Duane Arnold Energy Center

Reactor Operator

50007

Topic: 2001 ILC RO Written Exam

Rev. 1

DEVELOPED BY: _____ _____
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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 Point

1. While performing the Control Rod Drift Alarm Test, when does the Rod Drift annunciator 1C05A, D-6 activate?

   a. when the rod being tested is selected

   b. when the rod being tested is inserted

   c. when the rod being tested is withdrawn

   d. when the ROD DRIFT ALARM TEST/RESET switch is taken to the TEST position

ANSWER: b

Distracter 1, 2, 3: Per OI-856.1 page 16, the Rod Drift annunciator activates when the control rod is inserted one notch

REFERENCE: OI-856.1, Reactor Manual Control System, page 16

K/A System: 201002 (Reactor Manual Control System)

K/A Number: A4.03 (Ability to manually operate and/or monitor in the control room: ROD DRIFT TEST SWITCH.)

K/A Value: 2.8/2.8

DAEC Objective: 72.00.00.02

Describe the operation of the following principle Reactor Manual Control System components: ROD DRIFT ALARM CIRCUIT.

Cognitive Level: 1 P

Source: New Question

2. The reactor Mode Switch is in REFUEL during refueling operations.

   APRM A is BYPASSED.

   All SRMs and IRMs are operable and NOT BYPASSED.

   Which of the following CORRECTLY describes the response of the Reactor Protection System (RPS) if the mode switch on the 1C36 drawer for A IRM were to be taken to the STANDBY position?

   a. A half scram would result due to an inoperable IRM.

   b. A half scram would result due to an inoperable IRM with companion ARPM downscale.

   c. There would be NO CHANGE to RPS because A IRM remains operable in STANDBY.

   d. There would be NO CHANGE to RPS because the reactor Mode Switch is in REFUEL.

ANSWER: a

Distractor 1: Companion APRM has no affect in refuel.

Distractor 2: Mode switch out of operate makes IRM INOP and results in a ½ scram.

Distractor 3: IRMs only bypassed in RUN.

REFERENCE: SD-878.2

K/A System: 215003 IRM

K/A Number K3.01 (Knowledge of the effect that a loss or malfunction of IRM on RPS.)

K/A Value: 3.95/4.0

DAEC Objective: 79.00.00.06

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

1 Point

4. With the "A" Loop of RHR in Shutdown Cooling, the following annunciators were received:

1C03B, A-5, LPCI HI DRYWELL PRESS

then:

1C03B, A-2, "A" RHR PUMP 1P-229A TRIP
1C03B, A-3, "C" RHR PUMP 1P-229C TRIP
1C03B, D-4, "A/B" RHR HX RHR INLET HI TEMP

Drywell pressure is 3 psig
RHR Hx inlet temperature is 350°F

What was the reason for the RHR pump trips?

a. prevent RHR pump damage due to cavitation caused by a loss of NPSH

b. prevent water hammer to piping when the RHR pumps try to auto start

c. prevent overpressurization of the low pressure Shutdown Cooling piping

d. prevent a thermal shock to the vessel due to injection of cold water from the torus when the RHR pumps auto start

ANSWER: a

Distracter 1: RHR Pump breakers will not close in due to the suction path interlock.

Distracter 2: The Group 4 Isol signal 135 psig does this function.

Distracter 3: RHR Pump breakers will not close in due to the suction path interlock.
RHR pump Suction valves do not automatically open

REFERENCE: ARP 1C03B A-2/A-3, 1C05B D-8 Group 4 Isolation

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

K/A Number: K4.06 Knowledge of the RHR/LPCI Injection Mode design feature(s) and/or interlocks which provide for the following: ADEQUATE PUMP NET POSITIVE SUCTION HEAD (INTERLOCK SUCTION VALVE OPEN).

K/A Value: 3.5/3.5

DAEC Objective: 2.03.01.04

Describe the RHR System interlocks, including purpose, setpoints, logic, and when/how they are bypassed, overridden, or reset.

Cognitive Level: 1 I

Source: New Question

1 Point

5. As the following equipment becomes unavailable, the margin to the MCPR Safety limit becomes less during certain transients.

   The initial operator response to three of these conditions is a recalculation and possible adjustment of the Operating Limit MCPR. (Assume that recalculations and/or adjustments can be made within two hours). One condition requires the reduction of reactor power to less than 25% within 4 hours.

   Which condition requires the power reduction to less than 25%?

   a. One Turbine Bypass Valve out of service.

   b. Two Turbine Bypass Valves out of service.

   c. One EHC pressure regulator out of service.

   d. One Recirc Pump Trip (RPT) channel out of service.

ANSWER: c

Note: Margin to MCPR becomes unknown with pressure regulator OOS; P&L requires <25% in 4 hours.

Distracter 1: Requires OLMCPR recalculations and/or adjustments.

Distracter 2: Requires OLMCPR recalculations and/or adjustments.

Distracter 3: Requires OLMCPR recalculations and/or adjustments.

REFERENCE: OI-693.1 P&Ls; COLR; T.S. 3.2

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

K/A Number: 2.1.10 (Knowledge of the conditions and limitations in the facility license.)

K/A Value: 2.7/3.9

DAEC Objective: 51.01.01.02 (Relate the P&Ls, operating cautions, or procedural notes of OI-693.1 and any applicable ARPs to any component or Main Turbine system operating status.)

Cognitive Level: 1-P

Source: New Question

1 Point

6. EOP-2, Primary Containment Control, directs the operator to secure HPCI if torus water level cannot be maintained above 5.8 feet. No instruction concerning securing RCIC is included. Which ONE of the following describes the reason for securing HPCI and not RCIC?

a. Torus level less than 5.8 feet could result in cavitation of the HPCI pump, but RCIC suction is lower in the torus.

b. HPCI operation rapidly reduces torus level below the relief valve spargers, where RCIC flow has less significant effect.

c. The swirling action set up by HPCI suction at low level would cause torus failure, where RCIC low flow causes no problem.

d. HPCI continued operation could overpressurize the containment, where RCIC steam load is approximately that of decay heat.

ANSWER: d

Distracter 1, 2, 3: The bases for securing HPCI at Torus Water level of 5.8 feet is based on overpressurization of containment as per EOP Bases Document, EOP 2, page 21.

REFERENCE: EOP Bases Document, EOP 2, page 21

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

K/A Number: K1.16 (Knowledge of the physical connection and/or cause–effect relationships between High Pressure Coolant Injection and the following: CONTAINMENT/TORUS PRESSURE.

K/A Value: 3.5/3.5

DAEC Objective: 95.00.00.18

Evaluate the consequences of exceeding any EOP Curve or Limit on the mitigation of an event.

Cognitive Level: 1 B

Source: Exam Bank

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

1 Point

8. Which of the following Core Spray pressure annunciators/indications describe the operator's indication that a leak has occurred in the Core Spray piping BETWEEN THE REACTOR VESSEL AND CORE SHROUD?

   a. Core Spray Sparger HI Δ P (3.6 psig increasing)

   b. Core Spray Sparger LO Δ P (2.46 psid decreasing)

   c. Core Spray Discharge line low pressure (47.5 psig decreasing)

   d. Core Spray Discharge line high pressure (100 psig increasing)

ANSWER: b

Distracter 1: Common misconception that Δ P goes up. Break detection alarms at 2.46 psid decreasing

Distracter 2: Indicates a leak but not in the described location.

Distracter 3: Possible misconception that described leak pressurized CS discharge header.

REFERENCE: ARP 1C03A; SD-151

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

K/A Number: A1.02 (Ability to predict and/or monitor changes in parameters associated with operating the Low Pressure Core Spray System controls including: CORE SPRAY PRESSURE.)

K/A Value: 3.2/3.4

DAEC Objective: 4.01.01.02Evaluate plant conditions and control room indications to determine if the Core Spray System is operating as expected, and identify any actions that may be necessary to place the Core Spray System in the correct lineup.

Cognitive Level: 1-I

Source: Bank

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.

   a. The SBLC system has initiated properly.

   b. The SBLC system has NOT initiated properly because system flow would be greater than 56 gpm.

   c. The SBLC system has NOT initiated properly because the Squib valve continuity loss annunciator would not be activated.

   d. 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 INITATION signal.
Cognitive Level: 1 I
Source: New Question

1 Point

10. The plant is less than 75% power as directed by STP 3.3.1.1-19 “Functional Test of TSV Closure Input to RPS and RPT”. (Routine turbine testing)

    Per this procedure, both pushbuttons for Turbine Stop Valve 1 and 2, in RPS Channel A1, are simultaneously depressed and then released when the TSVs reach 90% open.

    Which of the following CORRECTLY describes the response of the Reactor Protection System to this test?

    a. The RPS system is DESIGNED for ½ scrams during this type of testing and the action described would result in a ½ scram.

    b. The RPS system is DESIGNED for ½ scrams during this type of testing however, the action described would NOT result in a ½ scram.

    c. The RPS system is NOT DESIGNED for ½ scrams during this type of testing.
    I&C Technicians must install relay blocks in the appropriate RPS relays at the beginning of this section of the STP.

    d. The RPS system is NOT DESIGNED for ½ scrams during this type of testing.
    The ½ scram is inhibited when the “A” RPT System Mode Select Switch, C71A-S12A, on 1C15, is placed in TEST at the beginning of this section of the STP.

ANSWER: a

Note: ILC candidates perform this STP as part of their training. It is one of the few times that they do test that result in ½ scrams.

Distracter 1: TSV 1 & 2 testing produces a ½ scram.

Distracter 2: RPS is designed for ½ scrams during testing. This is a functional test performed by operators. It does not require I&C Techs who would be responsible for installing relay blocks.

Distracter 3: RPS is designed for ½ scrams during testing. This may be an obscure test switch but candidate should recognize that the plant is designed to take ½ scrams during testing but not ½ RPT trips.

REFERENCE: STP 3.3.1.1-19 and SD-358

K/A System: 212000 (Reactor Protection System)

K/A Number: K4.05 (Knowledge of the Reactor Protection System design feature(s) and/or interlocks which provide for the following: FUNCTIONAL TESTING OF THE SYSTEM WHILE MAINTAINING POWER OPERATION.)

K/A Value: 3.4/3.6

DAEC Objective: 22.02.01.08Describe the Reactor Protection System interlocks, including purpose, setpoints, logic, and when/how they are bypassed.
Also Task 97.04, Perform TSV closure RPS and RPT Functional.

Cognitive Level: 1 I

Source: New Question

1 Point

11. Assume that the plant is in a normal lineup and that all systems respond as designed.

    The following Nuclear Instrumentation conditions exist:

    - The plant is at 10% power with the Mode Switch in STARTUP/HOT STANDBY.
    - All four SRMs are reading 1x10 E5
    - IRM "B" is reading 118 on the 125 scale
    - APRM "E" has 9 LPRM inputs

    Which of the following CORRECTLY describes the affect of the above conditions on the Reactor Protection System?

    a. No scram

    b. Full scram

    c. Half scram on "A" RPS

    d. Half scram on "B" RPS

ANSWER: c

Note: APRM E has too few inputs and would be inop, resulting in a ½ scram on "A" RPS. SRM upscales are not a RPS trip. "B" IRM is below the trip set point of 120/125

Distracter 1: ½ scram on "A" RPS.

Distracter 2: There is no scram signal for the "B" RPS system.

Distracter 3: There is no scram signal for the "B" RPS system..

REFERENCE: SD 358 and 878.1, 2,& 3

K/A System: 212000 (Reactor Protection System)

K/A Number: K6.02 (Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Protection System: NUCLEAR INSTRUMENTATION.)

K/A Value: 3.7/3.9

DAEC Objective: 22.00.00.08

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

Cognitive Level: 2 RI

Source: Exam Bank

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

1 Point

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.

    a. The reactor startup and heatup can continue with a 1/2 scram on the “A” RPS channel.

    b. The reactor startup and heatup cannot continue because of an IRM DOWNSCALE rod block.

    c. The reactor startup and heatup can continue with the IRM DOWNSCALE annunciator activated.

    d. 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

1 Point

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?

    a. 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.

    b. 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.

    c. 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.

    d. 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

1 Point

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

1 Point

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

1 Point

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?

    a. Manually insert a full scram.

    b. Place "C" APRM mode switch in STANDBY.

    c. Insert a backup manual half scram on the "A" RPS channel.

    d. 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

1 Point

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: 88.00.00.02Describe 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

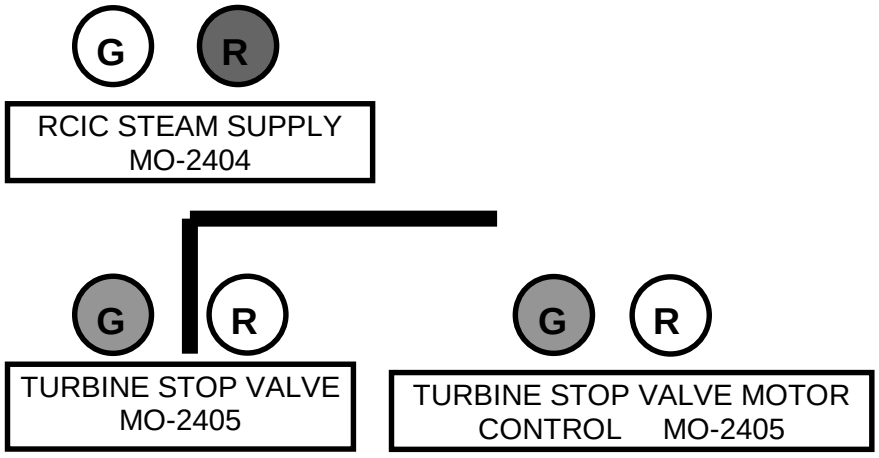
1 Point

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. A RCIC Auto Isolation trip has occurred.
The RCIC Turbine trip is RESET.

b. A RCIC High RPV Level trip has occurred.
The RCIC Turbine trip is RESET.

c. A RCIC Electrical Overspeed trip has occurred.
The RCIC Turbine trip is NOT RESET.

d. 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: 3.02.01.05Evaluate 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

1 Point

20. Following a LOCA, the following conditions exist:

All control rods are fully inserted
Reactor water level 115″
Reactor pressure 50 psig

Drywell pressure 25 psig
Torus pressure 25 psig
Torus water level 12 ft

"A" and "B" Core Spray pumps are not available.
All other systems worked as designed.
The Shift Supervisor has directed you to continue to depressurize the RPV using the ADS SRVs.

Which of the following is correct concerning the use of the ADS SRVs?

a. The ADS SRVs WILL open and can be used without any restrictions.

b. The ADS SRVs WILL open and can be used until Torus water level reaches 13.5 ft.

c. The ADS SRVs WILL NOT open because the Core Spray pumps are not running.

d. The ADS SRVs WILL NOT open because the RPV to Torus differential pressure is too low.

ANSWER: d

Note: All SRVs need ≈50 psid to actuate.

Distracter 1: Will not open due to low ΔP. Otherwise there would be no restriction.

Distracter 2: Will not open due to low ΔP. Torus Level breakpoint is for vacuum breaker operation, not SRVs

Distracter 3: Selected if candidate is confused about ADS auto initiation, which needs either CS or RHR pumps running. According to stem, RHR would be running. And question is asking for manual ADS operation.

REFERENCE: SD-683

K/A System: 218000 (Automatic Depressurization System)

K/A Number: K1.04 (Knowledge of the physical connections and/or cause-effect relationships between the Automatic Depressurization System and the following: DRYWELL/CONTAINMENT PRESSURE.)

K/A Value: 3.9/4.2

Objective: 8.01.01.02Given an ADS System operating mode and various plant conditions, predict how the ADS System will be impacted by failures in the following support systems: PRIMARY CONTAINMENT SYSTEM.

Cognitive Level: 2 RI

Source: New Question

1 Point

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

1 Point

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

1 Point

23. Core alterations are in progress during a refueling outage.

For a given DEFUELED CELL, which of the following is the **LEAST** PREFERRED lineup for the Control Rod and Hydraulic Control Unit?

a. A Blade Guide is in place.
The control rod is fully INSERTED.
One CRD pump is OPERATING.
The Cooling Water valve is OPEN at the HCU.

b. A Blade Guide is NOT in place.
The control rod is fully WITHDRAWN.
One CRD pump is OPERATING.
The Cooling Water valve is OPEN at the HCU.

c. A Blade Guide is NOT in place.
The control rod is fully WITHDRAWN.
One CRD pump is OPERATING.
The Cooling Water valve is CLOSED at the HCU.

d. A Blade Guide is NOT in place.
The control rod is fully WITHDRAWN.
Condensate Service (flushing) water is valved in because both CRD pumps are SECURED.
The Cooling Water valve is OPEN at the HCU.

ANSWER: b

Note: Plant Priority; DAEC will begin a refueling outage shortly after this ILC exam.
"Least preferred" sounds subjective, but it clearly defined by the P&L.

Distracter 1: Rod is already in and supported, so it cannot drift in and cause damage.

Distracter 2: This sounds bad because there is no cooling or flushing going on, but it is preferred to setting up to have the rod drift in.

Distracter 3: This is a rarely used lineup but it is proceduralized in OI-255 (CRD) specifically for this situation. Rods cannot be drifted in with Condensate Service water.

REFERENCE: OI-255, P&L 13

K/A System: 201001 (CRD Hydraulic)

K/A Number: 2.2.27 (Knowledge of the refueling process)

K/A Value: 2.6/3.5

Objective: 10.01.01.02 (Relate the applicable CRD precautions and limitations in OI-255 to a give plant, system, or component operating status…)

Cognitive Level: 3-SPK

Source: NEW

1 Point

24. The operating crew has entered EOP 2 on low Torus water level and are required to Emergency Depressurize.

    EOP 1 has been entered and a manual scram inserted. IPOI 5 actions have been performed.

    The 1C05 operator is controlling feedwater in MANUAL and RPV water level at 190″.

    What initial feedwater flow rate into the RPV will compensate for the steam flow through the SRVs during the Emergency Depressurization? (Assume 4 ADS SRVs open.)

    a. 1.6 Mlbm/hr

    b. 2.4 Mlbm/hr

    c. 3.2 Mlbm/hr

    d. 4.0 Mlbm/hr

ANSWER: c

Distracter 1, 2, 3: Design flow rate of the SRVs is 800,000 lbm/hr at 1125 psid, 4 SRVs are required to ED however reactor pressure should be approximately 940 psig and the flow rate would be slightly less than 3.2 Mlbm/hr. The operator is directed to maintain 170″ to 211″. Distractors are design flow rates for 2, 3, and 5 SRVs.

REFERENCE: System Description 183.1, Automatic Depressurization System and Low-Low Set System, page 8

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

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

K/A Value: 3.9/4.1

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 by personnel outside of the control room.

Cognitive Level: 3 SPK

Source: New Question

1 Point

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

1 Point

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

1 Point

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

1 Point

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

1 Point

30. The 1C05 operator initiates a control rod movement and observed the following indications:

CRD Drive Water flow on 1C05 indicated 4 gpm then dropped to 2 gpm.

Which of the following explains this sequence of flow rates?

a. The 4 gpm is the flow rate required to overcome the friction of the seals during an insertion of the control rod and the 2 gpm is stall flow.

b. The 4 gpm is required to spread the collet fingers so that they will ratchet along the index tube during the control rod insertion and the 2 gpm is the flow rate required for the control rod insertion.

c. The 4 gpm is the required withdrawal flow rate for the control rod and the 2 gpm is required to spread the collet fingers so that they can ratchet along the index tube during the control rod withdrawal.

d. The 4 gpm is insertion flow rate to lift the weight of the index tube and control rod off the collet fingers so that they can be cammed out of the locking notch and the 2 gpm is the flow rate required for the control rod withdrawal.

ANSWER: d

Distracter 1: 4 gpm is required to insert the control rod and 2 gpm is required to withdraw the control rod. Stall flow is less than 1 gpm.

Distracter 2: The collet fingers ratchet along the index tube during insertion and are forced out during withdrawal.

Distracter 3: 4 gpm is required to insert the control rod and 2 gpm is required to withdraw the control rod. The collet fingers ratchet along the index tube during insertion and are forced out during withdrawal.

REFERENCE: System Description 255, CRD Mechanisms and Hydraulic System, page 21

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

K/A Number: K4.07 (Knowledge of the Control Rod Drive Mechanism System design feature(s) and/or interlocks which provide for the following: MAINTAINING THE CONTROL ROD AT A GIVEN POSITION.)

K/A Value: 3.2/3.2

Objective: 10.07.01.05

Describe the construction and operation of the CRD Mechanism including the following components: DRIVE PISTON and INDEX TUBE.

Cognitive Level: 2 DR

Source: New Question

31. A Group 5 isolation occurred while operating at full power.

The Group 5 signal is corrected after 1 hour.

Which of the below describes what action is required while restoring the RWCU System to service after this 1 hour period and the reason for the action?

a. The RWCU system needs to be re-vented to remove air pockets.

b. The RWCU system flow needs to be adjusted slowly to avoid thermal shock to the heat exchangers.

c. The RWCU system needs to be pressurized because system pressure will have dropped due to RBCCW removing heat from the non-regenerative heat exchangers.

d. The RWCU system filter demineralizers need to be backwashed and precoated because the resin would be damaged by the heat of the water trapped in the demins during the isolation.

ANSWER: c

Distracter 1: CAUTION on page 28 of OI-261, "Venting the RWCU System should only be accomplished when the reactor is below 212°F or if major maintenance was performed and only after informing the Health Physics Department."

Distracter 2: As part of vessel draining operation, CAUTION on page 26, "RWCU flow rate should be raised slowly to avoid thermal shock to the heat exchangers." (NOT draining in this question) and, part of CAUTION on page 29, "During startup and shutdown of RWCU pumps, pump speed should be adjusted promptly to minimize the time in which the low flow trip is in effect."

Distracter 3: The filter/demins need to be backwashed and precoated if the hold pumps do not start, (NOTE on page 28) however, the temperature of the water trapped in the demins would be normal operating temperature.

REFERENCE: OI-261, Reactor Water Cleanup System

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

K/A Number:A1.05 (Ability to predict and/or monitor changes in parameters associated with operating Reactor Water Cleanup System controls including:
SYSTEM PRESSURE.)

K/A Value: 2.6/2.6

Objective: 11.01.01.06Evaluate plant conditions and control room indications to determine if the Reactor Water Cleanup System is operating as expected and identify any actions that may be necessary to place the Reactor Water Cleanup System in the correct lineup.

Cognitive Level: 3 PEO

Source: New Question

1 Point

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

1 Point

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

1 Point

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

1 Point

35. During containment spray operation, direction is provided in the EOPs to ensure containment sprays isolate once drywell pressure drops below 2 psig.

Which ONE of the following is a reason for ensuring the containment sprays isolate?

a. Allow operation of the Drywell Cooling fans.

b. Provide an injection path for dilution nitrogen (CAD).

c. Ensure maximum flow is available for LPCI mode of RHR.

d. Preclude operation of the Reactor Bldg.-to-Torus Vacuum Breakers.

ANSWER: d

Distracter 1: Operation of Drywell Cooling fans is not a consideration for securing drywell spray.

Distracter 2: CAD can be injected through the Torus Spray header at the same time as the Drywell Sprays are in service.

Distracter 3: Drywell Spray should never in service if adequate core cooling is not assured.

REFERENCE: EOP Bases Document,

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

K/A Number: K5.06 (Knowledge of the operational implications of the following concepts as they apply to the RHR/LPCI Containment Spray System Mode: VACUUM BREAKER OPERATION.)

K/A Value: 2.6/2.8

Objective: 2.01.01.08

For any given RHR System operation or failure, describe the impact of that operation or failure on the following systems or components: PRIMARY CONTAINMENT

Cognitive Level: 1-B

Source: Modified Exam Bank

36. MO-1908 is the Inboard Shutdown Cooling Isolation valve.
MO-1909 is the Outboard Shutdown Cooling Isolation valve.

Which of the following correctly identifies the power supplies to these valves?

a. MO-1908 is powered from 250 VDC bus 1D42.
MO-1909 is powered from 480 VAC bus 1B34.

b. MO-1908 is powered from 480 VAC bus 1B34.
MO-1909 is powered from 250 VDC bus 1D42.

c. Both MO-1908 and MO-1909 are powered from 250 VDC bus 1D42.

d. Both MO-1908 and MO-1909 are powered from 480 VAC bus 1B34.

ANSWER: b

Distracter 1: Correct power supplies but assigned to wrong valves.

Distracter 2: Selected if candidate thinks both are DC valves.

Distracter 3: Selected if candidate thinks both are AC valves.

REFERENCE: OI-149

K/A System: 205000 (Shutdown cooling)

K/A Number: K2.02 (Knowledge of electrical power supplies to the following: Motor Operated valves)

K/A Value: 2.5*/2.7*

Objective: 2.01.01.06 (Given the RHR operating mode and various plant conditions, predict how the RHR system will be impacted by operation or failure of the following support systems: a. Essential 4KV/480 VAC electrical power supplies.)

Cognitive Level: 1-F

Source: NEW

1 Point

37. The plant is in a normal full power lineup when a LOSS of 125 VDC Division 1 occurs.

Which of the following CORRECTLY describes how the LOSS of 125 VDC Division 1 affects the ability of the "A" Standby Diesel Generator (SBDG) to respond to a Loss of Offsite Power initiation signal?

a. No affect. The A SBDG will respond as designed.

b. The A SBDG will NOT auto start.

c. The A SBDG will auto start, but the generator field will NOT flash and the output breaker will NOT auto close onto 1A3.

d. The A SBDG will auto start and the generator field will flash, but the output breaker will NOT auto close onto 1A3.

ANSWER: b

Distracters 1, 2, &3: Div 1 125 VDC supplies all three SBDG components; start logic, field flash and breaker control.

REFERENCE: SD-324; AOP 302.1

K/A System:	263000 (DC Electrical Distribution)
K/A Number:	K3.01 (Knowledge of the effect that a loss or malfunction of the DC electrical distribution system will have on the following: Emergency Generators)
K/A Value:	3.4/3.8
Objective:	19.02.01.05 (Given the SBDG operating mode and various plant conditions, predict how the SBDG will be impacted by the failure of the following support systems: a. 125VDC.)
Cognitive Level:	3-PEO
Source:	NEW

1 Point

38. A long term loss of Division 2 Instrument AC bus 1Y21 would present which of the following concerns?

a. Inboard MSIVs drifting CLOSED due to CV-4371A failing CLOSED.

b. Rising reactor water level due to “B” Recirc MG Set running back to minimum.

c. Inability to move control rods due to CRD Flow control valves failing CLOSED.

d. Increasing reactor power due to a loss of feedwater heating when feedwater heater drain and dump valves fail OPEN.

ANSWER: a

Distracter 1: “B” Recirc MG Set scoop tube will lockup on a loss of 1Y21.

Distracter 2: CRD flow control valves failed closed on a loss of 1Y11.

Distracter 3: Feedwater heater drain and dump fails fail open on a loss of Uninterruptible AC power.

REFERENCE: AOP 317, Loss of 120VAC Inst AC.

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

K/A Number: K6.01 (Knowledge of the effect of a loss or malfunction of the following will have on the Main and Reheat Steam System: ELECTRICAL POWER.)

K/A Value: 3.1/3.3

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: 480 VAC NON-ESSENTIAL MCC 1B22, 480 VAC ESSENTIAL MCC 1B32, RPS. INSTRUMENT AC CONTROL POWER, 125 VDC PANELS 1D13 and 1D23, and 250 VDC PANEL 1D42.

Cognitive Level: 2 RI

Source: New Question

1 Point

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 ≈25Mwe. 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

1 Point

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

1 Point

41. Which of the following Offgas System design feature(s) function to maximize carbon bed efficiency?

a. preheating the offgas with steam prior to the recombiner

b. routing the offgas through the 37 second and 30 minute holdup lines

c. maintaining the carbon bed vaults at 77°F and reheating the offgas prior to the carbon beds

d. 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

1 Point

42. 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

1 Point

43. Which of the following operator actions MUST be taken before the Diesel Fire Pump, 1P-49, can be started locally by lifting one of the two MANUAL START CONTACTOR LEVERS?

In order for 1P-49 to be started by lifting a manual start contactor lever, the operator MUST FIRST...

a. override open the electric fuel solenoid.

b. close the breaker to the emergency start batteries.

c. place Control Switch HS-3300A in 1C-116 in the TEST position.

d. place Control Switch HS-3300A in 1C-116 in either the MAN A or MAN B position.

ANSWER: a

Note: When started from the Control Room or 1C-116 the fuel solenoid is energized to open. On a manual start , there is no fuel until the fuel solenoid is overridden. There are 4 distinct ways to start 1P-49; from the Control Room, HS-3300A to MAN A or MAN B and depress START PB, HS-3300A to TEST, and finally by overriding fuel solenoid and manually lifting a start contactor.
Distracter 1: Batteries are always connected to starter and provide DC control power to 1C116.

Distracter 2: This action by itself will start 1P-49 and is not required to be performed first.

Distracter 3: This action electrically energizes the starting contactors when used in conjunction with the START pushbutton, but is not required to be performed first.

REFERENCE: OI-513

K/A System: 286000 (Fire Protection System)

K/A Number: 2.1.30 (Ability to locate and operate components including local controls.)

K/A Value: 3.9/3.4

Objective: NSPEO Task 9.05 (Plant Equipment Operator)

Cognitive Level: 1-P

Source: NEW

1 Point

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:

		A SFU	B SFU
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.

a. No; the "B" SFU should have automatically started the same as "A" SFU.

b. No; the "B" SFU intake and exhaust dampers, 1V-AD-30B & 1V-AD-31B, should be OPEN.

c. Yes; the "B" SFU will not automatically start until the "A" SFU flow drops to ≤800 scfm.

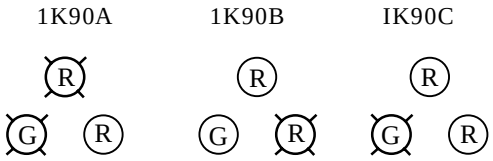
d. Yes; the "B" SFU will not automatically start until the "A" SFU cannot maintain the Control Room at a positive pressure.

ANSWER: c
Note: Initiation takes a lockout >5mr 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 SBGT.
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: 65.01.01.05List 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

1 Point

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

1 Point

48. At which of the following positions is the Transversing Incore Probe (TIP) detector when the associated DETECTOR POSITION display is reading 0001 ?

a. At the CORE TOP position

b. At the CORE BOTTOM position

c. At the INDEXER position

d. At the IN-SHIELD position

ANSWER: c

Distracter 1: 0001 could be core top, i.e. fully inserted.

Distracter 2: 0001 could be core bottom, i.e. starting into the core.

Distracter 3: 0001 could be in-shield, i.e. fully withdrawn.

REFERENCE: System Description 878.6 Traversing In-Core Probe System; OI-878.6

K/A System: 215001 (Traversing In-Core Probe)

K/A Number: A1.02 (Ability to predict and/or monitor changes in parameters associated with operating the Traversing In-Core Probe controls including: DETECTOR POSITION.)

K/A Value: 2.5/2.4

Objective: 83.01.01.07

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

Cognitive Level: 1-F

Source: New Question

1 Point

49. Which of the following are possible indications to the control operator that the in service Fuel Pool Cooling pump has tripped?

a. Annunciator 1C04B, A-4, FUEL POOL HI/LO LEVEL;
lowering Fuel Pool level indicated on LI-3413 at 1C04

b. The Radwaste operator reports an annunciator on Panel 1C136;
rising Fuel Pool level indicated on LI-3413 at 1C04

c. SANSOE reports that there is a Low Flow annunciator on Panel 1C136,
rising Skimmer Surge Tank level indicated on LI-4312 at 1C04

d. 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

1 Point

50. What type of CORE ORIFICING, if any, is used at the Duane Arnold Energy Center?

a. Core orificing is NOT used at the DAEC.

b. Core orificing is used at the DAEC.
The SAME size orifice pieces are used throughout the core.

c. Core orificing is used at the DAEC.
The peripheral orifice pieces are SMALLER (tighter) than the ones used on the core interior.

d. 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 ΔP CONTROL.

b. 1) By raising the CRD Flow Controller FC-1814 setpoint to maximum in AUTO.
   2) By throttling CLOSED MO-1830, DRIVE WATER ΔP CONTROL.

c. 1) By raising the CRD Flow Controller FC-1814 output to maximum in MANUAL.
   2) By throttling OPEN MO-1830, DRIVE WATER ΔP CONTROL.

d. 1) By raising the CRD Flow Controller FC-1814 output to maximum in MANUAL.
   2) By throttling CLOSED MO-1830, DRIVE WATER ΔP 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.

    a. turbine trip; no bus transfer; load shed occurs

    b. turbine trip; bus 1A1 and 1A2 closed circuit transfer to the startup transformer; no load shed

    c. no turbine trip; bus 1A1 and 1A2 closed circuit transfer to the startup transformer; no load shed

    d. 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

1 Point

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

1 Point

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 …

a. that indications from the RPV water level instruments will remain valid after the blowdown.

b. that the blowdown is performed before exceeding the environmental qualification limits of the ADS SRVs.

c. that water hammer will not occur in the Well Water System when Drywell Cooling loop flow is restored.

d. 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

1 Point

57. HOW MANY Liquid Process Radiation Monitors are installed for the Residual Heat Removal Service Water (RHRSW) and Emergency Service Water (ESW) systems and WHAT POINTS do they monitor?

    a. 1 Process Rad Monitor.
    It monitors the combined RHRSW/ESW return flow to the Cooling Towers.

    b. 2 Process Rad Monitors.
    One monitors the combined RHRSW/ESW return flow to the Cooling Towers.
    One monitors the combined RHRSW/ESW return flow to the Discharge Canal.

    c. 3 Process Rad Monitors.
    One monitors RHRSW return flow to the Cooling Towers.
    One monitors ESW return flow to the Cooling Towers.
    One monitors the combined RHRSW/ESW return flow to the Discharge Canal.

    d. 4 Process Rad Monitors.
    One monitors RHRSW return flow to the Cooling Towers.
    One monitors RHRSW return flow to the Discharge Canal.
    One monitors ESW return flow to the Cooling Towers.
    One monitors ESW return flow to the Discharge Canal.

ANSWER: b

Distractor 1:MO-1998A&B are almost always open at power sending flow past the cooling tower return and not the discharge canal. The discharge Canal monitor rarely alarms as is easily forgotten. The Cooling tower return is in the HPCI room and is an occasional problem.

Distractor 2: Possible misconception, but there are only two monitors.

Distractor 3:Possible misconception, but there are only two monitors.

REFERENCE: SD 879.1; ARP 1C03AD-8; P&ID M-113 & 142

K/A System: 400000 (Component Cooling Water)

K/A Number:K1.03 (Knowledge of the physical connections and/or cause–effect relationship between CCWS and the following: Radiation Monitoring Systems)

K/A Value: 2.7/3.0

DAEC Objective: 85.00.00.03 (Describe in detail the subsystems of the PRM system, including methods of detection.)

Cognitive Level: 1-S

Source: NEW

1 Point

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

1 Point

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,

1 Point

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

1 Point

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 ≈ 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

1 Point

67. The following conditions exist during Core Alterations:

- The Mode Switch is in REFUEL.
- The Refueling Bridge is OVER THE CORE.
- The only hoist or platform in service is the main refueling grapple.
- The main refueling grapple is NOT FULL UP but it is UNLOADED.
- The control rods in the cells with fuel are fully inserted.
- Control rods in defueled cells have been tagged out and have had jumpers installed to make them indicate full in.
- There are no control rods selected.

Is it possible to select and fully withdraw a control rod in this configuration?
Also identify the CORRECT reason rod withdrawal IS or IS NOT possible.

a. IS possible.
One control rod may be withdrawn in REFUEL with no restrictions on the main refueling grapple.

b. IS possible.
One control rod may be withdrawn in REFUEL as long as the main refueling grapple is unloaded.

c. IS NOT possible.
A rod block will already be in effect in this configuration because the main refueling grapple is not full up.

d. IS NOT possible.
A rod block will occur as soon as a control rod is selected no matter what the status of the main refueling grapple.

ANSWER: c
Distracter 1& 2: Not possible because the main refueling grapple must be FULL UP and unloaded.
Distracter 3: Not possible is correct but for the wrong reason. If the main refueling grapple is FULL UP and unloaded a rod block will not occur in this scenario.
REFERENCE: SD-281; ARP 1C05B A-6
K/A System: 234000 (Fuel Handling Equipment)
K/A Number: A3.02 (Ability to monitor automatic operation of Fuel Handling Equipment including : interlock operation.)
K/A Value: 3.1/3.7
DAEC Objective: 98.03.01.05 (For each of the following components, explain how it is operated or controlled, state any interlocks that could interrupt its use and how they are bypassed; b. Main hoist grapple)
Cognitive Level: 3-SPK
Source: NEW

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.

Distracter 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.

Distracter 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, <u>All</u> 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?

a. 1C05A, A-1; REACTOR LO-LO-LO LEVEL TRIP

b. 1C05B, C-2; MAIN STEAM LINE HI HI RAD / INOP TRIP

c. 1C05A, B-8 and 1C05B, B-7; PCIS CHANNEL A&B MAIN STEAM LINE HI FLOW

d. 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

1 Point

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

1 Point

74. See the simplified schematic of the Instrument and Service Air System on the next page.

A LOSS OF INSTRUMENT AND SERVICE AIR transient is in progress.

The air header pressure at PS-3024 has lowered to 78 psig.

Which air header isolation valve(s) will be CLOSED ?

- CV-3032, Service Air Header Isolation
- CV-3034, Balance of Plant Instrument Air Header Isolation
- CV-3035, Balance of Plant Instrument Air Header Isolation
- CV-3039, Reactor Bldg. Instrument Air Header Isolation

a. CV-3032 only

b. CV-3032 and CV-3034 only

c. CV-3032, CV-3034, and CV-3035 only

d. CV-3032, CV-3034, CV-3035, and CV-3039

ANSWER: c

Note: The Service air header (CV-3032) isolates at 82 psig.
Instrument air header CV-3034 & CV-3035 isolate at 80 psig.
Reactor Bldg Inst air header isolates at 3inches wg.

Distracter 1: The Service air header (CV-3032) isolates at 82 psig.

Distracter 2: 85 psig is the pressure at which the air dryers auto bypass. The Service air header (CV-3032) isolates at 82 psig.

Distracter 3:

REFERENCE: M-130 Sheet 7, and AOP 518

K/A System: 295019 (Partial or Complete Loss of Instrument Air)

K/A Number: AA1.04 (Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of Instrument Air: SERVICE AIR ISOLATION VALVES.)

K/A Value: 3.3/3.2

DAEC Objective: 36.00.00.04

Describe how the Instrument and Service Air System responds to an isolation signal.

Cognitive Level: 3-SPK

Source: New Question

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 losss 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

1 Point

76. A refueling outage is in progress.

- The A Standby Diesel Generator (SBDG) is tagged out for overhaul.
- All 4KV electrical busses are being supplied by the Startup transformer.
- The distribution system is in a normal lineup with all 480 VAC busses energized.

Operators make a mistake while shifting Shutdown cooling loops that causes RPV level to lower uncontrollably; RPV level is at 60 inches and still lowering.

Which of the following CORRECTLY describes the affect that this transient will have on the electrical distribution system?

a. All 4KV busses will remain energized by the Startup transformer.
All 480 VAC busses will remain energized.

b. All 4KV busses will remain energized by the Startup transformer.
All 480 VAC busses will remain energized except 1B33, 1B35, 1B43, & 1B45 which load shed.

c. Busses 1A1, 1A2, & 1A3 will remain energized by the Startup transformer.
Bus 1A4 will be energized by the B SBDG.
All 480 VAC busses will remain energized.

d. Busses 1A1, 1A2, & 1A3 will remain energized by the Startup transformer.
Bus 1A4 will be energized by the B SBDG.
All 480 VAC busses will remain energized except 1B33, 1B35, 1B43, & 1B45 which load shed.

ANSWER: a

Note: A LOCA signal alone does not cause busses to transfer or to load shed. This requires a combined LOOP/LOCA signal. The B SBDG will start on 3xLOW but does not pick up its bus like on a LOOP/LOCA.

Distractor 1: Selected if candidate thinks a load shed occurs on a LOCA signal only.

Distractor 2: Selected if candidate thinks that the SBDG picks up its bus.

Distractor 3: Selected if candidate thinks a load shed occurs on a LOCA signal only and that the SBDG picks up its bus.

REFERENCE: SD 304
K/A System: 295031 (Reactor low water level- Emergency)
K/A Number: EK2.15 (Knowledge of the interrelations between Reactor low water level and the following: A.C. Distribution
K/A Value: 3.2/3.2
DAEC Objective: 15.00.00.03 Evaluate plant conditions and control room indications to determine if the Electrical distribution system is operating as expected.
Cognitive Level: 2-RI
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. Which of the following conditions would require entry into EOP-2 “Primary Containment Control”?

a. Drywell Pressure at 1.8 psig

b. Torus Water Level at 10.6 ft.

c. Drywell Hydrogen Concentration at 0.5 %

d. Air inlet temperature to the coolers in the CRD area of the Drywell at 155°F

ANSWER: b

Distractor 1: Hi DW pressure alarm is 1.5# and initiates much activity. EOP entry would be 2#.

Distractor 2: EOP entry would be 4.0% not 0.4 %. Common point of confusion.

Distractor 3: EOP entry would be 150°F but based on Average DW Temp not a local temp.

REFERENCE: EOP-2

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

K/A Number: 2.4.2 (Knowledge of system setpoints, interlocks, and automatic actions associated with EOP ENTRY CONDITIONS.)

K/A Value: 3.9/4.1

DAEC Objective: 95.00.00.08 Explain when EOPs are entered

Cognitive Level: 1 F

Source: Exam Bank

1 Point

79. A Recirc Pump has tripped while at full power. The crew has stabilized the plant at approximately 60% power and is performing the necessary ARPs.

Consider only the change in core flow described in this scenario for a given bundle in the center of the core.

Which of the following statements is CORRECT concerning the value of CRITICAL POWER?

a. Critical Power will be HIGHER because the actual bundle power is lower with the reduced Recirc flow.

b. Critical Power will be HIGHER because transition boiling will begin at a lower power with the reduced Recirc flow.

c. Critical Power will be LOWER because the actual bundle power is lower with the reduced Recirc flow.

d. Critical Power will be LOWER because transition boiling will begin at a lower power with the reduced Recirc flow.

ANSWER: d

Note: When flow goes down, the power required to produce boiling transition (Critical Power) goes down. CPR = Critical power / Actual bundle power.

Distracter 1: CPR might be higher but not CP.

Distracter 2: CPR might be higher but not CP.

Distracter 3: CP is lower but it is because flow is lower. CP defines a bundle power but it is not dependent on bundle power.

REFERENCE: BWR Fundamentals Thermodynamics.

K/A System: 295001 (LOSS OF FORCED CIRCULATION)

K/A Number: AK1.03 (Knowledge of the operational implications of the following concepts as they apply to partial or complete loss of forced circulation; THERMAL LIMITS)

K/A Value: 3.6/4.1

DAEC Objective:

Cognitive Level: 2-RI& RW

Source: New

80. A transient occurs which causes EOP-2 entry on low Torus water level.

When Torus level reaches 7.1 ft., the OSS directs that Emergency Depressurization be performed.

What is the basis for Emergency Depressurization at this level?

7.1 ft. is the level at which …

a. it is still allowed to open SRVs.

b. HPCI exhaust becomes uncovered.

c. the Drywell downcomers are uncovered.

d. the Heat Capacity Temperature Limit is exceeded.

ANSWER: c

Distracter 1: EOP 2 directs ED if Torus Water Level cannot be maintained above 7.1 feet, which is the level of downcomer vent openings.

Distracter 2: EOP 2 directs ED if Torus Water Level cannot be maintained above 7.1 feet, which is the level of downcomer vent openings.

Distracter 3: EOP 2 directs ED if Torus Water Level cannot be maintained above 7.1 feet, which is the level of downcomer vent openings.

REFERENCE: EOP Bases Document, EOP 2, page 19 of 69

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

K/A Number: EK2.07 (Knowledge of the interrelations between Low Suppression Pool Water Level and the following: DOWNCOMER/HORIZONTAL VENT SUBMERGENCE)

K/A Value: 3.5/3.8

DAEC Objective: 95.59.03.01

For any given step, Caution, or Continuous Recheck Statement in EOP 2, explain the bases for the statement.

Cognitive Level: 1 B

Source: New Question

1 Point

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: 95.68.08.01For 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. A Group 3 isolation has just occurred due to HIGH RADIATION LEVELS in the Reactor Building Vent Shaft.

At which of the following locations can operators determine the actual radiation levels in the Vent Shaft?

The meter face on the Reactor Bldg. Vent Shaft Rad Monitors can be read...

a. in the Control Room backpanel area at 1C36 (SRM and IRM panel).

b. in the Control Room backpanel area at 1C23 (Main Plant HVAC panel).

c. in the Reactor Bldg., on the North side mezzanine above the CRD Repair Room.

d. in the Reactor Bldg., on the South side mezzanine above the Transversing Incore Probe (TIP) Room.

ANSWER: c

Distracter 1: Selected if candidate confuses RB Vent Shaft Rad Monitors with the Refuel Floor Exhaust Rad Monitors.

Distracter 2: Common misconception. Rad levels cannot be read in the control room but they can be read locally as directed by the ARP. This condition alarms at 1C23 in the backpanel, but there are no monitors there.

Distracter 3: Main Steam line temperatures are read at both in plant location answer options, but the RB Vent shaft can only be read above CRD Repair Room.

REFERENCE: ARP 1C23A&B

K/A System: 295034 (Secondary Containment Ventilation High Radiation)

K/A Number: EA2.01 (Ability to determine and/or interpret as they apply to Secondary Containment Ventilation High Radiation: VENTILATION RADIATION LEVELS)

K/A Value: 3.8/4.2

DAEC Objective: 67.01.01.07 (Identify the appropriate procedures that govern RB HVAC operation , including operator responsibilities in all modes of operation, and any actions required by personnel outside the control room.)

Cognitive Level: 1 S

Source: NEW

1 Point

83. Evaluate the operational implications of a FIRE in the following areas during normal full power operation.

Which one **WOULD NOT** require operators to reduce Recirc Flow to 24Mlb/hr. and manually scram the reactor?

a. Fire in the EHC pump skid area.

b. Fire in the Hydrogen Seal Oil skid area.

c. Fire in the Turbine Lube Oil pump area.

d. Fire in the "B" Standby Diesel Generator Room.

ANSWER: d

Note: The SBDG is by far the most Reactor safety significant equipment. But there is another SBDG and an electrical distribution system to back it up. There is only one turbine and it cannot operate without the other 3 systems. If a candidate rules out the SBDG, the other answer options are all viable.

Distracter 1, 2, & 3: SCRAM required per AOP 913, Fire, Follow-up actions #1.

REFERENCE: AOP 913, Fire

K/A System: 600000 (Plant Fire on Site)

K/A Number: AA2.13 (Ability to determine and interpret the following as they apply to Plant Fire on Site: NEED FOR EMERGENCY REACTOR SHUTDOWN.)

K/A Value: 3.2/3.8

DAEC Objective: 94.25.03.01

State when AOP 913 directs the following during a fire: REACTOR SCRAM.

Cognitive Level: 3-SPK

Source: NEW

84. 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

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?

a. 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.

b. 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.

c. 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.

d. 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: 86.00.00.03Evaluate 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

1 Point

86. 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?

a. The SBGT overpressure relief damper has failed open.

b. The MAIN PLANT EXHAUST FANS (EF-1, 2, &3) have failed to trip as designed on a Group 3 Isolation signal.

c. The REFUELING POOL EXH FAN (EF-10) has failed to trip as designed on a Group 3 Isolation signal.

d. 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

1 Point

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

1 Point

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. The plant has experienced a complete loss of River Water Supply.

A Nuclear Station Operating Engineer (NSOE) has been dispatched from the Work Control Center to the Pump House to establish makeup to the RHRSW/ESW pits from GSW.

Which of the following is CORRECT concerning Procedure Usage Level for this operation?

a. This is a Skill of the Craft activity that does NOT require procedure usage.

b. This is a routine activity that requires Information Use.

c. This is an Abnormal Operating Procedure that requires Reference Use.

d. This is a Supplemental Emergency Procedure that requires Continuous Use.

ANSWER: c

Distracter 1: This procedure has the operator open 3 Control Valves and throttle open a dilution flow throttle valve. A very simple procedure that could be considered skill of the craft but is not listed as one in ACP 1410.1.
Distracter 2: This is a practically a routine activity. This AOP is derived from the procedure for chlorination of the RHRSW/ESW pits. The AOP simply starts the dilution flow and omits the Chlorine injection steps. There is one additional step in the AOP, throttling open the dilution flow throttle valve.
Distracter 3: Supplemental Emergency Procedure sounds plausible but the procedure is in the AOP. There are no sign-off in the SEPs which are necessary for “Continuous Use” procedures.
REFERENCE: ACP 101.01; ACP 1410.1; OI-515; AOP-410
K/A System: GENERIC
K/A Number: 2.1.20 (Ability to execute procedure steps.)
K/A Value: 4.3/4.2
Objective: 96.05.02.21 (Explain the guidance for Operations Procedure Use and Adherance contained in ACP 1410.1.)
Cognitive Level:3-SPK Source: NEW

1 Point

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 <u>both</u> 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

1 Point

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

1 Point

92. A reactor startup is in progress. Conditions just prior to the startup and currently are listed below:

Beginning of Startup	Currently
• SRM A at 9 cps	SRM A at 85 cps
• SRM B at 11 cps	SRM B at 100 cps
• SRM C at 8 cps	SRM C at 90 cps
• SRM D at 10 cps	SRM D at 95 cps
• Moderator temperature was 148°F	Moderator temperature was 149°F

The reactor is NOT critical and you still have one rod left to pull to complete the A12 sequence. In order to pull this control rod to continue the startup, what must you do per IPOI-2 concerning the method of control rod withdrawal?

a. Change from continuous withdrawal to group notch withdrawal.

b. Change from continuous withdrawal to single rod notch withdrawal.

c. Change from single rod notch withdrawal to group notch withdrawal.

d. Change from single rod notch withdrawal to continuous rod withdrawal.

ANSWER: b

Distracter 1: From continuous withdrawal to group notch withdrawal is directed after 75% density has been reached if SRM count rate has not increased by a factor of ten.

Distracter 2: From single notch withdrawal to group notch withdrawal is directed after 75% density has been reached if SRM count rate has increased by a factor of ten.

Distracter 3: From Single notch withdrawal to continuous withdrawal is never directed.

REFERENCE: IPOI 2

K/A System: GENERIC

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

K/A Value: 4.0/3.5

Objective: 93.00.00.04

Contrast the different methods of control rod withdrawal that are used during a reactor startup.

Cognitive Level: 3-SPK

Source: Exam Bank

1 Point

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

1 Point

94. Which of the following system conditions would allow the “A” RHRSW Subsystem to be considered operable with no LCOs?

    a. The “A” RHRSW pump is tagged out for breaker work.

    b. Breaker 1D1315 for 4160V Bus 1A3 switchgear control, has tripped.

    c. The “A” RHRSW strainer backwash valve is stuck closed, but strainer dp is normal while the system is operating.

    d. The “A” RHRSW pump operates, but it's maximum flow is 2000 gpm with MO-2046 RHRSW heat exchanger outlet valve full open. “C” RHRSW pump operates normally.

ANSWER: c

Distracter 1: TS requires both pumps to be operable for the loop to be operable.

Distracter 2: This breaker will prevent operation of either RHRSW pump.

Distracter 3: TS bases states that the required flow per pump be 2040 gpm, and both pumps operating to remove the required heat, (3.7.1 background section).

REFERENCE: OI 416, P&L; TS bases B.3.7.1; AOP 302.1 page 12

K/A System: GENERIC

K/A Number: 2.2.25 (Knowledge of bases in technical specifications for limiting conditions of operations and safety limits.)

K/A Value: 2.5/3.7

Objective: 1.03.02.01Evaluate system status in regard to the LCO applicability and determine system or component operability.

Cognitive Level: 3-SPK

Source: Exam Bank

1 Point

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. An individual radiation worker has exposure history as follows:

Date of Birth: 8/29/63

Lifetime Exposure: 23 R

Exposure this year: 0.8 R

Exposure this quarter: 0.2 R

Today is May 18th. The individual is assigned a job that will take several days. During this job the worker will be in a dose rate of 200 mr/hr.

Which one of the following is the LONGEST TIME the worker can participate in the job before reaching a DAEC administrative exposure limit that requires supervisory or other special permission to continue?

a. 6 hours

b. 9 hours

c. 10 hours

d. 18.5 hours

ANSWER: a

Note: DAEC Annual administrative limit is 2 REM without permission to exceed the limit however, with permission the limit is 4.5 REM.

Distracter 1: 9 Hours to annual limit of 2 REM using the .2 REM quarterly exposure. Possible miscalculation

Distracter 2: 10 hours to reach age limit.

Distracter 3: 18.5 hours to reach yearly limit of 4.5 REM

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: 2.5/3.1

Objective: GET Objective

Cognitive Level: 3 SPK

Source: Exam Bank

1 Point

97. The 1C03 operator is performing an Air Purge (De-inerting) the Primary Containment.

Which of the following radiation monitoring systems monitor the atmosphere that is exhausted through the Drywell/Torus vent valves?

a. Reactor Building Vent KAMAN monitors (KAMAN 3 through 8)

b. Offgas Vent Pipe Rad Monitors (RM-4116A & B) only

c. Offgas Stack KAMAN monitors (KAMAN 9 & 10) only

d. Offgas Vent Pipe Rad Monitors (RM-4116A & B)
and
Offgas Stack KAMAN monitors (KAMAN 9 & 10)

ANSWER: d

Note: This question measures knowledge of how many Radiation Monitors are involved during Containment purge, which comes from ventilation and goes past all 4 monitors. The Vent pipe monitors can send a Group 3 isolation signal.

Distracter 1: Possible misconception because it is not obvious that SBGT in the reactor Bldg. exhausts out the Offgas Stack.

Distracter 2: Possible misconception because it is not obvious that the KAMAN monitors are downstream of the Offgas flow to the offgas stack.

Distracter 3: Common misconception that Vent pipe rad monitors are part of the Offgas system.

REFERENCE: P&ID M-141and M-176

K/A System: GENERIC

K/A Number: 2.3.9 (Knowledge of the process for performing a containment purge.)

K/A Value: 2.5/3.4

Objective: 85.00.00.03 Describe in detail the subsystem of the PRM system, including methods of detection.

Objective: 87.00.00.05 State the effluent types monitored by the KAMAN system.

Cognitive Level: 1-S

Source: New Question

98. Four EOP flowchart symbols are provided on the following page.

Which one is the EOP symbol for an ACTION STATEMENT?

a. A

b. B

c. C

d. D

ANSWER: c

Note: Blanked out segment is from ALC.

Distracter 1: Continuous Recheck Flag.

Distracter 2: Decision Point symbol.

Distracter 3: Hold Point (Wait Until) symbol. .

REFERENCE: EOP Bases, EOP Flowchart Use and Logic

K/A System: GENERIC

K/A Number: 2.4.19 (Knowledge of EOP layout, symbols, and icons.

K/A Value: 2.7/3.7

Objective: 95.00.00.01Interpret the meaning of the color and shape of any EOP flowchart step.

Cognitive Level: 1 F

Source: New Question

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?

a. No; All high priority annunciators have either a blue or red lens.

b. 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.

c. Yes; The annunciator could be a high area WATER LEVEL EOP-3 entry condition.

d. 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?

a. The operator is allowed to perform this procedure from memory and has performed it correctly.

b. The operator is NOT allowed to perform this procedure from memory.

c. The operator is required to start the second EHC pump before opening the Bypass Valves.

d. 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.

Distractor 2, Only one EHC pump is required.

Distractor 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