the control circuitry.

Distracter 3: Plausible because of the name of the pushbutton.

REFERENCE: IPOI 5

K/A System: 295006 (Scram)

K/A Number: AK2.02 (Knowledge of the interrelations between SCRAM and the following:
REACTOR WATER LEVEL CONTROL)

K/A Value: 3.8/3.8

DAEC Objective: 45.05.01.05 Describe the operation of the FWLC circuitry.

Cognitive Level: 1-I

Source: New

54. A loss of coolant accident with concurrent loss of Well Water pumps has occurred while at power. Operators are attempting to restore Well Water and Drywell Cooling.

When the Drywell Average Air temperature cannot be restored and maintained below 280°F, the OSS orders that an Emergency Depressurization be initiated.

One of the reasons for performing Emergency Depressurization at this point is to ensure that Drywell temperatures will remain below structural design limits.

Which of the following is also a basis for this action?

Emergency Depressurization is performed at this point in order to ensure ...

- that indications from the RPV water level instruments will remain valid after the blowdown.
- that the blowdown is performed before exceeding the environmental qualification limits of the ADS SRVs.
- that water hammer will not occur in the Well Water System when Drywell Cooling loop flow is restored.
- that the energy within the reactor is directed to the torus before exceeding the Torus Heat Capacity Temperature Limit.

ANSWER: b

Distracter 1: Operators must watch out for Sat Curve entry and unstable indications, but this is not a basis.

Distracter 2: Defeats 4 is concerned about DW cooling restoration after elevated temperatures, but this is not a basis for ED.

Distracter 3: ED is performed if the HCL will be exceeded, but HCL is based on RPV pressure and Torus Temp, not DW temp.

REFERENCE: EOP Bases.

K/A System: 295028 (High Drywell Temperature)

K/A Number: K3.01 (Knowledge of the reasons for the following responses as they apply to High Drywell Temperature: Emergency Depressurization)

K/A Value: 3.6/3.9

DAEC Objective: 95.00.00.20

Cognitive Level: 1 B

Source: Industry, Revised

55. The Electrohydraulic Control (EHC) System logic diagram provided on the next page.

The EHC system was in the following condition:

- Pressure Setpoint 940 psig
- Load Set Setpoint 600 MWe
- Load Limit 100%
- Max Combined Flow Limiter 125%

A transient occurs that results in a RISE in reactor pressure and a RISE in Main Turbine Throttle pressure to 980 psig

Which of the following CORRECTLY describes the response of the EHC system?

- a. The Pressure Set unit will shift control to the “B” pressure regulator.
- b. The Load Limit will be controlling and allow a maximum of 100% steam flow to the condenser.
- c. The Load Set Limiter will be controlling and will allow the Turbine Control Valves to open until the generator load is 600 MWe.
- d. The Max Combined Flow Limiter will be controlling and will allow the Turbine Control Valves to be fully open and with at least one Bypass Valve open.

ANSWER: d

Distracter 1: Both Pressure regulator would adjust their outputs equally an “A” would remain in control.

Distracter 2: Load Limit is set at 100% to limit the Main Generator to 100% of rated electrical load, and adjusts the Control Valves accordingly. This setting does not affect the Bypass Valves positioning.

Distracter 3: The Load set limiter is set at a higher value than pressure set and load limit and would not take control.

REFERENCE: SD-693.2a, Figure 8

K/A System: 295007 (High reactor pressure)

K/A Number: AA1.05 (Ability to operate and/or monitor as they apply to High reactor pressure: REACTOR/TURBINE PRESSURE REGULATING SYSTEM.)

K/A Value: 3.7/3.8

DAEC Objective: 99.16.01.06 Evaluate plant conditions and control room indications to determine if the EHC System is operating as expected, and identify any actions that may be necessary to place the EHC System in the correct lineup.

Cognitive Level: 3 PEO

Source: Exam Bank, Question # 2679

56. Reactor power was 100% when the “A” Reactor Feed pump tripped.

- 1) Do the Recirculation Pumps INITIALLY runback to 20% or 45%?
 - 2) Is this automatic runback expected to prevent a RPV low level scram?
- a. 1) 20%
2) YES; The runback will prevent a RPV low level scram.
 - b. 1) 20%
2) NO; The runback allows additional time for operator action prior to reaching the low level scram setpoint.
 - c. 1) 45%
2) YES; The runback will prevent a RPV low level scram.
 - d. 1) 45%
2) NO; The runback allows additional time for operator action prior to reaching the low level scram setpoint.

ANSWER: d

Note: Based on a Plant event. Follow up investigation confirmed that plant will not avoid a RPV low level scram from 100% power upon loss of a Feed Pump. SD 264 states that purpose is to “allow additional time for operator action prior to reaching the low level scram setpoint”. Pump discharge valve closed is a 20% or Feed flow <20 % is a 20% runback.

Distracter 1: 45% Runback not 20%. If recirc did runback all the way to 20% the low level scram might be avoided.

Distracter 2: 45% Runback not 20%. Reason is correct/

Distracter 3: Low level scram is unavoidable.

REFERENCE: System Description 264 Reactor Recirculation System, pages 31 and 32

K/A System: 295009 (Low Reactor Water Level)

K/A: AK3.01 (Knowledge of the reasons for the following responses as they apply to Low Reactor Water Level: RECIRCULATION PUMP RUNBACK)

K/A Value: 3.2/3.3

DAEC Objective: 12.00.00.02 Identify the conditions that allow or cause the following events to occur: RECIRC PUMP SPEED LIMITER IN EFFECT.

Cognitive Level: 1-I & B

Source: New

57. Given the following sets of parameters:

Case 1)	Torus Average Water Temperature, stable at	160°F
	RPV Pressure, stable at	800 psig
	Drywell Pressure, stable at	2 psig
	Torus Water Level, stable at	9.0 ft.
Case 2)	Torus Average Water Temperature, stable at	170°F
	RPV Pressure, stable at	500 psig
	Drywell Pressure, stable at	2 psig
	Torus Water Level, slowly lowering at	7.0 ft.

Is Emergency Depressurization (ED) required in each of these cases?

- a. Case 1) ED NOT required
Case 2) ED NOT required
- b. Case 1) ED NOT required
Case 2) ED required
- c. Case 1) ED required
Case 2) ED NOT required
- d. Case 1) ED required
Case 2) ED required

ANSWER: b

Note: This question may appear to be two chances of applying Torus Temp and RPV Pressure to EOP Graph 4; (Both cases are below the curve). It is really measuring the candidates understanding of low Torus level on this limit. The HCL limit graph is invalid below 8 ft. .ED is required not by Graph 4, but by Graph 5.

Distractor 1: Case 2 ED required

Distractor 2: Case 1 Not ED required; Case 2 ED required

Distractor 3: Case 1 Not ED required

REFERENCE: EOP-2 and Bases

K/A System: 295026

K/A Number: EA2.02 Ability to determine and/or interpret the following as they apply to Suppression Pool High Water Temperature: Suppression Pool Level

K/A Value: SRO 3.9

DAEC Objective: SRO 6.62 Direct crew response for performance of the T/T leg of EOP-2

Cognitive Level: 3-SPR

Source: NEW

58. A transient has occurred that resulted in power operations in the Exclusion Zone of the DAEC Stability Power/Flow Map.

The Panel 1C05 operator has been assigned to monitor for core thermal/hydraulic instability.

Assume that A, B, C, & D APRMs remain relatively stable at 52-55% throughout this period.

The Panel 1C05 operator observes these changes to E and F APRMs per the following timeline:

- Time 1:
Low to High values on E APRM are observed to be 50-57% with the band getting wider.
F APRM remains relatively stable at 52-55% at this time.
- Time 2:
Low to High values on E APRM are observed to be 49-58% with the band getting wider.
Low to High values on F APRM are observed to be 50-57% with the band getting wider.
- Time 3:
Low to High values on E APRM are observed to be 48-59% with the band getting wider.
Low to High values on F APRM are observed to be 49-58% with the band getting wider.
- Time 4:
Low to High values on E APRM are observed to be 47-60% with the band getting wider.
Low to High values on F APRM are observed to be 48-59% with the band getting wider.

Per AOP-255.2, "Power/Reactivity Abnormal Change", at which time is a manual reactor scram first required?

- a. Time 1
- b. Time 2
- c. Time 3
- d. Time 4

ANSWER: a

Note: Scram required for ANY APRM "undamped oscillations greater than normal".

Normal = 52-55% in this case. A previous definition was >10% swings.

Distracter 1: Selected if candidate thinks >1 APRM with undamped oscillations is necessary.

Distracter 2: Selected if candidate thinks any APRM with oscillations >10% is necessary.

Distracter 3: Selected if candidate thinks >1 APRM with oscillations >10% is necessary

REFERENCE: AOP 255.2 Power/Reactivity Abnormal Change, IPOI-3 Appendix 1

K/A System: 295014 (Inadvertent Reactivity Addition)

K/A Number: AK3.01 (Knowledge of the reasons for the following responses as they apply to Inadvertent Reactivity Addition: reactor scram).

K/A Value: 4.1/4.1

DAEC Objective: 94.03.04.01 Explain when a reactor scram is required per AOP 255.2.

Cognitive Level: 3-SPK

Source: NEW

59. A slightly modified version of the last five pages of a recently used Rod Pull Sheet are provided on the next page of this exam.

Step 39 rods are at position 12.

The OSS directs you to insert the CRAM Rods in response to a loss of feedwater heating transient.

The Rod Worth Minimizer has been bypassed.

Which Control Rod should be inserted FIRST?

And

HOW FAR should it be inserted when it is first moved?

- a. Rod 14-15
To position 12
- b. Rod 14-15
To position 00
- c. Rod 22-15
To position 10
- d. Rod 22-15
To position 00

ANSWER: d

Note; Loss of feedwater heating is listed in AOP 255.2 as a possible cause of Power / reactivity abnormal change and is one of the few known events in which the CRAM group is useful.

Distracter 1: Selected if candidate thinks Cram Groups are inserted from 5 to 1. Selected if candidate thinks rod is only inserted to the insert limit listed on the pull sheet.

Distracter 2: Selected if candidate thinks Cram Groups are inserted from 5 to 1.

Distracter 3: Selected if candidate thinks rod is only inserted to the insert limit listed on the pull sheet.

REFERENCE: IPOI-4 Section 6.0 Fast Power Reduction; AOP 255.2 "Power / reactivity abnormal change"

K/A System: 295014 (Inadvertent Reactivity Addition)

K/A Number: AA1.03 (Ability to operate and monitor the following as they apply to Inadvertent Reactivity Addition: RMCS.)

K/A Value: 3.5/3.5

DAEC Objective: 94.03.02.01 Explain the difference between the Cram Group and the Cram Method with regards to control rod insertion and where guidance on how to use the Cram Group/Method is located.

Cognitive Level: 3-SPR

Source: NEW

60. A Loss of Coolant Accident has occurred and Operators are performing EOP-2, "Primary Containment Control"?

The OSS receives the report that the Drywell and Torus pressure are both at 25 psig and rising steadily at 2 psig/minute. He directs the 1C03 operator to Emergency Depressurize (ED).

Which of the following states the basis for Emergency Depressurizing in this situation?

ED is performed...

- a. to ensure the Torus design temperature is not exceeded.
- b. to ensure the continued operability of RPV level instrumentation.
- c. because the pressure suppression function of the Torus has been lost.
- d. because the Primary Containment Pressure limit has been exceeded.

ANSWER: c

Distracter 1: This is one of the bases for ED due to Torus Water Temp and RPV Pressure ; Heat Capacity Limit

Distracter 2: RPV level indications are challenged by high DW pressure and temp, but this is not the basis.

Distracter 3: PCPL is 53 psig. At 2psig/min, that will be in 14 minutes. The operator action for this challenge is to vent the containment.

REFERENCE: EOP Bases Document, Rev. 5, EOP 2, page 65 of 69

K/A System: 295024 (High Drywell Pressure)

K/A Number: EK3.04 (Knowledge of the reasons for the following responses as they apply to High Drywell Pressure: EMERGENCY DEPRESSURIZATION.)

K/A Value: 3.7/4.1

DAEC Objective: 95.00.00.15 Explain the bases for each of the EOP Curves and Limits.

Cognitive Level: 1B

Source: Modified Exam Bank,

61. Operators have scrammed the reactor due to a partial loss of the Well Water system while at power. Drywell pressure is 2.5 psig and rising slowly as operators attempt to mitigate this transient.

Which of the following is **NOT** a viable mitigation strategy for lowering Drywell pressure?

- a. Begin a plant cooldown.
- b. Vent the Containment and begin de-inerting.
- c. Bypass the Reactor Bldg. Main Intake cooling coils.
- d. Initiate the Containment Atmosphere Dilution (CAD) system.

ANSWER: d

Note: CAD initiation is directed only in EOPs and SAGs for hydrogen control. There is no cooling benefit from CAD.

Distracter 1: Directed by ARP.

Distracter 2: Directed by ARP.

Distracter 3: Directed by ARP.

REFERENCE: ARP 1C05B B-1(Primary Containment HI-LO Pressure; 1.5 psig alarm)

K/A System: 295010 (High Drywell Pressure-Abnormal)

K/A Number: AK1.03 (Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE; Temperature increases.)

K/A Value: 3.2/3.4

DAEC Objective: 99.03 (Respond to Primary Containment HI-LO Pressure)

Cognitive Level: 1-P

Source: NEW

62. The plant was operating at full power for two months in the middle of core life when a turbine control problem resulted in a Reactor Vessel High Pressure trip.

The Low-Low Set (LLS) SRVs responded as designed and opened soon after the trip.

The operating crew is attempting to stabilize RPV pressure TWO MINUTES after the start of the transient. As the 1C03 operator, you have the following information:

- The Turbine Bypass Valves are closed.
- The Main Steam Line (MSL) Drains are open.
- The green, red, and amber lights are illuminated for both LLS SRVs.
- Reactor pressure is 980 psig and lowering at a rate of 10 PSIG / MINUTE.

Which of the following statements is CORRECT concerning these indications and heat energy still being produced by the reactor?

- a. RPV pressure is being controlled by LLS and MSL Drains.
The heat energy still being produced by the reactor is NORMAL decay heat.
- b. RPV pressure is being controlled by MSL drains because the LLS SRVs are not open.
The heat energy still being produced by the reactor is NORMAL decay heat.
- c. RPV pressure is being controlled by LLS and MSL Drains.
The heat energy still being produced by the reactor is HIGHER THAN NORMAL decay heat due to the power history before the reactor was shutdown.
- d. RPV pressure is being controlled by LLS and MSL Drains.
The heat energy still being produced by the reactor is MUCH HIGHER THAN NORMAL and indicates that the reactor is not shutdown.

ANSWER: d

Note: Reactor decay heat 1 second after shutdown is 6.2%. Each SRV has $\approx 8\%$ power steam flow capacity, so with two LLS SRVs open, pressure should be lowering much faster than 10 psig/min.

Distracter 1: Decay heat rate is not normal.

Distracter 2: Decay heat rate is not normal and the LLS valves are open.

Distracter 3: Decay heat rate would never be 16% with the reactor shutdown.

REFERENCE: SD 183.1; ARP 1C03A D-5; 1C05B C-4

K/A System: 295025 (High Reactor Pressure)

K/A Number: EA2.05 (Ability to determine and/or interpret the following as they apply to High Reactor Pressure: DECAY HEAT GENERATION.)

K/A Value: 3.4/3.6

DAEC Objective: 8.03.01.03 (Evaluate plant conditions and control room indications to determine if the ADS system or the LLS system is operating as expected and identify any actions that may be necessary to place the ADS/LLS systems in the correct lineup.)

Cognitive Level: 3-SPK

Source: NEW

63. An ATWS has occurred and the crew is intentionally lowering RPV level to reduce reactor power.

The MSIVs remain open and there is no challenge to Primary Containment.

At +130", reactor power drops to less than 5%, but the OSS directs the 1C05 operator to continue lowering RPV level to less than +87".

Which of the following is the EOP basis for the continued lowering of RPV level?

This action is intended to ...

- a. minimize dilution of the boron being injected.
- b. eliminate boron carryover down the steam lines.
- c. reduce the severity of thermal hydraulic instabilities.
- d. provide a margin for error in keeping reactor power less than 5%.

ANSWER: c.

Note: +87" is 2 ft. below lowest feedwater sparger nozzle. This places the spargers in the steam space which effectively heats the relatively cold feedwater. Less subcooling reduces instabilities.

Distractor #1: Not the stated purpose, but less water tend to concentrate the boron being injected.

Distractor #2: Not the stated purpose, but carryover certainly would be eliminated that far from the steam lines

Distractor #3: Not the stated purpose but it would provide a margin for error. This is a possible misconception. 43" is a lot of margin.

REFERENCE: EOP Program Manual, ATWS section, Rev. 4

K/A SYSTEM: 295037 (SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown.)

K/A NUMBER: EK1.02 (Knowledge of the operational implications of the following concepts as they apply to: SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: REACTOR WATER LEVEL EFFECTS ON REACTOR POWER)

K/A VALUE: 4.1/4.3

DAEC Objective: 95.55.01.01

Explain how the mitigation strategies used in ATWS accomplish the purpose of ATWS.

Cognitive Level: 1-B

Source: New

64. A design basis LOCA occurred several hours ago, emergency system failures coupled with electrical transients resulted in hydrogen generation due to RPV water level being below the top of active fuel for too long. The Shift Supervisor has asked you to check plant parameters to determine if Containment Atmosphere Dilution (CAD) can be initiated.

Which of the following **WOULD NOT** be a consideration for initiating the Containment Atmosphere Dilution system?

- a. Current primary containment pressure
- b. The ability to vent the primary containment
- c. The status of the containment spray subsystems in use
- d. The ability to start the containment purge fan, 1V-EF-17

ANSWER: d

Distracter 1: CAD Loop Control Valves (MO-4320A/B) will auto close if drywell pressure exceeds 30 psig.

Distracter 2: SEP 303.3. steps dictate which CAD spray header to inject with dependent on if you are venting containment from the Drywell or Torus. SEP 303.4 lists 3 reasons venting may be necessary during Cad injection.

Distracter 3: Procedural requirement to ensure that CAD system injection does not use a spray header that is being used by Containment Spray.

REFERENCE: SD-573, Containment Auxiliaries, Pages 27 and 28, SEP-303.3 CAD Initiation for H2 Control in SAG; SEP 303.4 CAD Initiation for EOP H2 Control

K/A System: 500000 (High Containment Hydrogen Concentration)

K/A Number: EA1.07 (Ability to operate and/or monitor the following as they apply High Containment Hydrogen Concentration: NITROGEN PURGE SYSTEM)

K/A Value: 3.4/3.3

DAEC Objective: 42.01.01.09

Given a Primary Containment and Containment Atmosphere Monitoring and Control Systems operating mode and various plant conditions, predict how the Primary Containment and Containment Atmosphere Monitoring and Control Systems and each of the supported systems will be impacted by the following operations, conditions, or failures: CAD initiation.

Cognitive Level: 2-RI

Source: Exam Bank

65. The plant was operating at 100% power, when an electrical transient occurred. The following is a partial list of current plant conditions:

- “A” Circ Water pump is tripped.
- PCIS group 3 DIV 1 isolated.
- “A” SFU auto initiated.
- “A” Recirc scoop tube locked up.

Given the above information, which of the following statements is CORRECT?

- a. Manually lock the “B” recirc scoop tube.
- b. If necessary, vent the primary containment IAW EOP defeat 9.
- c. If necessary, open CV 1611 the “B” Reactor feed pump recirc valve to maintain RPV level.
- d. Monitor condenser backpressure and insert a manual scam if it cannot be maintained <7.5" Hg A.

ANSWER: d

Distracter 1: Reduce “B” Recirc Speed Control to minimum to reduce feedwater flow requirements and maintain condenser backpressure <5”HgA per AOP-317 Immediate Action 1.

Distracter 2: Not entered EOPs at this time therefore EOP defeats are not used, and AOP-317 Immediate Action 2 provides steps to vent containment.

Distracter 3: This step is used for a Loss of Uninterruptible AC power, it is not applicable for this mode of power failure.

REFERENCE: AOP 317

K/A System: 295002 (Loss of Main Condenser Vacuum)

K/A Number: AK1.03 (Knowledge of the operational implications of the following concepts as they apply to Loss of Main Condenser Vacuum: LOSS OF HEAT SINK)

K/A Value: 3.6/3.8

DAEC Objective: 32.05.02.07

Predict how each supported systems will be impacted by a loss of the Cooling Towers or a degradation or loss of the Circulating Water System.

Cognitive Level: 3 PEO

Source: Exam Bank

66. The SBDG is operating in parallel with the Startup Transformer for surveillance testing, carrying a load of 2500 KW.

A lightning strike trips OPEN the Startup and Standby transformer incoming breakers (J, K, and M).

Select the answer which correctly describes the initial response of the SBDG to this event.

- a. SBDG speed will increase and the engine may trip on overspeed.
- b. The SBDG output breaker will stay closed but the bus will load shed.
- c. The SBDG will trip, restart on bus undervoltage and the SBDG output breaker will close back in.
- d. The SBDG output breaker will trip, the bus will load shed and the SBDG output breaker will close back in.

ANSWER: a

Distracter 1: The breaker may trip when the DG trips on overspeed.

Distracter 2: The output breaker does not close back in following trip.

Distracter 3: The SBDG does not restart when tripped on overspeed.

REFERENCE: SD 324, revision 1

K/A System: 295003 (Partial or Complete Loss of A. C. Power)

K/A Number: AK2.02 (Knowledge of the interrelations Partial or Complete Loss of A. C. Power and the following: EMERGENCY GENERATORS)

K/A Value: 4.1/4.2

DAEC Objective: 19.00.00.03

Evaluate plant conditions and control room indications to determine if the SBDG is operating as expected and identify any actions that may be necessary to place the SBDG in the correct lineup.

Cognitive Level: 3 PEO

Source: Exam Bank

67. The plant has experienced a LOSS OF COOLANT ACCIDENT with multiple equipment failures.

The 10 minute timer on the non-selected "A" RHR loop has timed out and the 1C03 operator has started injecting into the "A" Recirc loop. RPV level has begun to rise slowly.

Operators have also just gotten word that the in-plant operators have been able to manually open the failed RHR inject valve to the selected "B" Recirc loop and the 1C03 operator observes RHR injection flow into "B" Recirc loop. At this point, indicated RPV levels begins to rise at a faster rate.

The following plant parameters are reported to you, the OSS:

- Drywell Average Air Temperature 265°F (slowly lowering)
- Drywell Pressure 10 psig (slowly lowering)
- RPV Pressure 50 psig (slowly lowering)
- RPV levels:
 - "A" Fuel Zone 85" (rising)
 - "B" " Fuel Zone 65" (rising)
 - Wide Range Yarways 40" (rising)
 - Narrow Range GEMACs Downscale

Based on the above information, which of the following is CORRECT concerning RPV Level?

- a. RPV level is 40" and rising.
- b. RPV level is 65" and rising.
- c. RPV level is 85" and rising.
- d. RPV level is indeterminate but rising at this time.

ANSWER: d

Distracter 1 & 2: Injection into A and/or B Recirc loops makes the associated Fuel Zone Indicator read artificially high during the injection

Distracter 3: A rapid depressurization has occurred making the Wide Range Yarway unusable.

REFERENCE: EOP-1 Cautions Bases; SD-880

K/A System: 295031 (Reactor Low Water Level)

K/A Number: EA2.01 (Ability to determine or interpret as they apply to Reactor Low Water Level: Reactor Water Level)

K/A Value: SRO 4.6*

DAEC Objective: SRO Task 1.21 Direct crew response to off normal events/accidents.

SRO Objective 1.21.02.01 Verify the initial conditions using alternate indications.

Cognitive Level: 2-RI

Source: Bank

68. A fire in the 1D1 battery room has resulted in the COMPLETE LOSS OF ALL 125 VDC. The auxiliary operator is in the switchyard and the second assistant is in the turbine building.

The Main Turbine/Generator is still in operation.

From the list of options below, select the CORRECT sequence for securing the Main Turbine/Generator?

1. Trip the H and I breakers
 2. Transfer 1A1 and 1A2 to the Startup Transformer
 3. Trip the generator field breaker
- a. 1, 3, 2
 - b. 2, 1, 3
 - c. 2, 3, 1
 - d. 3, 1, 2

ANSWER: b

Distractor 1: Per AOP-302.1 page 3 sequence. Tripping H&I open first will cause an Open Circuit transfer of Non-Ess Busses.

Distractor 2: Per AOP-302.1 page 3 sequence. Tripping the Generator Field Breaker open first will cause the Generator Backup Lockout Relay to energize, and an Open Circuit transfer of the Non-Ess Busses.

Distractor 3: Per AOP-302.1 page 3 sequence. Tripping the Generator Field Breaker open first will cause the Generator Backup Lockout Relay to energize, challenge to the Turbine overspeed protection.

REFERENCE: AOP 302.1 LOSS OF 125 VDC DIV 1 (page 3 of 34)

K/A System: 295004 (Partial or Complete Loss of D. C. Power)

K/A Number: AA1.03 (Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of D. C. Power: A. C. ELECTRICAL DISTRIBUTION.)

K/A Value: 3.4/3.6

DAEC Objective: 94.06.01.02

Describe how a loss of one or both divisions of 125 VDC affects plant systems and status during all modes of operation.

Cognitive Level: 2-RI

Source: Exam Bank

69. The Primary Containment Ventilation system and plant status are as follows:

- The reactor is shutdown.
- All Recirculation fan handswitches are in AUTO.
- The Mode Switch for “A” Loop of Drywell Cooling is in the AUTO position.
- Fans 1A, 2A, 3A, 4A, 5A, 6A, 7A, & 7B are running in HIGH speed.
- The Mode Switch for “B” Loop of Drywell Cooling is in the STANDBY position.
- Fans 1B, 2B, 3B, 4B, 5B & 6B are OFF.
- Drywell pressure is 1.6 psig.
- Well Water outlet temperatures from “B” Loop Coolers are all approximately 110°F.
- Air outlet temperature from the 1A & 1B Coolers is 140°F.

Select the statement that is correct concerning the status of the Primary Containment Ventilation system.

- a. The system is operating as expected for these conditions.
- b. All Drywell Cooling Fans should be running in HIGH speed due to the elevated Drywell pressure.
- c. All Drywell Cooling Fans should be running in HIGH speed due to the elevated “B” Loop Coolers Well Water outlet temperatures.
- d. All Drywell Cooling Fans should be running in HIGH speed due to the elevated 1A & 1B Coolers Air outlet temperature.

ANSWER: d

Note: Per ARP 1C25A[B] A-4 & OI-760 P&L#4, All fans switch to High speed and isol valves open at 120°F cooler water out or 135°F air temp out.

Distractor 1: B Loop fans should be running due to Loop overtemperature of >135°F. Plausible because temperature is less than 150°F EOP entry setpoint.

Distractor 2: Drywell pressure is elevated but it is below the 2# setpoint that would shift all fans to slow speed. Fans do not auto start on DW pressure.

Distractor 3: This is a very high temperature for Well Water but still below the 120°F Loop Overtemperature Auto initiation.

REFERENCE: 1C25A[B], A-4, Drywell Cooling Loop “A”[“B”] Over Temp, OI-760 P&L #4.

K/A System: 295012 (High Drywell Temperature)

K/A Number: AK2.01 (Knowledge of the interrelations between High Drywell Temperature and the following: DRYWELL VENTILATION.)

K/A Value: 3.4/3.5

DAEC Objective: 68.00.00.05 Evaluate plant conditions and control room indications to determine if the Primary Containment Ventilation System is operating as expected, and identify any actions that may be necessary to place the Primary Containment Ventilation System in the correct lineup.

Cognitive Level: 1-I

Source: Revised, Exam Bank

70. The plant is at full power.

One loop of RHR is in the Torus Cooling mode with full RHR and RHRSW flow.

At this point a Safety Relief Valve (SRV) fails FULL OPEN.

The other loop of RHR is quickly placed in Torus Cooling and flows maximized.

Which of the following CORRECTLY describes the expected response of Torus water temperature if the SRV CAN NOT be closed?

- a. Torus water temperature will still be LOWERING with only one loop of Torus Cooling on and LOWER EVEN FASTER when the second loop of Torus Cooling is placed in service.
- b. Torus water temperature will STABILIZE with only one loop of Torus Cooling on and BEGIN TO LOWER when the second loop of Torus Cooling is placed in service.
- c. Torus water temperature will RISE with only one loop of Torus Cooling on and BEGIN TO LOWER when the second loop of Torus Cooling is placed in service.
- d. Torus water temperature will RISE with only one loop of Torus Cooling on and CONTINUE TO RISE when the second loop of Torus Cooling is placed in service.

ANSWER: d

Note: An operator should know that the RHR system Torus Cooling mode is not designed to keep up with a stuck open SRV. This is the most limiting Torus cooling event with Max Temperature reaching 194°F.

Distractor 1: Temp goes up and continues to go up.

Distractor 2: Temp goes up and continues to go up.

Distractor 3: Temp goes up and continues to go up.

REFERENCE: UFSAR 6.2.1.3.3.3

K/A System: 295013 (High Suppression Pool Temperature)

K/A Number: AK2.01 (Knowledge of the interrelations between High Suppression Pool Temperature and the following: SUPPRESSION POOL COOLING.)

K/A Value: 3.6/3.7

DAEC Objective: 2.01.01.08 (State the purpose of the RHR system)

Cognitive Level: 1-B

Source: NEW (Modeled after 1998 Clinton ILC exam)

71. Which of the following annunciators or sets of annunciators would be consistent with the Containment Isolation Monitoring System (CIMS) indications provide on the next page?
- 1C05A, A-1; REACTOR LO-LO-LO LEVEL TRIP
 - 1C05B, C-2; MAIN STEAM LINE HI HI RAD / INOP TRIP
 - 1C05A, B-8 and 1C05B, B-7; PCIS CHANNEL A&B MAIN STEAM LINE HI FLOW
 - 1C05A, C-8 and 1C05B, C-7; PCIS CHANNEL A&B MAIN STEAM LINE LOW PRESSURE

ANSWER: b

Note: A steam line break without isolation is the most limiting event for an offsite release. MSL high rad was originally a full Group 1 isolation. Currently, this signal closes only the Recirc sample valves, the MSL drain valves and trips the mechanical vacuum pump.

Distracter 1, 2, 3: All of these signals cause a full Group 1 isolation and would also result in the amber and green lights for the "MSIVS".

REFERENCE: ARP 1C05B, C-2 and A-8

K/A SYSTEM: 295017 (High Off Site Release Rate)

K/A Number: A1.11 (Ability to operate and/or monitor the following as they apply to High Off Site Release Rate: PCIS/NSSSS)

K/A Value: 3.9/4.1

DAEC Objective: 48.01.01.01 (Describe how the Main Steam System responds to a Group 1 isolation signal.)

Cognitive Level: 3 SPK

Source: NEW

72. Of the nine (9) PCIS group isolations listed below, HOW MANY can be initiated by HIGH AREA TEMPERATURES within the Secondary Containment?

- Group 1 Main Steam Isolations
 - Group 2 Radwaste Isolation valves
 - Group 3 Containment Atmosphere Isolations
 - Group 4 RHR Shutdown Cooling Isolations
 - Group 5 RWCU Isolations
 - Group 6A/B RCIC/HPCI Isolations
 - Group 7 RBCCW and Well Water Containment Cooling
 - Group 8 RCIC and HPCI Condensate returns
 - Group 9 RCIC and HPCI Vacuum Breaker line
- a. 1 PCIS group
- b. 2 PCIS groups
- c. 3 PCIS groups
- d. 4 PCIS groups

ANSWER: c

Distracter 1, 2, & 3: Only Groups 1 (MSIVs), Group 4 (RWCU) and 6A/B (RCIC & HPCI) can be initiated by area temperatures.

REFERENCE: SD 959.1

K/A System: 295032 (High Secondary Containment Temperature)

K/A Number: EK2.04 (Knowledge of the interrelations between High Secondary Containment Temperature and the following: PCIS/NSSS)

K/A Value: 3.6/3.8

DAEC Objective: 42.08.01.07 (List the signals which cause Primary containment and Containment Atmosphere Monitoring and Control isolations.)

Cognitive Level: 1-I

Source: NEW

73. The reactor is at 100% power with the Well Water System in the following lineup:

- The A and B Well Water Pumps are running.
- The Well Water Logic Control Switch, SW1, is in the PUMPS position.

Predict how the Well Water System would respond if the B Well Water Pump tripped off and identify the reason for the system response.

- a. The Control Building Chillers bypass valve opens to shift the chiller heat load to ESW.
- b. The Domestic Water Storage Tank supply valve closes to ensure all flow is into the essential loads.
- c. The selected Condenser Air Cooling Coil isolates to remove the heat input from the Condenser Bay.
- d. The Main Plant Intake Coils isolate to maximize cooling to the Drywell. (The Intake Coil bypass valve opens on interlock.)

ANSWER: d

Distractor a: ESW is manually started to supply cooling to the Control Building Chillers per AOP 408, Immediate Actions, Step 2.

Distractor b: Domestic Water is manually isolated per AOP 408, Follow-up Actions, Step 6.

Distractor d: The selected cooler remains in service per AOP 408 Automatic Actions.

REFERENCE: AOP 408, Automatic Actions

K/A SYSTEM: 295018 (Partial or Complete Loss of Component Cooling Water)

K/A Number: AK3.01 (Knowledge of the reasons for the following responses as they apply to Partial or Complete Loss of Component Cooling Water: ISOLATION OF NON-ESSENTIAL HEAT LOADS.)

K/A Value: 2.9/3.2

DAEC Objective: 26.01.01.14

List the signals which cause a Well Water System isolation including purpose, setpoints, and logic. Predict how the Well Water System responds to an isolation signal.

Cognitive Level: 2-RI

Source: Modified, Exam Bank

74. The reactor has failed to scram from 100% power. The following conditions exist:

- Several control rods are NOT fully inserted. Operators are making every effort to get them inserted.
- The MSIVs are closed and RPV pressure is being controlled by the SRVs.
- The crew has been briefed to prepare for Emergency Depressurization due to degraded containment conditions.
- Standby Liquid Control (SBLC) is being injected with both pumps.

Which one of the following conditions requires tripping of the SBLC pumps ?

- a. All APRMs are downscale.
- b. The RPV has been Emergency Depressurized.
- c. The SBLC Storage Tank level decreases to 0%.
- d. All control rods are inserted to at least position 04.

ANSWER: c

Distracter 1: This is a breakpoint for power level control, not shutdown of the SBLC pumps.

Distracter 2: ED changes nothing.

Distracter 3: DAEC Max Subcritical Banked Withdrawal Position is 02.

REFERENCE: OI-153

K/A System: 295037 (Scram condition present and Rx Power above APRM Downscals or unknown)

K/A Number: EA2.03 (Ability to determine and/or interpret the following as they apply to Scram condition present and Rx Power above APRM Downscals or unknown: SBLC Tank Level.

K/A Value: SRO 4.4*

DAEC Objective: SRO Task 6.56 Direct crew response to perform /Q to reduce power/scram during an ATWS.

Cognitive Level: 1-P

Source: Bank

75. An ATWS has occurred coupled with a loss of both CRD pumps. EOP ATWS-RPV Control has been entered. Emergency Depressurization may be required in approximately 15 to 20 minutes due to low reactor water level.

Which of the following EOP ATWS operator actions will be adversely affected by the Emergency Depressurization?

- a. Inject boron into the RPV with SBLC per OI-153
- b. Toggle Individual scram test switches per RIP 103. 1
- c. Reset ARI. Defeat interlock if necessary per Defeat 12
- d. Increase CRD cooling flow and pressure per RIP 103.2

ANSWER: b

Distractor 1: Lowering reactor pressure should not affect the ability to inject SBLC into the vessel.

Distractor 2: Defeat 12 is not affected by lowering reactor pressure, but bypasses a reactor high pressure signal of 1140 psig. The ARI solenoids will reset.

Distractor 3: If the CRD pumps can be restarted, lowering reactor pressure should not hinder this rod insertion procedure.

REFERENCE: EOP ATWS, EOP DEFEAT 12, RIP-103.1

K/A System: 295022 (Loss of CRD Pumps)

K/A Number: AK1.02 (Knowledge of the operational implications of the following concepts as they apply to Loss of CRD Pumps: REACTIVITY CONTROL).

K/A Value: 3.6/3.7

DAEC Objective: 10.01.01.09 Predict the effects that a loss of CRD Hydraulic System would have upon the following supported systems: Reactor Recirculation System, GEMAC Reference Leg Backfill System.

101.14 Respond to a complete loss of CRD Water flow.

Cognitive Level: 2-RI

Source: INPO Exam Bank

76. The plant was in normal full power operation on a weekend when a STATION BLACKOUT occurred in conjunction with a loss of high pressure injection systems.

Both Standby Diesel Generators have started but have not reenergized the essential busses due to Bus Lockouts on 1A3 and 1A4.

Electricians have been called out to investigate but they are not yet on site. Operators have performed a visual inspection and verified NO APPARENT DAMAGE to either 1A3 or 1A4.

RPV level has been lowering steadily and, 15 minutes after the plant trip, is at 50 inches.

Which of the following CORRECTLY describes the restrictions on manually resetting the 1A3 and/or 1A4 bus lockouts in order to establish low pressure injection?

- a. ONE manual reset of 1A3 or 1A4 lockout may be attempted before Electricians arrive. If that lockout resets, NO attempt may be made to reset the other bus.
- b. ONE manual reset of 1A3 or 1A4 lockout may be attempted before Electricians arrive. If that lockout resets, ONE attempt may be made to reset the other bus.
- c. ONE manual reset of 1A3 or 1A4 lockout may be attempted but only after consultation with Electricians. If that lockout resets, and the Electricians agree, ONE attempt may be made to reset the other bus.
- d. NO manual reset attempts may be made until Electricians have completed a full inspection of each bus.

ANSWER: a

Note: This is the highest ranking DAEC PRA initiating event for core damage frequency.

Distractor 1: Manual reset of ONLY one bus is allowed if necessary and after sat visual inspection.

Distractor 2: Manual reset of ONLY one bus is allowed if necessary and after sat visual inspection. AOP say to not wait for electricians.

Distractor 3: Manual reset of one bus is allowed if necessary and after sat visual inspection.

REFERENCE: AOP 3.01

K/A System: 295031 (Reactor low water level- Emergency)

K/A Number: Generic 2.4.8 (Knowledge of how event based Emergency/Abnormal operating procedures are used in conjunction with symptom based EOPs.)

K/A Value: SRO 3.7

DAEC Objective: SRO 5.38.02 (Direct operator actions to mitigate the consequences of a Loss of Offsite Power and stabilize plant parameters.)

Cognitive Level: 3-SPK

Source: New

77. An accident has occurred.

Current plant conditions are as follows:

All control rods are inserted.

Reactor water level 130" and stable
Reactor pressure 55 psig and stable

Drywell pressure: 4 psig and slowly lowering
Drywell temperature: 145°F and stable
Torus pressure: 3 psig and slowly lowering
Torus water temperature: 190°F and stable
Torus water level 10.4 ft. and stable

Torus and Drywell Sprays are in operation.

Torus Cooling is maximized.

"A" and "B" Core Spray pumps are injecting into the RPV.

Assuming all systems function as expected, which of the following represents a potential concern?

- a. Structural damage to the SRV tailpipes.
- b. Low pressure ECCS pumps could lose NPSH and cavitate.
- c. Introduction of air into the containment with the potential for deflagration conditions.
- d. Failure of the Torus to Drywell vacuum breakers to function, causing drywell spray operation to be prohibited.

ANSWER: b

Distractor 1: A consideration on very high Torus level, >13.8 ft.

Distractor 2: Drop in drywell pressure will isolate containment spray valves.

Distractor 3: Torus level of 13.5 ft is the level of concern for Torus to Drywell vacuum breakers.

REFERENCE: EOP Curves and Limits, NPSH Curves

K/A System: 295026 (Suppression Pool High Water Temperature)

K/A Number: EK1.01 (Knowledge of the operational implications of the following concepts as they apply to Suppression Pool High Water Temperature: PUMP NPSH)

K/A Value: 3.0/3.4

DAEC Objective: 95.00.00.17

Evaluate plant status and control room indications to determine the applicability and effect of any EOP Curve or Limit.

Cognitive Level: 3 SPK

Source: New Question

78. A plant startup was in progress when an electrical fault tripped the “B” Recirc pump resulting in annunciator 1C04B (A-1) “B” RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD. Operators have stabilized the plant and you, as the OSS, have directed them to perform the actions for Single Loop Operations.

- The B Recirc pump has been properly secured and its discharge valve reopened after 5 minutes.
 - Reactor power was 70% with a load line of 100%.
 - The speed of the “A” Recirc pump is currently at 41%.
- 1) Is it expected that the actual flow in the “B” Recirc Loop be FORWARD or REVERSE in this plant condition?
 - 2) Will that make the 1C05 TOTAL CORE FLOW indication ACCURATE or NOT ACCURATE for your decisions as an OSS?
 - a. 1) FORWARD
2) 1C05 TOTAL CORE FLOW indication will be ACCURATE because the “B” Loop forward flow will be added to the “A” Loop forward flow.
 - b. 1) FORWARD
2) 1C05 TOTAL CORE FLOW indication will NOT BE ACCURATE because the “B” Loop forward flow will be subtracted from the “A” Loop forward flow.
 - c. 1) REVERSE
2) 1C05 TOTAL CORE FLOW indication will be ACCURATE because the “B” Loop reverse flow will be subtracted from the “A” Loop forward flow.
 - d. 1) REVERSE
2) 1C05 TOTAL CORE FLOW indication will NOT BE ACCURATE because the “B” Loop reverse flow will be subtracted from the “A” Loop forward flow.

ANSWER: b

Note: With the trip annunciator in, the field breaker would be open, which causes the flows to be subtracted from each other. Reverse flow does not occur in the idle loop until the operating pump speed is >50%, but it is given at 41%.

Distractor 1: If all flow is forward, these values should be added, not subtracted for an accurate reading.

Distractor 2: Flow would be forward, not reverse. The indication would not be accurate when subtracting a flow that is actually forward.

Distractor 3: Flow would be forward, not reverse.

REFERENCE: SD 264 pg 40&41; ARP 1C04A A-6

K/A System: 295001 (Partial or complete loss of forced circulation)

K/A Number: A2.03 (Ability to determine and/or interpret the following as they apply to Partial or complete loss of forced circulation: Actual Core Flow.)

K/A Value: 3.3/3.3

DAEC Objective: 97.08 Perform Single Loop Operation STP.

Cognitive Level: 2-RI

Source: NEW

79. Evaluate the following control room indications and determine the effect of these conditions being established.

All control rods full in	
Reactor pressure	950 psig
Reactor water level	190"
Reactor power	120 cps

Drywell pressure	20 psig
Drywell air temperature	325°F
Torus pressure	17 psig
Torus water temperature	160°F
Torus water level	9.0 ft

- The Pressure Suppression Pressure Limit has been exceeded and Emergency Depressurization must be performed.
- The Boron Injection Initiation Temperature Limit has been exceeded and Boron must be injected because the Heat Capacity Limit may be exceeded.
- The RPV Saturation Temperature has been exceeded and Fuel Zone and GEMAC RPV water level indications must be adjusted by subtracting 23 inches.
- The Heat Capacity Limit has been exceeded and Emergency Depressurization must be performed if reactor pressure or torus temperature cannot be reduced.

ANSWER: d

Note: **EOP-1, EOP-2, and ATWS flowcharts are provided.**

Distracter 1: PSP is not exceeded until 18 psig at 9 ft. Plausible if drywell pressure is used.

Distracter 2: Boron should be injected above 150°F when power is below 2.2% if ATWS-EOP has been entered. With the reactor shutdown, ATWS EOP should not be entered and Boron should not be injected.

Distracter 3: RPV Sat curve is exceeded above 350°F when above 120 psig RPV pressure.

REFERENCE: EOP Curves and Limits

K/A System: 295030 (Low Suppression Pool Water Level)

K/A Number: EK1.03 (Knowledge of the operational implications of the following concepts as they apply to Low Suppression Pool Water Level: HEAT CAPACITY

K/A Value: 3.8/4.1

DAEC Objective: 95.00.00.17

Evaluate plant status and control room indications to determine the applicability and effect of any EOP Curve or Limit.

Cognitive Level: 3 SPR

Source: New Question

80. A radiological release accident has occurred while operating at power. The accident was severe enough to cause a Group 3 isolation due to Reactor Building Vent Shaft high radiation levels.

While responding to this event, operators identify that annunciator 1C35A, C-3 REACTOR BLDG KAMAN 3, 4, 5, 6, 7 & 8 HI RAD OR TROUBLE has activated. (A.K.A.: KAMAN red alarm)

The Standby Gas Treatment (SBGT) trains are both operating as designed and the Reactor Bldg. to outside ΔP is approximately 0.35 inches of water as read at 1C23.

Which of the following malfunctions would account for the indications described above?

- The SBGT overpressure relief damper has failed open.
- The MAIN PLANT EXHAUST FANS (EF-1, 2, &3) have failed to trip as designed on a Group 3 Isolation signal.
- The REFUELING POOL EXH FAN (EF-10) has failed to trip as designed on a Group 3 Isolation signal.
- The RX BLDG EXH FAN (EF11A& B) INLET ISOL DAMPERS (1V-AD-13A & B) have failed to completely isolate as designed on a group 3 Isolation signal.

ANSWER: d

Distractor 1: This damper lifts on a positive pressure when venting the containment. It relieves to the Rx Bldg. 2nd floor, which is still inside containment.

Distractor 2: Common misconception. EF 1, 2, & 3 do not trip on a Group 3. Their exhaust from the plant is the sample point for KAMAN 3-8. High rads there indicate that the reactor Bldg Vent shaft did not isolate from the main plant exhaust plenum (at 1V-AD-13A&B) and that EF-1, 2, &3 are also assisting SBGT at keeping the Rx Bldg negative. That is the reason the ARP directs shutdown of EF1, 2, &3.

Distractor 3: This fan draws air from the refuel floor and discharges into the Rx Bldg Vent Shaft. If 1V-AD 13A&B had isolated as designed, this exhaust would never get to the KAMAN 3-8 monitors.

REFERENCE: SD733; ARP 1C05B C-8; ARP 1C35A, C-3

K/A System: 295038 (High Offsite Release Rate.)

K/A Number: 2.4.48 (Ability to interpret control room indications to verify the status and operation of system / and understand how operator actions and directives affect plant and system conditions.)

K/A Value: 3.5/3.8

DAEC Objective: 95.71.04.02 (For any step, caution, or continuous recheck statement in EOP-4, explain the basis for the statement.)

Cognitive Level: 3-SPK

Source: NEW

81. The plant was operating in Mode 1, with all systems operable, when a transient occurred that resulted in the following conditions:

- An electrical ATWS has occurred.
- Reactor power 20% (slowly lowering)
- Reactor water level 150" (being intentionally lowered)
- Reactor pressure 880 psig (stable with MSIVs open)

Annunciator REACTOR BLDG ARM HI RAD, 1C04B A-6, has started to alarm.

Assume that each of the systems listed below could be the source of a leak that is causing that alarm.

- 1) Both CRD pumps are running.
- 2) RCIC is running on minimum flow.
- 3) HPCI is running in CST-CST mode.
- 4) The RWCU system is in normal operation with two demineralizers.

The OSS briefed the crew that EOP 3 was entered and that the crew must isolate systems "not required to be operated by EOPs".

Which system must be KEPT IN OPERATION even if it is the source of the leak?

- a. CRD
- b. RCIC
- c. HPCI
- d. RWCU

ANSWER: a

Note: EOP-3 says to isolate all systems discharging into area except: 1-Required for EOPs and 2-needed to suppress a fire. EOP-3 does not include "needed to shutdown reactor" but EOP-3 bases does.

Distracter 1: RCIC is not needed for level control if level is being intentionally lowered and feedwater is available.

Distracter 2: HPCI not needed for RPV pressure control.

Distracter 3: RWCU would be needed for high coolant activity, but should be isolated if SBLC is being used and is not needed for EOP pressure control.

REFERENCE: EOP Bases Document, EOP 3, page 15 of 22

K/A System: 295033 (High Secondary Containment Area Radiation Levels)

K/A Number: EK3.03 (Knowledge of the reasons for the following responses as they apply to High Secondary Containment Area Radiation Levels: ISOLATING AFFECTED SYSTEMS.)

K/A Value: 3.8/3.96

DAEC Objective: 95.68.08.01 For any given step, Caution, or Continuous Recheck Statement in EOP 3, explain the bases for the statement.

Cognitive Level: 3-SPK

Source: New Question

82. The plant is at full power during normal working hours.

While lowering a crate of highly radioactive material from the 5th floor, the sling breaks, causing the contents of the crate to spill out on the ground floor of the Reactor Building.

No one is injured but the Railroad Access ARM is alarming and reading 30 mR/hour.

The OSM takes or directs the following actions:

- Declares a Notification of Unusual Event HU-5, based on OSM judgement.
- Sounds the Evacuation Alarm.
- Makes a Plant Page announcement for all personnel to evacuate the Reactor Building.
- Repeats the Evacuation alarm and Plant Page announcement.

Which of the following is CORRECT concerning the OSM's compliance with the Emergency Plan.

- a. All of the OSM's actions have complied with the Emergency Plan.
- b. The entire plant must be evacuated when the Evacuation Alarm is used for an EAL declaration.
- c. An On-Site Rad Condition classification must be declared, not an HU-5 based on OSM judgement.
- d. The Evacuation Alarm is only used for EAL declarations of ALERT or greater, and may not be used for a Notification of Unusual Event.

ANSWER: b

Note: **Emergency Plan Implementing Procedure EAL Tables are provided.**

Distracter 1: Not per EPIP 1.3 In an EAL condition, the entire plant must be evacuated for accountability purposes.

Distracter 2: The only On-site rad condition NUE is AU2 which has entry condition of 1000X normal ARM reading and is therefore not applicable. There is no restriction for using HU5 on rad conditions.

Distracter 3: Evac alarm must be sounded for Alert or greater ,but may also be used for general evacuation or NUEs. Common misconception.

REFERENCE: EPIP 1.3

K/A System: GENERIC

K/A Number: 2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

K/A Value: SRO 3.3

DAEC Objective: SRO 3.01.03.01 Explain the responsibilities and instructions contained in EPIP 1.3 (Plant assembly and site evacuation)

Cognitive Level: 3-SPK

Source: New

83. Postulated scenario:

It is 0400 on a quiet midshift during normal full power operation. The STA's wife calls to tell him that she has gone into labor and that she must get to the hospital.

- At 0405, the STA departs as directed by the Operations Shift Manager (OSM).
- At 0410, the OSM calls the Operations Manager to inform him of the reduction in crew composition.
- At 0420, the OSM reaches a relief for the STA and directs him to come to work.
- At 0615, the STA relief arrives and joins in on the OSS/OSM turnover.
- At 0645, the STA shift turnover briefing is completed.

Which of the following is CORRECT concerning the operating crew's compliance with the shift manning requirements of ACP 1410.1, "Conduct of Operations", in the above postulated scenario?

- a. The operating crew has complied fully with the shift manning requirements of ACP 1410.1.
- b. The STA may NOT leave until the Plant Manager's permission is obtained.
- c. The STA may NOT leave until his relief has arrived on site and has been briefed.
- d. The STA position must be manned by a relief within two hours of the STA's departure.

ANSWER: d

Note: This question is based on a plant event and relatively recent change to ACP1410.1. Operations Manager must be notified, the position "manned", and the plant must be stable. These are all conditions satisfied in the postulated scenario except manning the watch in 2 hours. Manning the watch is not defined. It could mean arrival or it could mean completion of turnover briefing. In either case, the STA position was vacant for >2 hours.

Distracter 1: Did not comply because crew composition was reduced for >2 hours.

Distracter 2: Operations Manager required ; not Plant Manager. And it is not required beforehand.

Distracter 3: STA may leave under the stated conditions.

REFERENCE: ACP 1410.1; T.S. 5.2.2

K/A System: Generic

K/A Number: 2.1.4 (Knowledge of shift staffing requirements.)

K/A Value: SRO 3.4

DAEC Objective: SRO 1.01.01.01 Explain the crews responsibilities and authorities, the requirements, instructions and attachments of ACP1410.1 (Conduct of Ops)

Cognitive Level: 3-SPK

Source: NEW

84. A reactor startup is in progress per IPOI-2 "Startup".

- Reactor power is 16%.
- Operators are continuing control rod withdrawal.

Assume that the Rod Worth Minimizer (RWM) becomes inoperable at this point. Its mode switch must be taken to BYPASS.

In this situation, is the RWM required to be operable per Technical Specifications?
(REQUIRED or NOT REQUIRED)

If REQUIRED, correctly identify the Tech Spec REQUIRED ACTION.

If NOT REQUIRED, correctly identify why it is not required by Tech Specs.

- a. REQUIRED
Suspend control rod movement except by scram.
- b. REQUIRED
Verify movement of control rods is in compliance with Banked Position Withdrawal Sequence by a second licensed operator or other qualified member of the technical staff.
- c. NOT REQUIRED
The RWM is not required by Tech Specs when reactor power is greater than 10%.
- d. NOT REQUIRED
The RWM is not required by Tech Specs whenever The (reactor) Mode Switch is RUN.

ANSWER: c

Note: **DAEC Technical Specifications are provided.** The candidate must use a T.S. table to determine applicability, and table notes to identify other specified conditions, thereby demonstrating the ability to apply Tech Specs.

Distracter 1: Common misconception because Plant procedures require a second operator whenever the RWM is bypassed. Required Action is from RWM inop during startup, Condition C.

Distracter 2: Common misconception because plant procedures require a second operator whenever the RWM is bypassed. Required Action is verbatim from RWM inop Condition D which is N/A >10%.

Distracter 3: Not required is correct, but could be required in RUN if <10% power.

REFERENCE: Technical Specifications 3.3.2.1.D, IPOI 4

K/A System: GENERIC

K/A Number: 2.1.12 (Ability to apply Technical Specifications for a system.)

K/A Value: SRO 4.0

Objective: SRO 1.02.03.01 Explain the requirements of Conditions, Required Actions, and Completion Times, when entering planned and unplanned LCOs.

Cognitive Level: 3 SPR

Source: Revised, Exam Bank

85. During some fuel handling operations, a spent fuel bundle is dropped onto the reactor core and is damaged.

Annunciators 1C04B A-6, REACTOR BLDG ARM HI RAD and 1C03A A-1, FUEL POOL EXHAUST RIS-4131A/B HI-HI RAD, are alarming and the ANSOE reports the following readings:

Fuel Pool Exhaust, RIS-4131A:	15 mr/hr
Fuel Pool Exhaust, RIS-4131B:	2 mr/hr
North Refuel Floor, RI-9163:	110 mr/hr
South Refuel Floor, RI-9164:	115 mr/hr
Spent Fuel Pool Area, RI-9178:	118 mr/hr
New Fuel Vault Area, RI-9153:	90 mr/hr

Which one of the following is indicated by these readings, and what automatic actions are expected?

- RIS 4131B has failed. RIS 4131A should have started both trains of SBGT and isolated reactor building ventilation as part of a full Group III Isolation.
- RIS 4131B has failed. RIS 4131A should have started the "A" train of SBGT and isolated reactor building ventilation as part of a Div 1 Group III Isolation.
- RIS-4131B is slower to respond to the event because it is downstream of RIS 4131A. When it does respond, both trains of SBGT will auto start and reactor building ventilation will isolate as part of a full Group III Isolation.
- RIS-4131B is slower to respond to the event as a design feature to minimize spurious actuations. When it does respond, both trains of SBGT will auto start and reactor building ventilation will isolate as part of a full Group III Isolation.

ANSWER: b

Distractor 1: Only one monitor will cause half an isolation/auto start.

Distractor 2: The two detectors are not separated.

Distractor 3: The two detectors do not have different design response times.

REFERENCE: ARP 1C03A A-1, revision 4

K/A System: 295023 (Refueling Accidents)

K/A Number: AA2.01 (Ability to determine and/or interpret the following as they apply to Refueling Accidents: AREA RADIATION LEVELS.)

K/A Value: 3.6/4.0

DAEC Objective: 86.00.00.03 Evaluate plant conditions and control room indications to determine if the ARM System is operating as expected, and identify any actions that may be necessary to place the ARM System in the correct lineup.

Cognitive Level: 2-RI

Source: Exam Bank

86. New fuel has been loaded during a refueling outage.

Which of the following correctly describes how the new value of Shutdown Margin is determined at the DAEC?

- a. The only method used to establish Shutdown Margin is the analytical calculation performed by Reactor Engineers.
- b. Both an analytical calculation and confirmatory Surveillance Test Procedure are performed. This STP identifies the rod positions and other plant conditions at which the SRM counts increase by a factor of 10.
- c. Both an analytical calculation and confirmatory Surveillance Test Procedure are performed. This STP identifies the rod positions and other plant conditions at which the reactor achieves criticality.
- d. Both an analytical calculation and confirmatory Surveillance Test Procedure are performed. This STP identifies the rod positions and other plant conditions at which the reactor achieves 100% power.

ANSWER: c

Note: **Section 3.1.1 will be removed from the Tech Specs provided to SRO Candidates.**

STP 3.1.1-01 is performed every first startup per IPOI-1 to reduce uncertainties in the calculation.

Distracter 1:

Distracter 2: STP is performed but SDM is calculated using Critical data, not SRM counts. Plausible distracter because the factor of 10 increase value is the point at which notch withdrawal must begin.

Distracter 3: STP is performed but SDM is calculated using Critical data, not 100%. Plausible distracter because number of rods remaining partially inserted at full power.

REFERENCE: TS 3.1.1

K/A System: GENERIC

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

K/A Value: SRO 3.2*

Objective: SRO 4.23.01 Direct performance of applicable portions of IPOI-1 (Startup Checklist) attachments and checklists.

Cognitive Level: 1-F

Source: New Question

87. The Steam Tunnel and Reactor Building are equipped with blowout panels that relieve internal pressure when pressure exceeds 7"Hg.

What are the design bases for these blowout panels?

- 1) Steam Tunnel
 - 2) Reactor Building
- a.
 - 1) Prevent structural failure of the Steam Tunnel due to a steam leak in the Steam Tunnel.
 - 2) Prevent structural failure of the Reactor Bldg. due to a design basis Tornado.
 - b.
 - 1) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Steam Tunnel.
 - 2) Prevent structural failure of the Reactor Bldg. due to a design basis Tornado.
 - c.
 - 1) Prevent structural failure of the Steam Tunnel due to a steam leak in the Steam Tunnel.
 - 2) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Reactor Bldg.
 - d.
 - 1) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Steam Tunnel.
 - 2) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Reactor Bldg.

ANSWER: a

Distracter 1, 2, 3: Per UFSAR Chapter 3.3; The Reactor Building blowout panels protect the Reactor Building during the design tornado. Per UFSAR Chapter 3.6, Steam Tunnel blowout panels protect the Steam Tunnel not the Reactor Building.

REFERENCE: System Description 170.1, Secondary Containment, pages 5 and 6

K/A System: 295035 (Secondary Containment High Differential Pressure)

K/A Number: EK3.01 (Knowledge of the reasons for the following responses as they apply to Secondary Containment High Differential Pressure: BLOW-OUT PANEL OPERATION.)

K/A Value: 2.8/3.1

DAEC Objective: 50007.04.03

State the internal pressure limit for the Steam Tunnel and Refuel Floor Structure and explain how excessive pressure is managed.

Cognitive Level: 1 B

Source: New Question

88. See the partially completed page of IPOI-2 “Startup” on the next page of this exam.

A startup is in progress after a short duration maintenance outage.

A Drywell entry was NOT performed.

The next step of the startup is to withdraw control rods to establish one Turbine Bypass Valve 20%-90% open.

Assume that the attached page is the Working Copy of IPOI-2.

Which of the following CORRECTLY describes the placekeeping /logkeeping on the attached page?

- a. All steps have been properly documented per plant procedures?
- b. IPOI-2 steps may NOT be marked N/A (Not Applicable).
- c. The correction in step (b)1 was NOT performed properly.
- d. IPOI-2 steps may NOT be signed off using a check mark.

ANSWER: d

Note: Placekeeping with grease pencils on Operating Instructions and during Simulator training is a common practice. This question verifies that candidates recognize the stricter requirements for documenting IPOI steps. This requirement is in both references.

Distracter 1: The completed IPOI procedure steps are a permanent record and must therefore be initialed or signed per IPOI-2 and ACP-101.01.

Distracter 2: Steps may be marked N/A per ODI-022 and ACP 101.01

Distracter 3: Correction was performed perfectly per current rev of ODI 022. A recent concern has been that ALL corrections must be initialed, dated and timed. So as of the date of question development, the date and time are excessive, but not improper. If ODI-022 is revised, this answer option will still be in compliance.

REFERENCE: ODI-022, ACP-101.01

K/A System: GENERIC

K/A Number: 2.1.18 (Ability to make accurate, clear and concise logs, records, status boards, and reports.)

K/A Value: 2.9/3.0

Objective: 96.05 Conduct plant operations in accordance with Administrative Procedures

Cognitive Level: 3-SPK

Source: New Question

89. Which of the following is **NOT** a responsibility of the OSS in regards to processing a Temporary Document Change Form in accordance with ACP 106.1, "Procedure Preparation, Revision, Review, and Approval"?
- Ensure facility license is not violated.
 - Performing a Safety Evaluation.
 - Ensuring that the intent of the procedure is not changed.
 - Ensure that both the originator and procedure owner have signed within one working day.

ANSWER: b

Distracter 1: The OSS shall ensure facility license is not violated.

Distracter 2: The OSS shall ensure that the intent of the procedure is not changed by the DCF.

Distracter 3: The OSS shall ensure that both the originator and procedure owner have signed within one working day.

REFERENCE: ACP 106.1, "Procedure Preparation, Revision, Review, and Approval"

K/A System: GENERIC

K/A Number: 2.2.6 (Knowledge of the process for making changes in procedures as described in the Safety Analysis Report.)

K/A Value: 2.3/3.3

Objective: SRO 1.11.02.08

Explain the OSS's responsibilities regarding ACP 106.1, Procedure Preparation, Revision, Review and Approval.

Cognitive Level: 1 F

Source: New Question

90. See the attached RPV instrumentation schematic of 1C56 on the next page.

Given:

- PI-4553 provides indication only.
- PS-4549 provides a protective function.

Are there any prerequisite conditions for venting PI-4553 based on its instrument line connections ? (NO Conditions or SOME Conditions)

If there are SOME prerequisite conditions for venting PI-4553 based on its instrument line connections, are they:

MORE Restrictive,

LESS Restrictive,

or the SAME Restrictions

when compared to PS-4549?

- a. PI-4553 can be vented with NO restrictions.
- b. SOME prerequisite conditions.
MORE Restrictive than PS-4549.
- c. SOME prerequisite conditions.
LESS Restrictive than PS-4549.
- d. SOME prerequisite conditions.
The SAME Restrictions as PS-4549.

ANSWER: D

REFERENCE: ACP 1410.1 Conduct of Ops, Section 3.9 (8)-(11); SD 880

Note: Question is based on a plant event. PS-4549 provides high pressure scram signal. However, the point of the question is that both instruments share a common instrument leg with instruments that have protective functions and thus require an approved procedure.

Distracter 1, 2, & 3: Both require OSS/OSM concurrence and an approved procedure because they are on the same sensing line.

K/A System: 2.1

K/A Number: 2.1.1 (Knowledge of Conduct of Operations requirements.)

K/A Value: 3.7/3.8

Objective: Industry Events

Cognitive Level: 3-SPK

Source: Revised, Exam Bank

91. Which of the following CORRECTLY describes the purpose of the End of Core Life Recirc Pump Trip (EOC-RPT) logic?

The purpose of the EOC RPT trip is to...

- a. rapidly shutdown the reactor in the event of an ATWS.
- b. rapidly shutdown the reactor when MAPRAT is the greatest.
- c. mitigate the core-wide pressurization transient caused by a Group 1 isolation.
- d. reduce the severity of the thermal transient caused by a turbine trip without bypass.

ANSWER: d

Distracter 1: This shutdown would be the ATWS-ARI trip

Distracter 2: The thermal limit of concern is MCPR.

Distracter 3: The MSIV closure pressure transient would be mitigated by SRVs.

REFERENCE: SD 264

K/A System: GENERIC

K/A Number: 2.1.28 (Knowledge of the purpose and function of major system components and controls.)

K/A Value: 3.2/3.3

Objective: 12.00.00.03c

Describe the operation of the following principle Recirc System components: RPT BREAKERS.

Cognitive Level: 1 B

Source: Exam Bank

92. The plant is at 95% power. Due to heavy flooding upstream, the river has had excessive amounts of debris.

The Trash Rake has been used several times to clear the Trash Bars.

The "A" RWS pump is running.

The NSPEO reports from the Intake Structure that there is a large tree hung up on the Trash Bars.

About 3 minutes later annunciator 1C06A, A-1 "A" RWS PIT LO LEVEL comes in, followed shortly by annunciator 1C06A, A-2 "B" RWS PIT LO LEVEL.

The NSPEO reports that the Trash Bars are clogging rapidly and the flow of river water into the pits has stopped.

What would be the appropriate initial response under these conditions?

- a. Manually scram the reactor.
- b. Attempt to start standby pumps in both RWS Subsystems.
- c. Line up the sand jets and or use fire hoses to clear the debris.
- d. If either "A" or "B" RHRSW/ESW PIT LO LEVEL annunciators come in, scram the reactor.

ANSWER: a

REFERENCE: AOP 410

Distracter 1, 2, & 3: Flow of water into RWS suction pits indicates a complete loss of RWS, which calls for an immediate manual reactor scram.

K/A System: GENERIC

K/A Number: 2.4.11 (Knowledge of abnormal condition procedures.)

K/A Value: SRO 3.6

Objective: SRO 5.15.01 Direct operators to perform the immediate actions of AOP 410 (Loss of RWS)

Note: This event has a 5% risk ranking of initiating events by contribution to total core damage frequency (PRA).

Cognitive Level: 1-P

Source: Bank

93. The plant is operating at full power. The A Core Spray pump breaker has been racked out and tagged out for an oil change on the pump motor. After the hold card was cleared, the operators performed the following sequence of actions:

The NSPEO racked up the breaker.

The NSPEO verified that the contact GAP for the auxiliary switch was acceptable.

The NSPEO placed the RAISE-LOWER switch in the neutral position and properly stored the elevating motor.

The Control Room operators verified the A Core Spray pump indicating lights; green and white ON and red OFF.

The Control Room operators successfully start the A Core Spray pump.

The Control Room operators then stop the A Core Spray pump.

Assume that the OSS is standing by with the Work Request in his hand and ready to declare the A Core Spray pump operable. At which point in this sequence can the Limiting Condition for Operation (LCO) be exited?

The LCO can be exited as soon as ...

- a. the breaker has been racked up.
- b. the contact GAP has been verified acceptable.
- c. the Control Room operators have verified the A Core Spray pump indicating lights at 1C03.
- d. the Control Room operators have successfully started and stopped the A Core Spray pump.

ANSWER: d

Distracter 1, 2, & 3: The breaker requires testing to prove its operability. It must be closed in , not just racked in .

REFERENCE: ACP 1410.2, OI-304.2

K/A System: GENERIC

K/A Number: 2.2.23 (Ability to track limiting conditions of operation.)

K/A Value: 2.6/3.8

Objective: 15.01.01.01

Cognitive Level: 3-SPK

Source: NEW

94. At the Remote Shutdown Panel 1C388, there are controls for the B Loop RHRSW.

- 1) Are the RHRSW controls a REQUIRED FUNCTION or NOT a REQUIRED FUNCTION for the operability Remote Shutdown System per Technical Specification 3.3.3.2 ?
- 2) Identify the correct reason for the answer to Part 1 of this question.
 - a. 1) REQUIRED FUNCTION
2) RHRSW is required for the CONTAINMENT CONTROL function of the Remote Shutdown System.
 - b. 1) REQUIRED FUNCTION
2) RHRSW is required for the DECAY HEAT REMOVAL function of the Remote Shutdown System.
 - c. 1) NOT a REQUIRED FUNCTION
2) RHRSW is NOT required for the RPV INVENTORY CONTROL function of the Remote Shutdown System.
 - d. 1) NOT a REQUIRED FUNCTION
2) RHRSW is NOT required for the RPV PRESSURE CONTROL function of the Remote Shutdown System.

ANSWER: b

Distracter 1: There is no containment control function of the RSP.

Distracter 2: RHRSW controls are a required function, if not necessarily for RPV inventory control.

Distracter 3: RHRSW controls are a required function, if not necessarily for RPV pressure control.

REFERENCE: T.S. Bases B3.3.3.2 & Table 3.3.3.2-1

K/A System: GENERIC

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

K/A Value: SRO 3.7

Objective: SRO 1.11.01.01 Explain the contents of each section of Technical Specifications and their associated bases.

Cognitive Level: 1B

Source: New Question

95. Which of the following is **NOT** an example of SOURCE TERM REDUCTION as defined by ACP 1411.1, "The ALARA Emphasis Program"?
- a. The Scram Discharge Volume was wrapped with lead blankets.
 - b. The area around the CRD Discharge Filter was decontaminated.
 - c. The floor drain of the CRD Repair Room was flushed to remove a hot spot.
 - d. The stellite rollers on the control rods were replaced to reduce cobalt in the reactor coolant system.

ANSWER: a

Note: STR= "Systematic application of principles used to remove and/or avoid the buildup of radioactive material in a system which contribute significantly to occupational exposure." Correct answer may be an example of shielding or ALARA but not of STR.

STR is listed with time, distance, and shielding as ALARA principles. It is operationally valid for candidate to understand its definition.

Distracter 1, 2, & 3: ACP 1411.1 uses these activities as examples of STR.

REFERENCE: ACP 1411.1, The ALARA Emphasis Program; OI-878.6 TIP

K/A System: GENERIC

K/A Number: 2.3.2 (Knowledge of facility ALARA program.)

K/A Value: 2.5/2.9

Objective: GET Objective

Cognitive Level: 1 D

Source: NEW

96. ACP 14.11.17 is “Occupational Dose Limits and Upgrades”. It sets the DAEC administrative radiation exposure limits for routine operations and identifies which managers can authorize upgrades to higher limits.

It also sets a maximum exposure limit for routine operation during any calendar year. No one has been given the authority to upgrade past this limit.

Which of the following is that exposure limit?

- a. 3.0 rem TEDE
- b. 3.5 rem TEDE
- c. 4.0 rem TEDE
- d. 4.5 rem TEDE

ANSWER: d

Note: SRO titles at DAEC are “Operations Shift Supervisor” and “Operations Shift Manager”.

Distracter 1: The limit above which requires First Manager permission.

Distracter 2: Plausible and homogeneous distracter.

Distracter 3: The limit above which requires Department Manager permission.

REFERENCE: ACP 1411.17, Occupational Dose Limits and Upgrades.

K/A System: GENERIC

K/A Number: 2.3.4 (Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.)

K/A Value: SRO 3.1

Objective: GET Objective

Cognitive Level: 1-F

Source: New

97. The plant is at 30% power and being shutdown for a Drywell entry to find the cause of increased floor drain leakage.

Operators were about to commence an air purge (de-inerting) of the containment when both Offgas Stack Radiation Monitors, RM-4116A&B, became INOPERABLE, as indicated by Annunciator 1C03A, C-4, OFFGAS VENT PIPE RM-4116A/B RAD MONITOR DNSCL/INOP.

KAMAN 9 and 10, Offgas Stack KAMAN monitors, remain operable.

May the other operators begin de-inerting while RM-4116A&B are not operable?
(DE-INERTING MAY NOT BEGIN or MAY BEGIN)

If MAY NOT BEGIN, identify the correct reason why not.

If MAY BEGIN, identify the correct compensatory measures that must be taken.

- a. DE-INERTING MAY NOT BEGIN
There would be NO Group 3 isolation from the RM-4116A&B inoperability.
However, containment venting in this situation would be an unmonitored release.
- b. DE-INERTING MAY NOT BEGIN
A Group 3 isolation would be in effect due to RM-4116A&B inoperability.
This would not allow containment venting.
- c. DE-INERTING MAY BEGIN
A Group 3 isolation would be in effect due to RM-4116A&B inoperability.
Operators may override the Group 3 isolation with the keylock switches on 1C04 and begin containment venting.
- d. DE-INERTING MAY BEGIN
There would be NO Group 3 isolation from the RM-4116A&B inoperability.
Operators may establish administrative control over the containment vent valve controls with continuous monitoring of alternate instrumentation.

ANSWER: d

Note: This question is based on a plant event in which a Work Order was planned incorrectly due to lack of knowledge of this requirement. Tech Spec provided to SRO candidates. Candidate must also know that RM-4116A&B inoperability is not a Group 3 isolation signal. Answer is also available in Tech Specs.

Distracter 1: Allowed by OI-573 P&L 12. Release would still be monitored by Offgas Stack KAMAN.

Distracter 2: Allowed by OI-573 P&L 12. Upscale trips from these rad monitors is a group 3 but not inop.

Distracter 3:Upscale trips from these rad monitors is a Group 3 but not inop. Overrides would not be necessary.

REFERENCE: OI-573; 1C03A, C-4; Tech Spec 3.3.6.1

K/A System: GENERIC

K/A Number: 2.3.9 (Knowledge of the process for performing a containment purge.)

K/A Value: SRO 3.4

Objective: SRO 1.02.03 Declare and instrument, component, or system inoperable ,enter the correct condition. If applicable, determine and direct the performance of the required SRs.

Cognitive Level: 3-SPR & SPK

Source: New Question

98. In which of the following documents are the OPERABILITY REQUIREMENTS found for Electric and Diesel Fire pumps (1P-48 & 1P-49)?

OPERABILITY REQUIREMENTS for Electric and Diesel Fire pumps are found in ...

- a. the DAEC Fire Plan.
- b. the Technical Specification Bases.
- c. the DAEC Technical Requirements Manual.
- d. Administrative Control Procedure (ACP) 1412.4 "Impairments to Fire Protection Systems".

ANSWER: a

Note : Tech Specs are not good answer option because they are provided with SRO Exam.

Distracter 1: A great deal of information was moved from TS to TS Bases. Bases documents have sections for "Operability Requirements", which provide bases for Op Reqs but not the Op Reqs themselves. Fire system Op Reqs are not included.

Distracter 2: TRM is very similar to Tech Specs and a viable place to find Operability Requirements.

Distracter 3: ACP 1412.4 lists compensatory measures when Fire system equipment is impaired , but not Operability Requirements.

REFERENCE: DAEC Fire Plan

K/A System: GENERIC

K/A Number: 2.4.25 (Knowledge of Fire Protection procedures.)

K/A Value: SRO 3.4

Objective: 2.02.02.05 Demonstrate the ability to read and interpret Att. 3, 4, & 5 and the DAEC Fire Plan operability requirements.

Cognitive Level: 1-F

Source: New

99. The RHR System was placed in the Shutdown Cooling mode during a normal shutdown. Cooldown has progressed to the point that the head vents have been opened.

Shortly after that, a Group 4 Isolation results in the loss of Shutdown Cooling. The OSS directs you to monitor panel 1C05 while the rest of the operating crew investigates.

Several annunciators are alarming. As you scan the annunciator panels from your station at 1C05, you can see a rapidly flashing annunciator on the EOP ANNUNCIATORS panel, 1C14.

The annunciator window has a WHITE lens but you are too far away to read the wording on the annunciator window.

Could this be a high priority annunciator?

- No; All high priority annunciators have either a blue or red lens.
- No; All annunciators on this panel are for EOP Defeats (overrides). The alarming condition must be the result of an operator action taken in response to this event.
- Yes; The annunciator could be a high area WATER LEVEL EOP-3 entry condition.
- Yes; The annunciator could be a high area TEMPERATURE EOP-3 entry condition.

ANSWER: c

Note: Group 4 isolations are: Low RPV Level <170", High DW Pressure <2#, and High RPV pressure, >135 psig. With the head vents open, the Group 4 must have been caused by low RPV level.

Distracter 1: Not all EOP entry conditions have colored lenses. On 1C14, area water levels above Max Normal and Max Safe are white lenses.

Distracter 2: 22 of 24 are for EOP defeat annunciation, but this panel also includes, and is the only place for, Area Water Level alarms. Also, there are no applicable EOP defeats to be installed at the onset of Group 4 isolation due to Low RPV level.

Distracter 3: Hi Area Temps is an EOP-3 entry condition, but the Steam Leak Detection annunciator is on panel 1C04B.

REFERENCE: ARP 1C14A & B; 1C04B; EOP-3; ACP1410.1

K/A System: GENERIC

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

K/A Value: 3.3/3.6

Objective: 1..04.16.02 (Explain the Control Room Operators responsibilities when receiving and acknowledging an annunciator per ACP1410.1.)

Cognitive Level: 3-SPK

Source: New Question

100. The plant has experienced an accident that required an entry into EOP 3. One area had exceeded its Max Safe Operating Limit for temperature and another had exceeded its Max Normal Operating Limit for temperature and was still rising.

The OSS, anticipating ED, directed the BOP operator to Rapidly Depressurize the RPV with the Turbine Bypass valves.

The BOP operator went to the 1C07 Panel and performed the following actions without the procedure in hand:

Verified an EHC pump running.

Determined the Main Condenser was available.

Depressed and Held the Bypass Valve Opening Jack Selector "INCREASE" Pushbutton until both Bypass Valves were full open.

Which of the following CORRECTLY describes the operator actions in the above postulated scenario?

- The operator is allowed to perform this procedure from memory and has performed it correctly.
- The operator is NOT allowed to perform this procedure from memory.
- The operator is required to start the second EHC pump before opening the Bypass Valves.
- The operator is required to depress the test pushbutton for the # 1 Bypass Valve while the Opening Jack "INCREASE" pushbutton is held.

ANSWER: a

Distracter 1, This is an "Immediate Operator Action" procedure per ACP 1410.1.

Distracter 2, Only one EHC pump is required.

Distracter 3: The test pushbutton is not required, but may be used to expedite the evolution to open the #2 BPV not the #1 BPV.

REFERENCE: ACP 1410.1, Section 3.7(10)

K/A System: GENERIC

K/A Number: 2.4.49 (Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.)

K/A Value: 4.0/4.0

Objective: 96.05.02.21 and 96.05.02.22

Explain the guidance for Operations Procedure Use and Adherence contained in ACP 1410.1. AND List the activities that an RO should be able to perform from memory as listed in Attachment 3 of ACP 1410.1.

Cognitive Level: 3-SPK

Source: New Question