DUANE ARNOLD

APRIL 2001

PROPOSED WRITTEN EXAMINATION

Original Submittal

Facility: DAEC | Date of Exam: 4/9/01 | Exam Level: RO/SRO

	Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility						
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available						
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401						
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right	NRC: 0	Other: 0				
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]				NA	NA	
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank: 24	Modified: 11	New: 65			
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory: 46	C/A: 54				
8.	References/handouts provided do not give away answers						
9.	Question distribution meets previously approved examination outline; deviations are justified						
10.	Question psychometric quality and format meet ES, Appendix B, guidelines						
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet						

	Printed Name / Signature	Date
a. Author	G.L. Thyllor	3/2/01
b. Facility Reviewer(*)	Keith Young/Keith Young	3/5/01
c. NRC Chief Examiner(*)		
d. NRC Regional Supervisor(*)		

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, 4, 5, and 6.
[ ] The items in brackets do not apply to NRC-prepared examinations.

*Note - substantive changes made to written; therefore, new ES-401-7 forms were developed. AMS

New forms are filed with as-given exam.

original submittal

Facility: DAEC | Date of Exam: 4/9/01 | Exam Level: RO/SRO

	Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility				✓	✓	
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available				✓	✓	
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401				✓	✓	
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right	NRC: 0	Other: 0		✓	✓	
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]				NA	NA	
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank: 24	Modified: 10	New: 66	✓	✓	
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory: 44	C/A: ~~56~~ 46 ✓		✓	✓	
8.	References/handouts provided do not give away answers				✓	✓	
9.	Question distribution meets previously approved examination outline; deviations are justified				✓	✓	
10.	Question psychometric quality and format meet ES, Appendix B, guidelines				✓	✓	
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet				✓	✓	

	Printed Name / Signature	Date
a. Author	G. R. Thullen / G. R. Thullen	3/2/01
b. Facility Reviewer(*)	Keith Young / Keith Young	3/5/01
c. NRC Chief Examiner(*)		
d. NRC Regional Supervisor(*)		

*

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, 4, 5, and 6.
[] The items in brackets do not apply to NRC-prepared examinations.

* Note: Substantive changes were made to the written examination. New ES-401-7 forms were developed AMS

new forms are filed with as given exam

Duane Arnold Energy Center

Reactor Operator

50007

Topic: 2001 ILC
SRO
Written Exam

Rev. 0

DEVELOPED BY: _____ 3/2/2001
Michael Fisher, Date
Instructor

APPROVED BY: Paul D Hansen 3-2-2001
Operations Supervisor (Plant Reviewer) Date

APPROVED BY: _____ 3/2/01
Mike Davis Date
Training Supervisor-Operations

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. See the attached representation of the Electrohydraulic Control (EHC) panel vertical board on the next page.

   IPOI-2 "Startup" has been completed up to section 5.0 "Turbine Ready to 35% Power". The necessary Main Generator support systems are in service and the next steps will synchronize the Generator to the grid.

   Which of the identified sets of controls is utilized when adjusting the Main Generator frequency fo synchronizing to the grid?

   a. A

   b. B

   c. C

   d. D

ANSWER: c

Distracter 1: Line speed matcher sounds plausible but is not used for this operation.

Distracter 2: Pressure Set adjust is manipulated much more often than Load Set adjust.

Distracter 3: Similar to Load Set Adjust, but not used for this operation.

REFERENCE: IPOI-2; OI-698; SD 693.2

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: 51.05 (Perform initial turbine loading)

Cognitive Level: 3-SPK

Source: NEW

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

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

Core flow will rise until...

a. the "B" Recirc Scoop Tube Positioner reaches its ELECTRICAL STOP.

b. the "B" Recirc Scoop Tube Positioner reaches its MECHANICAL STOP.

c. a "B" Recirc Scoop Tube Positioner LOCK-UP occurs due to high milliamp output signal from the controller.

d. a "B" Recirc Scoop Tube Positioner LOCK-UP occurs due to high deviation between the controller demand and the Positioner position.

ANSWER: d

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

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

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

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

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

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

K/A Value: 3.5/3.5

DAEC Objective: 12.00.00.02 Identify the conditions that allow or causes the following to occur:
c. Scoop Tube Lock-up

Cognitive Level: 1-I

Source: NEW

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

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

a. 50%

b. 61%

c. 67.5%

d. 79.3%

ANSWER: c

Distracter 1, 2, 3: Per Technical Specifications, and P & L # 14, the speed of the faster MG shall no 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 wit 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 o OI-264, Reactor Recirculation System, and any applicable ARP, to any component o Recirc System operating status.

Cognitive Level: 3-SPK

Source: Exam Bank

4. A LOCA has occurred.

All control rods are fully inserted.

RPV water level is NOT being maintained above 170″ with high pressure injection sources.

ALC has been entered and Emergency Depressurization is in progress.

As RPV pressure lowers, at approximately what pressure will LPCI pumps commence injecting?

a. 450 psig

b. 330 psig

c. 260 psig

d. 125 psig

ANSWER: c

Note: **ALC Contingency is provided.**

Distracter 1: 450 psig is the pressure at which the injection valve opens.

Distracter 2: 330 psig is the shutoff head of the Core Spray Pump.

Distracter 3: 125 psig is the shutoff head of the Well Water and GSW pumps.

REFERENCE: EOP 1 and ALC Table 1A

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

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

K/A Value: SRO 3.7

Objective: SRO 2.06.01.12

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

Cognitive Level: 3 SPR

Source: New Question

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

Reactor pressure	500 psig
Reactor water level	190"
RPV cooldown rate	30°F/hr

HPCI pump discharge pressure	525 psig
HPCI system flow	3100 gpm

HPCI is operating in CST-to-CST using the FIC in AUTO

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

a. Shift the FIC to MANUAL and raise turbine speed to raise HPCI system flow.

b. Throttle CLOSED CV-2315, Test Bypass Valve, to raise HPCI pump discharge pressure.

c. Control HPCI on the Test Pot and raise turbine speed, to raise HPCI pump discharge pressure, and throttle CV-2315 OPEN to raise system flow.

d. Secure the CST-to-CST lineup and lineup to inject into the RPV. Adjust turbine speed with the FIC until HPCI discharge pressure is 100 psig greater than RPV pressure.

ANSWER: b

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

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

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

REFERENCE: Generic Fundamentals, Chapter 2, Pumps page 21

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

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

K/A Value: 4.3/4.3

DAEC Objective: 5.02.01.03

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

Cognitive Level: 2-RI

Source: New Question

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

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

Which of the following would describe the operating status of these valves IN THE NEXT 10 MINUTES if a COMPLETE LOSS of Instrument and Service Air were to occur?
(Do not assume any HPCI initiations, trips or isolations resulting from the loss of Air transient.)

a. There would be NO CHANGE to these valve positions.

b. The inboard drains, CV-2211 and CV-2234, would be failed OPEN.

c. The outboard drains, CV-2212 and CV-2235, would be failed OPEN.

d. CV-2315 TEST BYPASS would be failed CLOSED.

ANSWER: a

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

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

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

REFERENCE: SD-152

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

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

K/A Value: SRO 3.7

DAEC Objective: SRO 5.17.06.01 (Explain which systems have associated accumulators and describe the extended operation time allowed by accumulators.)

Cognitive Level: 2-RI

Source: NEW

7. Which combination of MCCs, if de-energized, would prevent the operation of both of the Core Spray Subsystems Injection Valves from the control room?

a. 1D41 / 1D42

b. 1B33 / 1B45

c. 1B34 / 1B44

d. 1B35 / 1B43

ANSWER: c

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

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

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

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

REFERENCE: OI-151, Core Spray, Attachment 1

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

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

K/A Value: 2.5/2.7

DAEC Objective: 4.01.01.10

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

Cognitive Level: 1-F

Source: New Question

8. The plant has been in cold shutdown for 12 hours. Shutdown Cooling was adjusted to keep the Reactor coolant temperatures stable. Current conditions are as follows:

- The CRD system is in operation.
- RPV level is 200 inches on the 1C05 GEMAC indicators.
- Both Recirc pumps have been secured.
- "B" RHR pump is running for Shutdown Cooling.
- RWCU inlet temperature is 180°F and stable.
- "B" Recirc Loop suction temperature is 180°F and stable.
- The RPV wall temperature is 180°F and stable.
- Outage work in the Drywell is in progress.
- Many unrelated outage activities, including Control Room panel modifications, are in progress.

While in this condition, the Drywell Health Physics Technician (HP) calls the control room to report high humidity, condensation and wisps of steam in the Drywell basement.

Does this report indicate that a loss of reactor forced circulation flow could have occurred without operator knowledge? (YES or NO)
If NO, identify the correct reason why not.

a. YES

b. NO; RWCU inlet temperature would also be approximately 212°F.

c. NO; "B" Recirc Loop temperature would also be approximately 212°F.

d. NO; The RPV wall temperature would also be approximately 212°F.

ANSWER: a
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 forced or natural circulation. All of these indications would be correct with forced circulation. Not a reliable indication of coolant temperature without forced circulation.
Distracter 1: Stratified flow with CRD going to bottom drain, no change.
Distracter 2: Stagnant flow, no change
Distracter 3: Could be increasing, but changes very slowly and would not be >212°F.
REFERENCE:AOP-149; OI-149; IG 94-01; SEN 171
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: SRO 3.1
DAEC Objective: SRO 5.01.01.01 Evaluate plant conditions and control room indications and determine actions directed by AOP-149. (Loss of S/D Cooling)
Cognitive Level: 2-RI
Source: NEW

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

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

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

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

a. The SBLC system has initiated properly.

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

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

d. The SBLC system has NOT initiated properly because the system discharge pressure will be a 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

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

The following plant conditions exist:

HPCI and RCIC will NOT function.
Feedwater is maintaining RPV level slightly greater than +15"
RPV pressure is at 800 psig
Drywell and Torus Sprays have been initiated and are effective
Torus water level has reached 13.5 ft. even with the maximum amount of water being drained to Radwaste from RHR.

Which of the following statements CORRECTLY explains the required actions?

a. Continue feedwater injection to assure adequate core cooling and continue Drywell Sprays to maintain Drywell temperature < 280°F.

b. Continue feedwater injection to assure adequate core cooling and terminate Drywell Sprays because Drywell vacuum relief CANNOT be assured.

c. Terminate feedwater injection to maintain Torus level below 13.5 ft. and continue Drywell Sprays to maintain Drywell temperature < 280°F.

d. Terminate feedwater injection to maintain Torus level below 13.5 ft. and terminate Drywell Sprays because Drywell vacuum relief CANNOT be assured.

ANSWER: b

Note: **EOP-2 is provided.**

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

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

REFERENCE: EOP 2

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

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

K/A Value: 3.7/4.4

Objective: SRO 6.58.01.05

Evaluate plant conditions and control room indications and determine the actions directed by EOP 2.

Cognitive Level: 3 SPR
Source: Exam Bank

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

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

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

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

a. verify that all control rods have fully inserted.

b. verify that the Group 3A isolation has gone to completion.

c. override CV-4371A, Defeat 11 Containment N2 Supply Isolation Defeat.

d. maintain the MSIVs open with Defeat 17, Hi Condenser Backpressure Isolation Defeat.

ANSWER: b

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

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

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

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

REFERENCE: EOP-1; AOP-358

K/A System: 212000 (Reactor Protection System)

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

K/A Value: SRO 3.7

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

Cognitive Level: 2-RI

Source: New Question

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

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

a. Bearing failure due to oil separation.

b. Injector failure due to incomplete combustion.

c. Exhaust system fire due to combustion product buildup.

d. Engine failure due to water accumulation in the fuel oil.

ANSWER: c

Distracter 1: Plausible but not identified as a consequence.

Distracter 2: Plausible but not identified as a consequence.

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

REFERENCE: OI-324 P&L 15

K/A System: 264000 (SBDG)

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

K/A Value: 3.7/3.7

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

Cognitive Level: 1-D

Source: Bank

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

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

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

Assume that the plant responded as expected.

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

14. PS-4315A, which provides a PRIMARY CONTAINMENT HIGH PRESSURE SIGNAL to the Group 3 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. All four switches are shared but arranged differently in the two logic channels.
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 i similar to Group 1 logic.

REFERENCE: ARP 1C05B, C-8

K/A System: 223002 (PCIS/NSSS)

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

K/A Value: 3.0/3.2

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

Cognitive Level: 2-DR

Source: NEW

15. Do the following Source Range Monitor (SRM) system components REMAIN ENERGIZED or do they become DEENERGIZED by a COMPLETE LOSS of 24 VDC System 1?

1) "A" SRM detector auxiliary trip units
2) "A" SRM detector drive motor power

a. 1) REMAINS ENERGIZED
2) REMAINS ENERGIZED

b. 1) DEENERGIZED
2) REMAINS ENERGIZED

c. 1) REMAINS ENERGIZED
2) DEENERGIZED

d. 1) DEENERGIZED
2) DEENERGIZED

ANSWER: b

Distracter 1: Aux trip units are 24VDC.

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

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

REFERENCE: SD 878.1; APO 375

K/A System: 215004 (Source Range Monitor)

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

K/A Value: 3.1/3.3

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

Cognitive Level: 1-F

Source: New Question

16. The plant is operating at 100% power when an LPRM fails UPSCALE.

Does this failure cause the value of Core Thermal Power (MWTH) on the 3D Monicore official case to REMAIN THE SAME or to INCREASE?

If MWTH INCREASES, identify the CORRECT affect, if any, on the Maximum Fraction of Limiting Power Density (MFLPD) thermal limit.

a. MWTH will REMAIN THE SAME

b. MWTH will INCREASE
MFLPD will REMAIN THE SAME

c. MWTH will INCREASE
MFLPD goes DOWN.

d. MWTH will INCREASE
MFLPD goes UP.

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: MWTH will not change.

Distracter 2: MWTH will not change.

Distracter 3: MWTH will not change. If it did go up, MFLPD would too.

REFERENCE: SD 878.3

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

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

K/A Value: 3.0/3.4

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

Cognitive Level: 2 RI

Source: New Question

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

1C05A, A-2, "A" RPS AUTO SCRAM
1C05A, A-5, NEUTRON MONITORING SYSTEM TRIP
1C05A, B-2, APRM A, C, OR E UPSCALE TRIP OR INOP
1C05A, D-2, APRM DOWNSCALE
1C05B, A-6, ROD OUT BLOCK

The operator discovers that the "C" APRM has just become INOPERABLE.

Which of the following describes the appropriate actions?

a. Insert a full scram.

b. Bypass "B" and "C" APRMs.

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

d. Insert a half scram on the "A" RPS channel.

ANSWER: b

Distracter 1: 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: 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

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

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

K/A Value: 3.1/3.2

Objective: 81.01.01.09

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

Cognitive Level: 1P

Source: New Question

18. Which of the following correctly matches the panel location of the reactor water level and reactor steam dome pressure indications (indicator or recorder) located in the control room with the range of the instruments?

Reactor Water Level Range
A. -153 to 218
B. 8 to 218
C. 158 to 218
D. 158 to 458

Reactor Steam Dome Pressure Range
E. 0 to 250 psig
F. 0 to 1200 psig
G. 0 to 1500 psig
H. 800 to 1100 psig

a. 1C03 has indicators/ranges A, E, and F
1C04 has indicator/range D
1C05 has indicators/ranges B, C, and F
1C09 has indicators/ranges B and G

b. 1C03 has indicators/ranges A, E, and G
1C04 has indicators/ranges D and G
1C05 has indicators/ranges B, C, F, and H
1C09 has indicator/range G

c. 1C03 has indicators/ranges C, D, E, and H
1C04 has indicator/range E
1C05 has indicators/ranges A, B, E, and H
1C09 has indicators/ranges D and E

d. 1C03 has indicators/ranges D, E, and G
1C04 has indicators/ranges D and E
1C05 has indicators/ranges A, B, C, and F
1C09 has indicator/range E

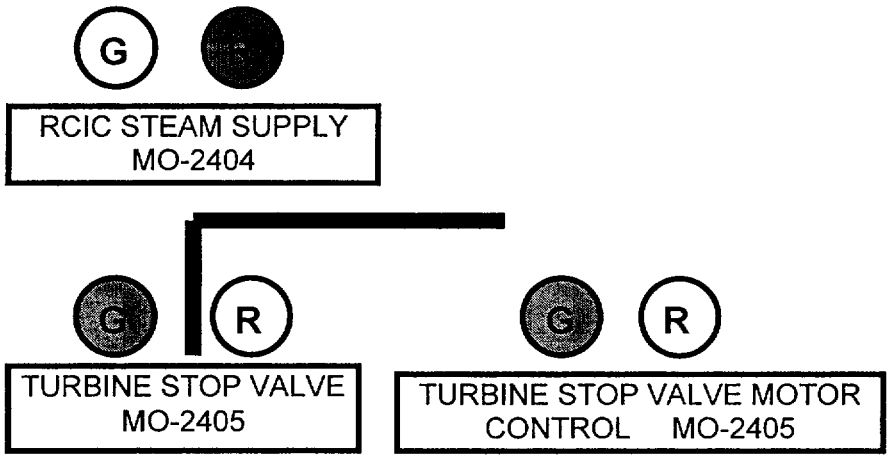
ANSWER: b
Distracter 1, 2, 3: A and E are only at 1C03; B, C, F, and H are only at 1C05; D is only at 1C04, G is at 1C03, 1C05, and 1C09.
REFERENCE: M-115
K/A System: 216000 (Nuclear Boiler Instrumentation)
K/A Number: A1.03 (Ability to predict and/or monitor changes in parameters associated with operating 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: Exam Bank

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

20. The DAEC has experienced a reactor scram. During the IPOI 5 actions, a page announcement was made to notify the in-plant watch standers of the scram.

You have also notified the following people:
System Operation Center
Operations Manager
Plant Manager
Site General Manager
Vice President, Nuclear
Supervisor, Licensing
NRC Region via FTS-2000

Have you contacted all of the correct personnel? If not identify who else needs to be notified.

a. Yes, all of the correct personnel have been notified.

b. No, NRC Resident Inspector must also be notified.

c. No, Manager of Quality Assurance must also be notified.

d. No, Work Control Center Supervisor must also be notified.

ANSWER:	b
Distracter 1:	Per ACP 114.5 and the Action Request form, the NRC resident must be notified.
Distracter 2:	Plausible if the Supervisor, Licensing must to be notified.
Distracter 3:	The Outage Manager used to be notified per ACP 114.5. This function, planning forced outage work, is now performed by Work Control Center Supervisor.
REFERENCE:	IPOI 5, ACP 114.5, and Nureg 1022, Rev.2
K/A System:	295006 (Reactor Scram)
K/A Number:	2.1.14 (Knowledge of system status criteria which require the notification of plant personnel.)
K/A Value:	SRO 3.3
Objective:	SRO 4.21.05Perform the OSS actions for reporting and documenting the scram.
Cognitive Level:	1 P
Source:	New Question

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

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

a. RPV level at +50", RHR pump running with a discharge pressure of 125 psig.

b. RPV level at +115", RHR pump running with a discharge pressure of 135 psig.

c. RPV level at +50", Core Spray pump running with a discharge pressure of 115 psig.

d. RPV level at +115", Core Spray pump running with a discharge pressure of 145 psig.

ANSWER: a

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

REFERENCE: ARP 1C03A A-5

K/A System: 218000 (Automatic Depressurization System)

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

K/A Value: 3.7/3.6

Objective: 8.03.01.03

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

Cognitive Level: 1 I

Source: Exam Bank

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

a. 1B32 / 1B42

b. 1B33 / 1B45

c. 1B34 / 1B44

d. 1B35 / 1B43

ANSWER: d

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

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

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

REFERENCE: OI-760

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

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

K/A Value: 2.7/2.9

Objective: 68.01.01.08

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

Cognitive Level: 1-F

Source: NEW

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

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

a. Both PSV-4401 and PSV-4407 will open.

b. Both PSV-4401 and PSV-4407 will remain closed.

c. PSV-4401 will open and PSV-4407 will remain closed.

d. PSV-4401 will remain closed and PSV-4407 will open.

ANSWER: a

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

REFERENCE: 1C03A, D-5

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

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

K/A Value: 3.4/3.5

Objective: 8.00.00.03 AND 8.03.01.04

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

Cognitive Level: 1 I

Source: Exam Bank

24. The operating crew was forced to rapidly abandon the Control Room and activate the Remote Shutdown Panel. One operator reports to you, the OSS, that he scrammed the reactor but he did not have time to verify that all rods fully inserted.

Does AOP- 915, "Shutdown Outside Control Room", require that completion of the scram be verified in this situation? (YES or NO)

If YES, identify which of the following local indications is used for VERIFICATION of the scram.

a. NO

b. YES; The pressure in the scram air header.

c. YES; The position of 89 pairs of scram inlet and outlet valves.

d. YES; The status of the 89 HCU accumulator alarms on 1C54 and 1C72.

ANSWER: c

REFERENCE: AOP 915 "Shutdown Outside the Control Room"

Distracter 1: Required by AOP 915, Step 10 Tab 3

Distracter 2: All rods should be in if this indicates 0 psig, but it is not the parameter checked.

Distracter 3: All rods should be in if all 89 accumulator have discharged, but it is not the parameter checked.

K/A System: 295016 (Control Room Abandonment)

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

K/A Value: SRO 4.3

Objective: 5.30.01 Direct performance of the verification of reactor scram

Cognitive Level: 1-P

Source: New Question

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

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

a. Turbine Load Set will ramp down, causing the bypass valves to open to control pressure.

If, during this time, no operator action is taken the reactor will scram on high pressure.

b. The bypass valves receive a direct open signal, causing turbine control valves to close to control pressure.

If, during this time, no operator action is taken the reactor will scram on high pressure.

c. Turbine Load Set will ramp down, causing the bypass valves to open to control pressure.

If, during this time, no operator action is taken the turbine will trip and the Turbine Stop Valve closure will scram the reactor.

d. The bypass valves receive a direct open signal, causing turbine control valves to close to control pressure.

If, during this time, no operator action is taken the turbine will trip and the Turbine Stop Valve closure will scram the reactor.

ANSWER: a

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

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

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

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

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

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

K/A Value: 3.7/3.8

Objective: 52.01.01.01

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

Cognitive Level: 2-RI

Source: Exam Bank

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

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

Initiation of Torus Sprays is...

a. NOT ALLOWED by EOP-2. Torus Sprays are used to scrub the air space of radioactive particles in preparation for containment venting and are therefore initiated only after a LOCA

b. NOT ALLOWED by EOP-2. Torus Sprays are used to condense steam in the Torus' enclosed atmosphere thus reducing its pressure and are therefore initiated only after a LOCA.

c. ALLOWED by EOP-2. Torus Sprays are used for evaporative and convective cooling of the Torus' enclosed atmosphere thus reducing its pressure.

d. ALLOWED by EOP-2. Torus Sprays are used to improve the distribution of water returning from the RHR heat exchangers thus helping reduce Torus Average Water temperature.

ANSWER: c

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

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

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

REFERENCE: EOP Bases document.

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

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

K/A Value: 3,8/3.9

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

Cognitive Level: 1-P&B

Source: NEW

27. Starting large loads in the Condensate and Feed system causes voltage transients on the associated 4KV bus. The "D" Well Water Pump, 1P-58D, is affected by such voltage transients.

OI-644 "Condensate and Feedwater Systems" directs that 1P-58D, should be removed from service prior to starting which of the following?

a. "A" Condensate Pump

b. "B" Condensate Pump

c. "A" Feedwater Pump

d. "B" Feedwater Pump

ANSWER: d

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

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

K/A System: 259001 (Reactor Feedwater System)

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

K/A Value: 3.3/3.3

Objective: 45.00.00.03

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

Cognitive Level: 1 P

Source: New Question

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

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

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

Which of the following describes the response of the "B" SBGT system?

a. The "B" SBGT lockout relay will trip.
The "B" SBGT train will function normally.

b. The "B" SBGT lockout relay will NOT trip.
The "B SBGT train Exhaust Fan operation will be inhibited. (Will not auto start).

c. The "B" SBGT lockout relay will trip.
The "B SBGT train Exhaust Fan operation will be inhibited. (Will not auto start).

d. The "B" SBGT train lockout relay will trip.
The "B" SBGT train Exhaust Fan will auto start when/if the "A" SBGT train flow decreases to <3300 SCFM.

ANSWER:	c
Distractor 1:	"B" train auto start is inhibited
Distractor 2:	"B" lockout relay will trip
Distractor 3:	"B" train auto start on low flow is inhibited
REFERENCE:	BECH E113 SHT11
K/A System:	261000 (Standby Gas Treatment System)
K/A Number:	A3.02 (Ability to monitor automatic operations of the Standby Gas Treatment System including: FAN START)
K/A Value:	3.2/3.1
Objective:	7.02.01.03
	Evaluate plant conditions and control room indications to determine if the SBGT System is operating as expected, and identify any actions that may be necessary to place the SBGT System in the correct lineup.
Cognitive Level:	1 I
Source:	Exam Bank

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

1)Are these transmitters calibrated HOT or COLD?
and
2) What type of compensation, if any, do they use?

a. 1) HOT
2) None

b. 1) HOT
2) Temperature compensation

c. 1) COLD
2) None

d. 1) COLD
2) Electronic pressure compensation

ANSWER: a

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

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

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

REFERENCE: SD-880

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

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

K/A Value: 3.1/3.2

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

Cognitive Level: 1-F

Source: NEW

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

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

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

The System Engineer for CRD has been notified.

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

a. Exercise the Control Rod in an attempt to cool it.

b. Fully insert the Control Rod and electrically disarm it.

c. Insert the Control Rod to position 46 to remove it from its backseat.

d. Leave the Control Rod at position 48 and continue to monitor its temperature.

ANSWER: c

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

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

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

REFERENCE: ARP 1C05A, E-6

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

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

K/A Value: SRO 3.7

Objective: 10.01.01.04 Evaluate plant conditions and control room indications to determine if the Control Rod Drive Mechanisms and Hydraulic System is operating as expected, and identify any actions necessary to place the Control Rod Drive Mechanisms and Hydraulic System in the correct lineup.

Cognitive Level: 1 P

Source: New Question

31. ATWS EOP has been entered.

The SBLC System has failed.

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

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

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

a. None, this is an expected indication.

b. Open the CLEANUP DEMIN BYPASS valve, MO-2723.

c. Lower system flow by lowering the running RWCU pump, 1P-205A/B, speed.

d. Throttle RBCCW flow to the Non-Regenerative Heat Exchanger set, 1E-215A/B.

ANSWER: d

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

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

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

REFERENCE: SEP 304 Boron Injection Using RWCU.

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

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

K/A Value: 3.3/3.5

Objective: SRO 6.36.01

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

Objective: 11.01.01.03

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

Objective: NSPEO 47.03.01.04

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

Cognitive Level: 3-SPK

Source: New Question

32. Reg. Guide 1.97 requires the DAEC to have radiation monitors installed specifically for Post-LOCA accident conditions.

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

a. 1C09, "Containment Monitoring" panel

b. 1C10, "Process Rad Monitoring" panel (with 1C02 recorders)

c. 1C29, "Instrument XFV and Sampling" panel

d. 1C36, "SRM and IRM" panel (with 1C02 recorders)

ANSWER: a

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

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

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

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

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

K/A System: 272000 (Radiation Monitoring)

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

K/A Value: 3.5/3.8

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

Cognitive Level: 1-S

Source: NEW

33. A reactor startup is in progress.

The Rod Worth Minimizer (RWM) is in OPERATE.

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

When rod 30-31 is fully withdrawn, 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.

Does this Rod Position Indication System (RPIS) failure affect the Rod Worth Minimizer? (NO or YES)

If YES, correctly identify how it affects the RWM.

a. NO; The RWM gets its position 48 from the same reed switch used for the FULL OUT lights.

b. YES; The RWM will enforce a SELECT BLOCK.

c. YES; The RWM will enforce INSERT and WITHDRAW BLOCKS.

d. YES; There will be NO INSERT, WITHDRAW, or SELECT BLOCKS, but the RWM will provide the message INVALID ROD 30-31 POS, MAX SUBS ALREADY MADE.

ANSWER: c

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

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

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

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

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

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

K/A Value: 3.0/3.2

Objective: 84.00.00.05

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

Cognitive Level: 2-RI

Source: NEW

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

Do operators have the capability of determining the actual radiation levels in the Reactor Building Vent Shaft? (YES or NO)
If YES, identify the LOCATION that these readings are taken.

a. NO

b. YES; The meter face on the monitors can be read in the Control Room backpanel area at 1C36 (SRM and IRM panel).

c. YES; The meter face on the monitors can be read in the Reactor Bldg. North side, on the mezzanine above the CRD Repair Room.

d. YES; The meter face on the monitors can be read in the Reactor Bldg. South side, on the mezzanine above the Transversing Incore Probe (TIP) Room.

ANSWER: c

Distracter 1: 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 2: Selected if candidate confuses RB Vent Shaft Rad Monitors with the Refuel Floor Exhaus Rad Monitors.

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

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

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

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

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

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

a. HAS AUTHORITY
There will be a loss of decay heat removal capacity with the MIN FLOW BYPASS open in the Shutdown Cooling mode.

b. HAS AUTHORITY
Shutdown Cooling flow must be established promptly to avoid draining the RPV while the MIN FLOW BYPASS is open.

c. DOES NOT HAVE AUTHORITY
The Operations Manager has the authority to waive this step.

d. DOES NOT HAVE AUTHORITY
The Emergency Coordinator has the authority to waive this step.

ANSWER: b

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

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

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

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

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

K/A Value: SRO 3.8

Objective: SRO 6.46 Direct crew response for performance of RC/P leg of EOP-1.
SRO 6.46.06 Direct operator actions to initiate Shutdown Cooling using only RHR pumps not required to maintain RPV level >170 inches.

Cognitive Level: 3 SPK
Source: New Question

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

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

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

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

a. Torus Spray valves would open.
Drywell Spray valves would open.

b. Torus Spray valves would NOT open.
Drywell Spray valves would open.

c. Torus Spray valves would open.
Drywell Spray valves would NOT open.

d. Torus Spray valves would NOT open.
Drywell Spray valves would NOT open.

ANSWER: a

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

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

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

REFERENCE: EOP 2 bases

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

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

K/A Value: 3.4/3.5

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

Cognitive Level: 2-RI

Source: New Question

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

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

a. Inboard and Outboard MSIVs are OPEN.

b. Inboard and Outboard MSIVs are CLOSED.

c. Inboard MSIVs are OPEN and Outboard MSIVs are CLOSED.

d. Inboard MSIVs are CLOSED and Outboard MSIVs are OPEN.

ANSWER: a

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

REFERENCE: SD 304 and SD 358

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

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

K/A Value: 3.2/3.3

Objective: 48.01.01.03

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

Cognitive Level: 2 RI

Source: Cooper 1 1999 Exam (INPO Bank)

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

What is the appropriate course of action?

a. Enter EOP 1 and scram the reactor.

b. Enter Emergency Depressurization Contingency and ED.

c. Begin a reactor shutdown per IPOI 3, 4, or 5 as appropriate.

d. Enter EOP 3 and operate available sump pumps to maintain water level less than 2".

ANSWER: d

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

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

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

REFERENCE: EOP 3

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

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

K/A Value: SRO 4.3

Objective: SRO 6.67.01.03

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

Cognitive Level: 3-SPR
Source: Exam Bank

39. The following plant conditions exist:

Core Thermal Power	1658 MWth
Generator Output	560 MWe
Time of day	0000

The Load Dispatcher requests that the DAEC lower generator output by 60 MWe.

How is the power reduction accomplished and when should the power reduction be complete?

a. Generator Output should be lowered by reducing Load Set to 500 MWe and should be completed by 0010.

b. Generator Output should be reduced by inserting control rods and should be completed between 0012 and 0020.

c. Generator Output should be reduced using the Generator Voltage Regulator and should be completed by 0010.

d. Generator Output should be reduced with the Reactor Recirculation System and should be completed between 0012 and 0020.

ANSWER: d

Distracter 1, 2 & 3: In accordance with IPOI 3, power is reduced with Recirc until core flow is 24 Mlbm/hr and at a rate of approximately 5 MWe/min.

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: 57.00.00.02

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

Cognitive Level: 3-SPK

Source: New Question

40. A COMPLETE LOSS Uninterruptible AC Power (1Y23) has occurred while at 100% power.

Which of the following will be a viable, long term, method of controlling reactor pressure after the Main Turbine trips?

a. Main Steam Line Drains

b. Main Turbine Bypass Valves

c. RCIC in CST-to-CST mode

d. HPCI in CST-to-CST mode

ANSWER:	a
Distracter 1:	Uninterruptible AC Power would not be available to power EHC Logic after the turbine trip therefore, turbine bypass valves cannot be used.
Distracter 2:	A loss of Uninterruptible AC power transfers HPCI and RCIC suctions to the Torus and CST-to CST mode cannot be used.
Distracter 3:	A loss of Uninterruptible AC power transfers HPCI and RCIC suctions to the Torus and CST-to CST mode cannot be used.
REFERENCE:	AOP 301, Loss of Essential Power, and AOP 357, Loss of Uninterruptible AC Power.
K/A System:	262002 (Uninterruptible Power Supply)
K/A Number:	K3.13 (Knowledge of the effect that a loss or malfunction of the Uninterruptible Power Supply will have on the following: REACTOR PRESSURE.)
K/A Value:	2.7/2.9
Objective:	52.01.01.02 Given an EHC System operating mode and various plant conditions, predict how the EHC System will be impacted by failures in the following support systems: UNINTERRUPTIBLE AC CONTROL POWER SYSTEM.
Cognitive Level:	2 RI
Source:	Exam Bank

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

The following plant conditions exist:

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

Would it be appropriate for the OSS to direct reopening of the MSIVs/MSL Drains to control reactor pressure? (APPROPRIATE or NOT APPROPRIATE)

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

a. NOT APPROPRIATE; There is indication of a Steam Line break.

b. APPROPRIATE; The main condenser is available and reopening of the MSIVs/MSL Drains will help stabilize RPV pressure.

c. APPROPRIATE; The main condenser is available and reopening of the MSIVs/MSL Drains may eliminate the need to inject SBLC.

d. APPROPRIATE; The main condenser is available and reopening of the MSIVs/MSL Drains will reduce the challenge to Primary Containment.

ANSWER: a

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

Distracter 1: Not appropriate per ATWS EOP bases. The condenser would be available and reopening MSIVs/MSL Drains would help stabilize RPV pressure.

Distracter 2: Not appropriate per ATWS EOP bases. The condenser would be available and reopening of the MSIVs/MSL Drains may eliminate the need to inject SBLC.

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

REFERENCE: ATWS EOP
K/A System: 295025 (High Reactor Pressure)
K/A Number: 2.4.22 (Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.)
K/A Value: SRO 4.0
Objective: SRO 1.21.02 Recognize and prioritize data relevant to the accident or event.
Cognitive Level: 1 B
Source: New Question

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

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

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

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

1) Which type of fire suppression system is used for the Standby Diesel Generators (SBDG) and associated Fuel Oil Day Tank rooms?
and
2) Which type of actuation system releases the priming water pressure from the top of the main valve disc on the Deluge or Preaction system used in the SBDG Rooms?

a. 1) DELUGE
   2) An electronic fire sensor opens a solenoid vent valve to release the pressure.

b. 1) DELUGE
   2) A mechanical Heat Activated Device (HAD) releases the pressure.

c. 1) PREACTION
   2) An electronic fire sensor opens a solenoid vent valve to release the pressure.

d. 1) PREACTION
   2) A mechanical Heat Activated Device (HAD) releases the pressure.

ANSWER: d

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

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

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

REFERENCE: SD 513

K/A System: 286000 (Fire Protection System)

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

K/A Value: 3.2/3.3

Objective: NSPEO 9.01.01.02

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

Cognitive Level: 1-F

Source: New Question

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

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

Which of the following is
1) the proper initial response, if any, to this report?
2) the reason for this response?

a. 1) No response is necessary.
   2) These are not Secondary Containment Airlock doors.

b. 1) No response is necessary.
   2) These are Secondary Containment Airlock doors but they are not required to be operable during Refueling outages.

c. 1) Initiate action to close at least one of these doors within 4 hours.
   2) These are Secondary Containment Airlock doors that are required to be operable in Modes 1, 2, and 3.

d. 1) Suspend movement of irradiated fuel.
   2) These are Secondary Containment Airlock doors that are required to be operable during fuel movement.

ANSWER: d

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

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

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

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

REFERENCE: T. S. 3.6.4.1

K/A System: 290001 (Secondary Containment)

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

K/A Value: 3.3/3.7
Objective:98.02.01.02 (Relate the P&Ls, operating cautions or special cautions of RFP 301, ,RFP 402, and RFP 403 to any fuel handling component or evolution status.)
Cognitive Level: 3-SPK
Source: New

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

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

At 0933, RIM6101A exceeded 5 mR/hr.
At 0935, RIM6101B exceeded 5 mR/hr.

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

	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.

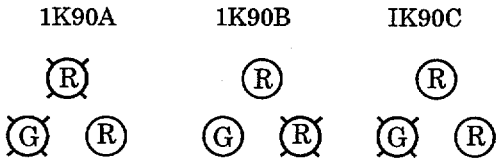
c. Yes; the "B" SFU will not automatically start until the "A" SFU flow drops to ≤800 scfm.

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

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 action 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, an 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.

As the 1C05 operator, are you allowed to throttle closed on MO-1592 and MO-1636, A/B FEEDLINE BLOCK valves, to help control RPV level? (NO or YES)
If YES, identify the statement that correctly describes how these valves are controlled.

a. NO

b. YES; Close either MO-1592 or MO-1636 fully and then throttle the other valve as necessary to restore RPV level.

c. YES; MO-1592 or MO-1636 can be throttled closed but do not close or almost close them with a Feed pump running.
The MO valve positions are indicated on the 1C06 vertical board.

d. YES; MO-1592 or MO-1636 can be throttled closed but do not close or almost close them with a Feed pump running.
There is no indication of the MO valve positions other than the indicating lights which will be dual.

ANSWER: c

Distracter 1: ARP directs throttling these valves.

Distracter 2: Caution warns against closing a valve fully.

Distracter 3: Position indication is available on 1C06.

REFERENCE: ARP 1C05A, D-1

K/A System: 295008 (RPV High level)

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

K/A Value: 3.3/3.3

Objective: 45.01.01.01 (Relate the P&Ls of OI-639, OI-644, and applicable ARPs to Feedwater system operating status.)

Cognitive Level: 1-P& S

Source: NEW

48. Assume that an accident were to occur in the Low Level Radwaste Processing and Storage Facility (LLRPSF) that resulted in a possible Offsite Radioactive release.

What type of effluent monitoring, if any, is installed in the LLRPSF ventilation?

a. NONE.

b. One Normal Range KAMAN Gaseous monitor only.

c. One Accident Range KAMAN Particulate/Iodine monitor only.

d. One Normal Range KAMAN Gaseous monitor
and
One Accident Range KAMAN Particulate/Iodine monitor

ANSWER:	b
Distracter 1:	Possible misconception.
Distracter 2:	Possible misconception. If there is only one monitor, perhaps it should be the acciden range.
Distracter 3:	Possible misconception. All other Kaman Effluent monitoring stations have both normal and accident.
REFERENCE:	SD-879.3

K/A System:	215038 (High Offsite Release Rate)
K/A Number:	EK2.01 (Knowledge of the interrelations between High Offsite Release Rate and the following: Radwaste)
K/A Value:	3.1/3.4
Objective:	87.00.00.05 (State the effluent types monitored by the KAMAN system)
Cognitive Level:	1-F
Source:	NEW

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

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 EHC logic system failure while at power is causing Reactor pressure to rise.

As the 1C05 operator you observe the following indications:

- RPV pressure is 1050 and still rising.
- Annunciator 1C05B, D-4 REACTOR VESSEL HI PRESSURE ALARM has activated.
- APRM flux levels are rising.
- Annunciator 1C05B, A-6, ROD OUT BLOCK has activated.
- Annunciator 1C05A, A-2, "A" RPS AUTO SCRAM has activated.
- 3 of the 4 white lights in SCRAM GROUP A are OFF.

1) Would you be procedurally correct if you depressed the REACTOR MANUAL SCRAM **A** pushbutton without OSS permission and without referencing the 1C05A, A-2 ARP? (CORRECT or NOT CORRECT)

2) Would you be procedurally correct if you depressed the REACTOR MANUAL SCRAM **B** pushbutton without OSS permission and without referencing the 1C05A, A-2 ARP? (CORRECT or NOT CORRECT)

a. 1) CORRECT
   2) CORRECT

b. 1) NOT CORRECT
   2) CORRECT

c. 1) CORRECT
   2) NOT CORRECT

d. 1) NOT CORRECT
   2) NOT CORRECT

ANSWER: a

Distracter 1: Directed by ARP 1C05A, A-2, Step 3.5 and allowed by ACP 1410.1.

Distracter 2: Directed by ARP 1C05A, A-2, Step 3.6.a and allowed by ACP 1410.1.

Distracter 3: Directed by ARP 1C05A, A-2, Step 3.5 and Step 3.6.a and allowed by ACP 1410.1.

REFERENCE: ARP 1C05A, A-2; ACP 1410.1

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: 93.22
Cognitive Level: 3-SPK
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

53. The "B" GEMAC Reference Leg Backfill system was out of service for 10 days when a reactor scram occurred.

- Operators quickly identified and corrected the cause of the scram and stabilized the plant.
- RPV pressure is currently 920 psig and being controlled by EHC.

Is enhanced RPV level monitoring per OI-880 Section J-1 required in this situation? (REQUIRED or NOT REQUIRED)

If REQUIRED, would operators expect to see "notching" in the current plant condition?
If NOT REQUIRED, identify why it is not required.

a. REQUIRED
Notching is expected in the current plant condition.

b. REQUIRED
Notching is NOT expected in the current plant condition.

c. NOT REQUIRED
A Reference Leg Backfill system must be out of service for longer than 14 days before enhanced RPV level monitoring is required.

d. NOT REQUIRED
Both Reference Leg Backfill systems must be out of service for longer than 7 days before enhanced RPV level monitoring is required.

ANSWER: b

Note: GEMAC instruments provide indication and RPV level control.

Distracter 1:Required is correct, but notching happens during cooldown/depressurization., not when stable.

Distracter 2&3: It is required whenever either is OOS for >7 days.

REFERENCE: IPOI-5 P&L 3; SD 880; OI-880

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:88.00.00.05 Explain how non condensible gasses coming out of solution can affect col leg level instruments, when this is expected to occur, and what methods are used to determine level after ED.

Cognitive Level: 2-RI

Source: NEW

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

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

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

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

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

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. Using the EHC Logic Control System diagram provided, select the correct response to the following EHC System conditions.

Throttle pressure	980
Pressure Setpoint	940
Load Limit	100%
Max Combined Flow Limiter	125%

a. The turbine will trip on reverse power.

b. The turbine will trip due to an overspeed condition.

c. The Load Limit will allow a maximum of 100% steam flow to the condenser.

d. All of the Turbine Control Valves will be open and at least one Bypass Valve will be open.

ANSWER: d

Distracter 1: This trip is initiated by 3.5 MWe signal with a 30 second time delay. Generator electrical output should not decrease.

Distracter 2: The turbine speed & acceleration control circuitry should maintain 1800 RPM.

Distracter 3: 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.

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. A plant startup was in progress per IPOI 3. Reactor power was 75% when BOTH Recirc pumps were observed to be running back. The following annunciators were received among others:

1C04A, D-2, "A" RECIRC MG 20% OR 45% LIMITER IN EFFECT
1C04A, D-8, "B" RECIRC MG 20% OR 45% LIMITER IN EFFECT
1C05A, D-1, REACTOR VESSEL HI/LO LEVEL

RPV water level is currently 186" and rising rapidly. What is the probable cause and reason for this transient?

a. Feed flow transmitter failing to zero; prevent Recirc pump and Jet pump cavitation

b. Loss of one Reactor Feed pump causing level to initially drop to <186"; avoid the 170" scram

c. "A" Recirc pump Discharge Valve fails closed; prevent upward axial thrust on the thrust bearings

d. Recirc MG speed control signal failure; ensure that Recirc pump speed change is in the conservative direction

ANSWER:	b
Distracter 1:	Pump discharge valve closed is a 20% runback and would only affect one recirc pump.
Distracter 2:	Feed flow transmitter is a 20% runback and at 75% a loss of one feed flow transmitter should lower feed flow to 37.5%.
Distracter 3:	Loss of speed signal would lockup scoop tubes not a runback. (SD 264 page 34)
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:	2 RI
Source:	Modified from Exam Bank Question # 681

57. Given the following sets of parameters:

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

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

a. Case 1) ED NOT required
   Case 2) ED NOT required

b. Case 1) ED NOT required
   Case 2) ED required

c. Case 1) ED required
   Case 2) ED NOT required

d. Case 1) ED required
   Case 2) ED required

ANSWER: b

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

Distractor 1: Case 2 ED required

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

Distractor 3: Case 1 Not ED required

REFERENCE: EOP-2 and Bases

K/A System: 295026

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

K/A Value: SRO 3.9

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

Cognitive Level: 3-SPR

Source: NEW

58. Under which of the following scenarios is the reactor considered to be unstable and should be manually scrammed?

a. The reactor is operating in the exclusion zone with three APRMs showing 8% peak-to-peak swings that are stable.

b. The reactor is operating in the buffer zone and three APRMs show peak-to-peak swings of 6% and trending downward.

c. The reactor is operating in the buffer zone and two APRMs show peak-to-peak swings greater than normal and trending upward.

d. The reactor is operating outside the buffer zone with one APRM having peak-to-peak swings o 12% and trending downward.

ANSWER: c

Note: Scram required for "undamped oscillations greater than normal"

Distracter 1: APRM readings stable. AOP-255.2 Follow-up Action 4.b requires exit exclusion region by raising Recirc flow or inserting control rods

Distracter 2: APRM readings normal for this transient. AOP-255.2 Follow-up Action 4.b requires Solomon report and subsequent corrective actions.

Distracter 3: APRM readings normal for this transient. This is the proper region of the Power/Flow map to be operating in.

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: 1 D

Source: Exam Bank, Question # 2174

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

Step 39 rods are at position 12.

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

The Rod Worth Minimizer has been bypassed.

Which Control Rod should be inserted FIRST?
And
HOW FAR should it be inserted when it is first moved?

a. Rod 14-15
To position 12

b. Rod 14-15
To position 00

c. Rod 22-15
To position 10

d. Rod 22-15
To position 00

ANSWER: d

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

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

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

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

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

K/A System: 295014 (Inadvertent Reactivity Addition)

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

K/A Value: 3.5/3.5

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

Cognitive Level: 3-SPR

Source: NEW

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

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

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

ED is performed...

a. to ensure the Torus design temperature is not exceeded.

b. to ensure the continued operability of RPV level instrumentation.

c. because the pressure suppression function of the Torus has been lost.

d. because the Primary Containment Pressure limit has been exceeded.

ANSWER: c

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

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

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

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

K/A System: 295024 (High Drywell Pressure)

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

K/A Value: 3.7/4.1

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

Cognitive Level: 1B

Source: Modified Exam Bank,

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

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

a. Begin a plant cooldown.

b. Vent the Containment and begin de-inerting.

c. Bypass the Reactor Bldg. Main Intake cooling coils.

d. Initiate the Containment Atmosphere Dilution (CAD) system.

ANSWER: d

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

Distracter 1: Directed by ARP.

Distracter 2: Directed by ARP.

Distracter 3: Directed by ARP.

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

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

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

K/A Value: 3.2/3.4

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

Cognitive Level: 1-P

Source: NEW

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

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

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

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

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

a. RPV pressure is being controlled by LLS and MSL Drains.
The heat energy still being produced by the reactor is NORMAL decay heat.

b. RPV pressure is being controlled by MSL drains because the LLS SRVs are not open.
The heat energy still being produced by the reactor is NORMAL decay heat.

c. RPV pressure is being controlled by LLS and MSL Drains.
The heat energy still being produced by the reactor is HIGHER THAN NORMAL decay heat due to the power history before the reactor was shutdown.

d. RPV pressure is being controlled by LLS and MSL Drains.
The heat energy still being produced by the reactor is MUCH HIGHER THAN NORMAL and indicates that the reactor is not shutdown.

ANSWER: d
Note: Reactor decay heat 1 second after shutdown is 6.2%. Each SRV has ≈ 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 th ADS system or the LLS system is operating as expected and identify any actions that may be necessar 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 o 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. Which containment spray subsystems are 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: Procedural steps dictate which CAD spray header to inject with dependent on if you are venting containment from the Drywell or Torus.

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.

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 Contro 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 locks 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 Immediat 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 an the following: EMERGENCY GENERATORS)

K/A Value: 4.1/4.2

DAEC Objective: 19.00.00.03

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

Cognitive Level: 3 PEO

Source: Exam Bank

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

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

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

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

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

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

a. RPV level is 40″ and rising.

b. RPV level is 65″ and rising.

c. RPV level is 85″ and rising.

d. RPV level is indeterminate but rising at this time.

ANSWER: d

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

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

REFERENCE: EOP-1 Cautions Bases; SD-880

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

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

K/A Value: SRO 4.6*

DAEC Objective: SRO Task 1.21 Direct crew response to off normal events/accidents.
SRO Objective 1.21.02.01 Verify the initial conditions using alternate indications.

Cognitive Level: 2-RI

Source: Bank

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

The Main Turbine/Generator is still in operation.

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

1. Trip the H and I breakers
2. Transfer 1A1 and 1A2 to the Startup Transformer
3. Trip the generator field breaker

a. 1, 3, 2

b. 2, 1, 3

c. 2, 3, 1

d. 3, 1, 2

ANSWER:	b
Distractor 1:	Per AOP-302.1 page 3 sequence. Tripping H&I open first will cause an Open Circuit transfer of Non-Ess Busses.
Distracter 2:	Per AOP-302.1 page 3 sequence. Tripping the Generator Field Breaker open first wi cause the Generator Backup Lockout Relay to energize, and an Open Circuit transfe of the Non-Ess Busses.
Distracter 3:	Per AOP-302.1 page 3 sequence. Tripping the Generator Field Breaker open first wil 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:	3.8/4.1
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 reactor is shutdown and at normal operating temperature and pressure.

The "A" Loop of Drywell Cooling system is in a normal operating lineup.

The "B" Loop of Drywell Cooling system is in an unusual lineup:

- LOOP B Mode Switch is in STANDBY.
- All Recirculation fan handswitches are in AUTO.
- Drywell Cooling Well Water Supply and Return valves CV-5718B and CV-5704B are open.

1) Would a HIGH AIR OUTLET Temperature from the Drywell coolers cause the "B" Cooling Fans to switch to high speed? (YES or NO)

2) Would a HIGH WATER OUTLET Temperature from the Drywell coolers cause the "B" Cooling Fans to switch to high speed? (YES or NO)

a. 1) YES
   2) YES

b. 1) YES
   2) NO

c. 1) NO
   2) YES

d. 1) NO
   2) NO

ANSWER: a

Distractor 1, 2, 3: 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.

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; REACOR 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

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

b. 2

c. 3

d. 4

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 Main Plant Intake Coils bypass valve opens to maximize cooling to the Drywell.

b. The Control Building Chillers bypass valve opens to shift the chiller heat load to ESW.

c. The Domestic Water Storage Tank supply valve closes to ensure all flow is into the essential loads.

d. The selected Condenser Air Cooling Coil isolates to remove the heat input from the Condenser Bay.

ANSWER: a

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

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

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

REFERENCE: AOP 408, Automatic Actions

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

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

K/A Value: 2.9/3.2

DAEC Objective: 26.01.01.14

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

Cognitive Level: 2-RI

Source: Modified, Exam Bank

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

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

Assume that the following conditions occur in sequential order from a-d. At which point will the OSS direct that the SBLC pumps be secured?

Secure the SBLC pumps ...

a. when all APRMs downscale lights are on.

b. when all control rods are inserted to at least position 04.

c. after the RPV has been Emergency Depressurized.

d. when the SBLC tank lowers to 0%.

ANSWER: d

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

Distracter 2: DAEC Max Subcritical Banked Withdrawal Position is 02.

Distracter 3: ED changes nothing.

REFERENCE: OI-153

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

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

K/A Value: SRO 4.4*

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

Cognitive Level: 1-P

Source: Bank

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

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

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

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

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

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

a. ONE manual reset of 1A3 or 1A4 lockout may be attempted before Electricians arrive.
If that lockout resets, NO attempt may be made to reset the other bus.

b. ONE manual reset of 1A3 or 1A4 lockout may be attempted before Electricians arrive.
If that lockout resets, ONE attempt may be made to reset the other bus.

c. ONE manual reset of 1A3 or 1A4 lockout may be attempted but only after consultation with Electricians.
If that lockout resets, and the Electricians agree, ONE attempt may be made to reset the othe bus.

d. NO manual reset attempts may be made until Electricians have completed a full inspection of each bus.

ANSWER: a

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

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

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

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

REFERENCE: AOP 3.01
K/A System: 295031 (Reactor low water level- Emergency)
K/A Number: Generic 2.4.8 (Knowledge of how event based Emergency/Abnormal operating procedures are used in conjunction with symptom based EOPs.)
K/A Value: SRO 3.7
DAEC Objective: SRO 5.38.02 (Direct operator actions to mitigate the consequences of a Loss of Offsit Power and stabilize plant parameters.)
Cognitive Level: 3-SPK
Source: New

77. An accident has occurred.

Current plant conditions are as follows:

All control rods are inserted.

Reactor water level	130″ and stable
Reactor pressure	55 psig and stable
Drywell pressure:	4 psig and slowly lowering
Drywell temperature:	145°F and stable
Torus pressure:	3 psig and slowly lowering
Torus water temperature:	190°F and stable
Torus water level	10.4 ft. and stable

Torus and Drywell Sprays are in operation.
Torus Cooling is maximized.
"A" and "B" Core Spray pumps are injecting into the RPV.

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

a. Low pressure ECCS pumps could lose NPSH and cavitate.

b. Introduction of air into the containment with the potential for deflagration conditions.

c. Design external pressure on the containment could be exceeded, resulting in containment failure.

d. Failure of the Torus to Drywell vacuum breakers to function, causing drywell spray operation to be prohibited.

ANSWER:	a
Distractor 1:	Drop in drywell pressure will isolate containment spray valves.
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 an effect of any EOP Curve or Limit.
Cognitive Level:	3 SPK
Source:	New Question

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

- The B Recirc pump has been properly secured and its discharge valve reopened after 5 minutes.
- Reactor power was 70% with a load line of 100%.
- The speed of the "A" Recirc pump is currently at 41%.

1) Is it expected that the actual flow in the "B" Recirc Loop be FORWARD or REVERSE in this plant condition?

2) Will that make the 1C05 TOTAL CORE FLOW indication ACCURATE or NOT ACCURATE for your decisions as an OSS?

a. 1) FORWARD
   2) 1C05 TOTAL CORE FLOW indication will be ACCURATE because the "B" Loop forward flow will be added to the "A" Loop forward flow.

b. 1) FORWARD
   2) 1C05 TOTAL CORE FLOW indication will NOT BE ACCURATE because the "B" Loop forward flow will be subtracted from the "A" Loop forward flow.

c. 1) REVERSE
   2) 1C05 TOTAL CORE FLOW indication will be ACCURATE because the "B" Loop reverse flow will be subtracted from the "A" Loop forward flow.

d. 1) REVERSE
   2) 1C05 TOTAL CORE FLOW indication will NOT BE ACCURATE because the "B" Loop reverse flow will be subtracted from the "A" Loop forward flow.

ANSWER: b
Note: With the trip annunciator in, the field breaker would be open, which causes the flows to be subtracted from each other. Reverse flow does not occur in the idle loop until the operating pump speed is >50%, but it is given at 41%.
Distractor 1:If all flow is forward, these values should be added, not subtracted for an accurate reading
Distractor 2:Flow would be forward, not reverse. The indication would not be accurate when subtracting a flow that is actually forward.
Distractor 3: Flow would be forward, not reverse.
REFERENCE: SD 264 pg 40&41; ARP 1C04A A-6
K/A System: 295001 (Partial or complete loss of forced circulation)
K/A Number: A2.03 (Ability to determine and/or interpret the following as they apply to Partial or complete loss of forced circulation: Actual Core Flow.)
K/A Value: SRO 3.3
DAEC Objective: SRO Task 1.21 Direct crew response to off normal events/accidents.
SRO Objective 1.21.02.01 Verify the initial conditions using alternate indications.
Cognitive Level: 2-RI
Source: NEW

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

All control rods full in	
Reactor pressure	950 psig
Reactor water level	190″
Reactor power	120 cps
Drywell pressure	20 psig
Drywell air temperature	325°F
Torus pressure	17 psig
Torus water temperature	160°F
Torus water level	9.0 ft

a. The Pressure Suppression Pressure Limit has been exceeded and Emergency Depressurization must be performed.

b. The Boron Injection Initiation Temperature Limit has been exceeded and Boron must be injected because the Heat Capacity Limit may be exceeded.

c. The RPV Saturation Temperature has been exceeded and Fuel Zone and GEMAC RPV water level indications must be adjusted by subtracting 23 inches.

d. The Heat Capacity Limit has been exceeded and Emergency Depressurization must be performed if reactor pressure or torus temperature cannot be reduced.

ANSWER: d

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

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

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

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

REFERENCE: EOP Curves and Limits

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

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

K/A Value: 3.8/4.1

DAEC Objective: 95.00.00.17

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

Cognitive Level: 3 SPR

Source: New Question

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

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

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

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

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

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

- Reactor power 20% (slowly lowering)
- Reactor water level 150" (being intentionally lowered)
- Reactor pressure 880 psig (stable with MSIVs open)

The South CRD Module Area Radiation Monitor (ARM) 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 briefs the crew that EOP-3 has been 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 i 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. The plant is at full power during normal working hours.

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

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

The OSM takes or directs the following actions:

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

Have the OSM's actions complied with the Emergency Plan? (YES or NO)
If NO, identify the way in which the OSM has not complied.

a. YES, all of the OSM's actions have complied with the Emergency Plan.

b. NO; The entire plant must be evacuated when the Evacuation Alarm is used for an EAL declaration.

c. NO; An On-Site Rad Condition classification must be declared, not a HU-5 based on OSM judgement.

d. NO; The Evacuation Alarm is only used for EAL declarations of ALERT or greater, and may not be used for a Notification of Unusual Event.

ANSWER: b
Note: **Emergency Plan Implementing Procedure EAL Tables are provided.**
Distracter 1: Not per EPIP 1.3 In an EAL condition, the entire plant must be evacuated for accountability purposes.
Distracter 2: The only On-site rad condition NUE is AU2 which has entry condition of 1000X normal ARM reading and is therefore not applicable. There is no restriction for using HU5 on rad conditions.
Distracter 3: Evac alarm must be sounded for Alert or greater ,but may also be used for general evacuation or NUEs. Common misconception.
REFERENCE: EPIP 1.3
K/A System: GENERIC
K/A Number: 2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.
K/A Value: SRO 3.3
DAEC Objective: SRO 3.01.03.01 Explain the responsibilities and instructions contained in EPIP 1.3 (Plant assembly and site evacuation)
Cognitive Level: 3-SPK
Source: New

83. Postulated scenario:

It is 0500 on a quiet midshift during normal full power operation. The STA's wife calls to tell him that she has gone into labor and that she needs to get to the hospital. The Operations Shift Manager (OSM) tells the STA to go home and then calls the Operations Manager and the STA's relief. The STA relief arrives in 1 ½ hours and is briefed on the plant status by the OSM.

In the above postulated scenario, has the OSM complied with the shift manning requirements of ACP 1410.1, "Conduct of Operations"? (COMPLIED or NOT COMPLIED)

If NOT COMPLIED, identify the requirement that was not satisfied.

a. COMPLIED

b. NOT COMPLIED; The STA MAY NOT leave until his relief has arrived on site and has been briefed.

c. NOT COMPLIED; The STA MAY leave before his relief arrives, but the relief must be on site and briefed within ONE HOUR of the STA's departure.

d. NOT COMPLIED; The Plant Manager's permission is required for even a temporary reduction in operating crew staffing.

ANSWER: a

Note: This question is based on a plant event and relatively recent change to ACP1410.1. Operations Manager must be notified, the relief on board in 2 hours and briefed, and the plant must be stable These are all conditions satisfied in the postulated scenario.

Distracter 1: STA may leave under the stated conditions.

Distracter 2: The relief has 2 hours to man the watch.

Distracter 3: Operations Manager required ; not Plant Manager.

REFERENCE: ACP 1410.1

K/A System: Generic

K/A Number: 2.1.4 (Knowledge of shift staffing requirements.)

K/A Value: SRO 3.4

DAEC Objective: SRO 1.01.01.01 Explain the crews responsibilities and authorities, the requirements, instructions and attachments of ACP1410.1 (Conduct of Ops)

Cognitive Level: 3-SPK

Source: NEW

84. DAEC Technical Specifications are provided.

The DAEC is in the process of shutting down in accordance with IPOI 4.

Reactor power is 16% and operators are inserting control rods for the next steps of IPOI-4 "Shutdown" which is to take the Mode Switch out of RUN.

The Rod Worth Minimizer (RWM) has become inoperable and its mode switch must be taken to BYPASS.

At this situation, is the RWM required to be operable per Technical Specifications? (REQUIRED or NOT REQUIRED)

If REQUIRED, correctly identify the Tech Spec REQUIRED ACTION.
If NOT REQUIRED, correctly identify why it is not required by Tech Specs.

a. REQUIRED
Suspend control rod movement except by scram.

b. REQUIRED
Verify movement of control rods is in compliance with Banked Position Withdrawal Sequence by a second licensed operator or other qualified member of the technical staff.

c. NOT REQUIRED
The RWM is not required when reactor power is greater than 10%.

d. NOT REQUIRED
The RWM is not required whenever The (reactor) Mode Switch is RUN.

ANSWER: c

Note: The candidate must use a T.S. table to determine applicability, and table notes to identify other specified conditions, thereby demonstrating the ability to apply Tech Specs.
Distracter 1: Common misconception because Plant procedures require a second operator whenever th RWM is bypassed. Required Action is from RWM inop during startup, Condition C.
Distractor 2:Common misconception because plant procedures require a second operator whenever the RWM is bypassed. Required Action is verbatim from RWM inop Condition D which is N/A >10%.
Distracter 3: Not required is correct, but could be required in RUN if <10% power.
REFERENCE: Technical Specifications 3.3.2.1.D, IPOI 4
K/A System: GENERIC
K/A Number: 2.1.12 (Ability to apply Technical Specifications for a system.)
K/A Value: SRO 4.0
Objective: SRO 1.02.03.01 Explain the requirements of Conditions, Required Actions, and Completion Times, when entering planned and unplanned LCOs.
Cognitive Level: 3 SPR
Source: Revised, Exam Bank

85. During some fuel handling operations, a spent fuel bundle is dropped onto the reactor core and is damaged.

Annunciators 1C04B A-6, REACTOR BLDG ARM HI RAD and 1C03A A-1, FUEL POOL EXHAUST RIS-4131A/B HI-HI RAD, are alarming and the ANSOE reports the following readings

Fuel Pool Exhaust, RIS-4131A:	15 mr/hr
Fuel Pool Exhaust, RIS-4131B:	2 mr/hr
North Refuel Floor, RI-9163:	110 mr/hr
South Refuel Floor, RI-9164:	115 mr/hr
Spent Fuel Pool Area, RI-9178:	118 mr/hr
New Fuel Vault Area, RI-9153:	90 mr/hr

Which one of the following is indicated by these readings, and what automatic actions are expected?

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 th ARM System is operating as expected, and identify any actions that may be necessary to place the ARM System in the correct lineup.
Cognitive Level:	2-RI
Source:	Exam Bank

86. The Shutdown Margin must be determined when the DAEC loads new fuel during a Refueling Outage.

The Reactor Engineers (REs) have analytically determined this value for the next cycle.

Is there any additional way that shutdown margin is determined at the DAEC? (NO or YES) If YES, identify the additional method of determining Shutdown Margin.

a. NO; Only the analytical method is used to determine Shutdown Margin at DAEC.

b. YES; A Surveillance Test is also performed.
In order to reduce uncertainties in the REs' calculation, this test identifies the rod positions and other plant conditions at which the SRM counts increase by a factor of 10.

c. YES; A Surveillance Test is also performed.
In order to reduce uncertainties in the REs' calculation, this test identifies the rod positions and other plant conditions at which the reactor achieves criticality.

d. YES; A Surveillance Test is also performed.
In order to reduce uncertainties in the REs' calculation, this test identifies the rod positions and other plant conditions at which the reactor achieves 100% power.

ANSWER: c

Note: **Section 3.1.1 will be removed from the Tech Specs provided to SRO Candidates.** STP 3.1.1-01 is performed every first startup per IPOI-1 to reduce uncertainties in the calculation.

Distracter 1:

Distracter 2: STP is performed but SDM is calculated using Critical data, not SRM counts. Plausible distracter because the factor of 10 increase value is the point at which notch withdrawal must begin.

Distracter 3: STP is performed but SDM is calculated using Critical data, not 100%. Plausible distracter because number of rods remaining partially inserted at full power.

REFERENCE: TS 3.1.1

K/A System: GENERIC

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

K/A Value: SRO 3.2*

Objective: SRO 4.23.01 Direct performance of applicable portions of IPOI-1 (Startup Checklist) attachments and checklists.

Cognitive Level: 1-F

Source: New Question

87. The Steam Tunnel and Reactor Building are equipped with blowout panels that relieve internal pressure when pressure exceeds 7"Hg.

What are the design bases for these blowout panels?

1) Steam Tunnel
2) Reactor Building

a. 1) Prevent structural failure of the Steam Tunnel due to a steam leak in the Steam Tunnel.
   2) Prevent structural failure of the Reactor Bldg. due to a design basis Tornado.

b. 1) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Steam Tunnel.
   2) Prevent structural failure of the Reactor Bldg. due to a design basis Tornado.

c. 1) Prevent structural failure of the Steam Tunnel due to a steam leak in the Steam Tunnel.
   2) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Reactor Bldg.

d. 1) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Steam Tunnel.
   2) Prevent structural failure of the Reactor Bldg. due to a steam leak in the Reactor Bldg.

ANSWER: a

Distracter 1, 2, 3: Per UFSAR Chapter 3.3; The Reactor Building blowout panels protect the Reactor Building during the design tornado. Per UFSAR Chapter 3.6, Steam Tunnel blowout panels protect the Steam Tunnel not the Reactor Building.

REFERENCE: System Description 170.1, Secondary Containment, pages 5 and 6

K/A System: 295035 (Secondary Containment High Differential Pressure)

K/A Number: EK3.01 (Knowledge of the reasons for the following responses as they apply to Secondary Containment High Differential Pressure: BLOW-OUT PANEL OPERATION.)

K/A Value: 2.8/3.1

DAEC Objective: 50007.04.03

State the internal pressure limit for the Steam Tunnel and Refuel Floor Structure and explain how excessive pressure is managed.

Cognitive Level: 1 B

Source: New Question

88. **See the partially completed page of IPOI-2 "Startup" on the next page of this exam.**

A startup is in progress after a short duration maintenance outage.

A Drywell entry was NOT performed.

The next step of the startup is to withdraw control rods to establish one Turbine Bypass Valve 20%-90% open.

Assume that the attached page is the Working Copy of IPOI-2.

Does the placekeeping /logkeeping on the attached page comply with plant procedures? (YES or NO)

If NO, identify the CORRECT reason it is not in compliance.

a. YES

b. NO; IPOI-2 steps may NOT be marked N/A (Not Applicable).

c. NO; The correction in step (b)1 was NOT performed properly.

d. NO; 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 must be initialed or signed.

Distracter 2: Steps may be marked N/A per ODI-022 and ACP 101.01

Distracter 3: Correction was performed perfectly per current rev of ODI 022. A recent concern has been that ALL corrections must be initialed, dated and timed. So as of the date of question development, the date and time are excessive, but not improper. If ODI-022 is revised, this answer option will still be in compliance.

REFERENCE: ODI-022, ACP-101.01

K/A System: GENERIC

K/A Number: 2.1.18 (Ability to make accurate, clear and concise logs, records, status boards, and reports.)

K/A Value: 2.9/3.0

Objective: 96.05 Conduct plant operations in accordance with Administrative Procedures

Cognitive Level: 3-SPK

Source: New Question

89. Which of the following is NOT a responsibility of the OSS in regards to processing a Temporary Document Change Form in accordance with ACP 106.1, "Procedure Preparation, Revision, Review and Approval"?

a. Ensure facility license is not violated.

b. Performing a Safety Evaluation.

c. Ensuring that the intent of the procedure is not changed.

d. Ensure that both the originator and procedure owner have signed within one working day.

ANSWER:	b
Distracter 1:	The OSS shall ensure facility license is not violated.
Distractor 2:	The OSS shall ensure that the intent of the procedure is not changed by the DCF.
Distracter 3:	The OSS shall ensure that both the originator and procedure owner have signed within one working day.
REFERENCE:	ACP 106.1, "Procedure Preparation, Revision, Review, and Approval"
K/A System:	GENERIC
K/A Number:	2.2.6 (Knowledge of the process for making changes in procedures as described in th Safety Analysis Report.)
K/A Value:	2.3/3.3
Objective:	SRO 1.11.02.08 Explain the OSS's responsibilities regarding ACP 106.1, Procedure Preparation, Revision, Review and Approval.
Cognitive Level:	1 F
Source:	New Question

90. See the attached RPV instrumentation schematic of 1C56 on the next page.

Given:

- PI-4553 provides indication only.
- PS-4549 provides a protective function.

Are there any prerequisite conditions for venting PI-4553 based on its instrument line connections (NO Conditions or SOME Conditions)

If there are SOME prerequisite conditions for venting PI-4553 based on its instrument line connections, are they:

MORE Restrictive,

LESS Restrictive,

or the SAME Restrictions

when compared to PS-4549?

a. PI-4553 can be vented with NO restrictions.

b. SOME prerequisite conditions.
MORE Restrictive than PS-4549.

c. SOME prerequisite conditions.
LESS Restrictive than PS-4549.

d. SOME prerequisite conditions.
The SAME Restrictions as PS-4549.

ANSWER: D
REFERENCE: ACP 1410.1 Conduct of Ops, Section 3.9 (8)-(11); SD 880
Note: Question is based on a plant event. PS-4549 provides high pressure scram signal. However, the point of the question is that both instruments share a common instrument leg with instruments that have protective functions and thus require an approved procedure.
Distracter 1, 2, & 3: Both require OSS/OSM concurrence and an approved procedure because they are on the same sensing line.

K/A System: 2.1
K/A Number: 2.1.1 (Knowledge of Conduct of Operations requirements.)
K/A Value: 3.7/3.8
Objective: Industry Events

Cognitive Level: 3-SPK

Source: Revised, Exam Bank

91. Which of the following CORRECTLY describes the purpose of the End of Core Life Recirc Pump Trip (EOC-RPT) logic?

The purpose of the EOC RPT trip is to...

a. rapidly shutdown the reactor in the event of an ATWS.

b. rapidly shutdown the reactor at EOC when MAPRAT is the greatest.

c. mitigate the core-wide pressurization transient caused by a Group 1 isolation.

d. reduce the severity of the thermal transient caused by a turbine trip without bypass.

ANSWER:	d
Distracter 1:	This shutdown would be the ATWS-ARI trip
Distracter 2:	The thermal limit of concern is MCPR.
Distracter 3:	The MSIV closure pressure transient would be mitigated by SRVs.
REFERENCE:	SD 264
K/A System:	GENERIC
K/A Number:	2.1.28 (Knowledge of the purpose and function of major system components and controls.)
K/A Value:	3.2/3.3
Objective:	12.00.00.03c Describe the operation of the following principle Recirc System components: RPT BREAKERS.
Cognitive Level:	1 B
Source:	Exam Bank

92. The plant is at 95% power. Due to heavy flooding upstream, the river has had excessive amounts of debris.

The Trash Rake has been used several times to clear the Trash Bars.

The "A" RWS pump is running.

The NSPEO reports from the Intake Structure that there is a large tree hung up on the Trash Bars.

About 3 minutes later annunciator 1C06A, A-1 "A" RWS PIT LO LEVEL comes in, followed shortly by annunciator 1C06A, A-2 "B" RWS PIT LO LEVEL.

The NSPEO reports that the Trash Bars are clogging rapidly and the flow of river water into the pits has stopped.

What would be the appropriate initial response under these conditions?

a. Manually scram the reactor.

b. Attempt to start standby pumps in both RWS Subsystems.

c. Line up the sand jets and or use fire hoses to clear the debris.

d. If either "A" or "B" RHRSW/ESW PIT LO LEVEL annunciators come in, scram the reactor.

ANSWER: a

REFERENCE: AOP 410

Distracter 1, 2, & 3: Flow of water into RWS suction pits indicates a complete loss of RWS, which calls for an immediate manual reactor scram.

K/A System: GENERIC

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

K/A Value: SRO 3.6

Objective: 5.15.01 Direct operators to perform the immediate actions of AOP 410 (Loss of RWS)

Note: This event has a 5% risk ranking of initiating events by contribution to total core damage frequency (PRA).

Cognitive Level: 1-P

Source: Bank

93. The plant is operating at full power. The A Core Spray pump breaker has been racked out and tagged out for an oil change on the pump motor. After the hold card was cleared, the operators performed the following 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 evolution can the Limiting condition for Operation (LCO) be exited?

The LCO can be exited as soon as ...

a. the breaker has been racked up.

b. the contact GAP has been verified acceptable.

c. the Control Room operators have verified the A Core Spray pump indicating lights at 1C03.

d. the Control Room operators have successfully started and stopped the A Core Spray pump.

ANSWER: d

Distracter 1, 2, & 3:The breaker requires testing to prove its operability. It must be closed in , not just racked in .

REFERENCE: ACP 1410.2, OI-304.2

K/A System: GENERIC

K/A Number: 2.2.23 (Ability to track limiting conditions of operation.)

K/A Value: 2.6/3.8

Objective: 15.01.01.01

Cognitive Level: 3-SPK

Source: NEW

94. At the Remote Shutdown Panel 1C388, there are controls for the B Loop RHRSW.

1) Are the RHRSW controls a REQUIRED FUNCTION or NOT a REQUIRED FUNCTION for the operability Remote Shutdown System per Technical Specification 3.3.3.2 ?

2) Identify the correct reason for the answer to Part 1 of this question.

a. 1) REQUIRED FUNCTION
   2) RHRSW is required for the CONTAINMENT CONTROL function of the Remote Shutdown System.

b. 1) REQUIRED FUNCTION
   2) RHRSW is required for the DECAY HEAT REMOVAL function of the Remote Shutdown System.

c. 1) NOT a REQUIRED FUNCTION
   2) RHRSW is NOT required for the RPV INVENTORY CONTROL function of the Remote Shutdown System.

d. 1) NOT a REQUIRED FUNCTION
   2) RHRSW is NOT required for the RPV PRESSURE CONTOL function of the Remote Shutdown System.

ANSWER: b

Distracter 1: There is no containment control function of the RSP.

Distracter 2: RHRSW controls are a required function, if not necessarily for RPV inventory control.

Distracter 3: RHRSW controls are a required function, if not necessarily for RPV pressure control.

REFERENCE: T.S. Bases B3.3.3.2 & Table 3.3.3.2-1

K/A System: GENERIC

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

K/A Value: SRO 3.7

Objective: SRO 1.11.01.01 Explain the contents of each section of Technical Specifications and their associated bases.

Cognitive Level: 1B
Source: New Question

95. Are the following items a responsibility of a Reactor Operator in complying with ACP 1411.1, "The ALARA Emphasis Program"? (YES or NO)

1) Follow Radiation Protection procedures.

2) Implement measures to minimize dose while conducting activities within the controlled areas.

3) Make recommendations to improve the ALARA Emphasis Program.

a. 1) YES
2) YES
3) YES

b. 1) YES
2) YES
3) NO

c. 1) YES
2) NO
3) YES

d. 1) NO
2) YES
3) YES

ANSWER: a

Distracter 1, 2, & 3: All 3 are either RAD worker or Every Individual responsibilities.

REFERENCE: ACP 1411.1, The ALARA Emphasis Program

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 F

Source: Revised

96. ACP 14.11.17 is "Occupational Dose Limits and Upgrades". It sets the DAEC administrative radiation exposure limits for routine operations and identifies which managers can authorize upgrades to higher limits.

It also sets a maximum exposure limit for routine operation during any calendar year. No one has been given the authority to upgrade past this limit.

Which of the following is that exposure limit?

a. 3.0 rem TEDE

b. 3.5 rem TEDE

c. 4.0 rem TEDE

d. 4.5 rem TEDE

ANSWER: d

Note: SRO titles at DAEC are "Operations Shift Supervisor" and "Operations Shift Manager".

Distracter 1: The limit above which requires First Manager permission.

Distracter 2: Plausible and homogeneous distracter.

Distracter 3: The limit above which requires Department Manager permission.

REFERENCE: ACP 1411.17, Occupational Dose Limits and Upgrades.

K/A System: GENERIC

K/A Number: 2.3.4 (Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.)

K/A Value: SRO 3.1

Objective: GET Objective

Cognitive Level: 1-F

Source: New

97. The plant is at 30% power and being shutdown for a Drywell entry to find the cause of increased floor drain leakage.

Operators were about to commence an air purge (de-inerting) of the containment when both Offgas Stack Radiation Monitors, RM-4116A&B, became INOPERABLE, as indicated by Annunciator 1C03A, C-4, OFFGAS VENT PIPE RM-4116A/B RAD MONITOR DNSCL/INOP.

KAMAN 9 and 10, Offgas Stack KAMAN monitors, remain operable.

May the other operators begin de-inerting while RM-4116A&B are not operable?
(DE-INERTING MAY NOT BEGIN or MAY BEGIN)
If MAY NOT BEGIN, identify the correct reason why not.
If MAY BEGIN, identify the correct compensatory measures that must be taken.

a. DE-INERTING MAY NOT BEGIN
There would be NO Group 3 isolation from the RM-4116A&B inoperability.
However, containment venting in this situation would be an unmonitored release.

b. DE-INERTING MAY NOT BEGIN
A Group 3 isolation would be in effect due to RM-4116A&B inoperability.
This would not allow containment venting.

c. DE-INERTING MAY BEGIN
A Group 3 isolation would be in effect due to RM-4116A&B inoperability.
Operators may override the Group 3 isolation with the keylock switches on 1C04 and begin containment venting.

d. DE-INERTING MAY BEGIN
There would be NO Group 3 isolation from the RM-4116A&B inoperability.
Operators may establish administrative control over the containment vent valve controls with continuous monitoring of alternate instrumentation.

ANSWER: d

Note: This question is based on a plant event in which a Work Order was planned incorrectly due to lack of knowledge of this requirement. Tech Spec provided to SRO candidates. Candidate must also know that RM-4116A&B inoperability is not a Group 3 isolation signal. Answer is also available in Tech Specs.
Distracter 1: Allowed by OI-573 P&L 12. Release would still be monitored by Offgas Stack KAMAN.
Distracter 2: Allowed by OI-573 P&L 12. Upscale trips from these rad monitors is a group 3 but not inop.
Distracter 3:Upscale trips from these rad monitors is a Group 3 but not inop. Overrides would not be necessary.
REFERENCE: OI-573; 1C03A, C-4; Tech Spec 3.3.6.1
K/A System: GENERIC
K/A Number: 2.3.9 (Knowledge of the process for performing a containment purge.)
K/A Value: 2.5/3.4
Objective: 42.01.01.01 Relate the P&Ls, operating cautions or procedural notes of OI-573 and any applicable ARP to any component or Primary Containment Atmosphere monitoring and control system operating status.
Cognitive Level: 3-SPR & SPK
Source: New Question

98. In which of the following documents are the OPERABILITY REQUIREMENTS found for Electric and Diesel Fire pumps (1P-48 & 1P-49)?

OPERABILITY REQUIREMENTS for Electric and Diesel Fire pumps are found in ...

a. the DAEC Fire Plan.

b. the DAEC Technical Requirements Manual.

c. Abnormal Operating Procedure (AOP) 913, "Fire".

d. Administrative Control Procedure (ACP) 1412.4 "Impairments to Fire Protection Systems".

ANSWER: a

Note : Tech Specs are not good answer option because they are provided with SRO Exam.

Distracter 1: TRM is very similar to Tech Specs and a viable place to find Operability Requirements.

Distracter 2: AOP 913 lists safe shutdown equipment but not Operability Requirements.

Distracter 3: ACP 1412.4 lists compensatory measures when Fire system equipment is impaired , but not Operability Requirements.

REFERENCE: DAEC Fire Plan

K/A System: GENERIC

K/A Number: 2.4.25 (Knowledge of Fire Protection procedures.)

K/A Value: SRO 3.4

Objective: 2.02.02.05 Demonstrate the ability to read and interpret Att. 3, 4, & 5 and the DAEC Fire Plan operability requirements.

Cognitive Level: 1-F

Source: New

99. The RHR System was placed in the Shutdown Cooling mode during a normal shutdown.

Shortly after that, RPV level began to lower for no known reason. 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 (Near the door by the Fire Panel). You are too far away to read the annunciator.

Could this be a high priority annunciator?

a. 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.

b. Yes; The annunciator could be a high area RADIATION EOP-3 entry condition.

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

Distracter 1: 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 this event.

Distracter 2: Hi Area Radiation is an EOP-3 entry condition, but this annunciator is on panel 1C04B.

Distracter 3: Hi Area Temps is an EOP-3 entry condition, but this 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 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 1 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.

Has the operator in the above postulated scenario acted correctly?

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

b. No, The operator is NOT allowed to perform this procedure from memory.

c. No, The operator is required to start the second EHC pump before opening the Bypass Valves.

d. No, 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

Duane Arnold Energy Center

Reactor Operator

50007

Topic: 2001 ILC RO Written Exam

Rev. 0

DEVELOPED BY: Michael Fisher — 2/23/2001
Michael Fisher, Instructor — Date

APPROVED BY: Paul D Hansen — 2-23-2001
Operations Supervisor (Plant Reviewer) — Date

APPROVED BY: S R Thullen for — 2/23/01
Mike Davis, Training Supervisor-Operations — Date

Available Responses: 100

DAEC original answer key have a red border, what do not copy well

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.

   If the mode switch on the 1C36 drawer for A IRM were to be taken to the STANDBY position, would a ½ scram result? (YES or NO)
   If NO, which of the following CORRECTLY describes why a ½ scram would not occur?

   a. YES; A half scram would result.

   b. NO; There would be NO CHANGE to RPS because APRM A is bypassed.

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

   d. NO; 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

1 Poin

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 no 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 wit 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 c OI-264, Reactor Recirculation System, and any applicable ARP, to any component o 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

1 Point

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 hov 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

1 Point

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 will be greater than 56 gpm.

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

d. The SBLC system has NOT initiated properly because the system discharge pressure will be a 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 at 75% power for Turbine testing, STP 3.3.1.1-19 "Functional Test of TSV Closure Input to RPS and RPT".

When both pushbuttons for Turbine Stop Valve 1 and 2, in RPS Channel A1, are simultaneously depressed, does a ½ scram occur on RPS Channel A?

a. YES; The RPS system is designed for ½ scrams during this type of testing.

b. NO; The ½ scram is inhibited when relay blocks are installed in the appropriate RPS relays at the beginning of this section of the STP.

c. NO; 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.

d. NO; The ½ scram is inhibited when the RPS CHANNEL A1 & A2 TEST switches, C71A-S2A & S2C, on 1C15, are 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: This is a functional test performed by operators. It requires I&C techs to install relay blocks

Distracter 2: 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.

Distracter 3: These switches are used during ATWS to cause a ½ scram, not inhibit one.

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.

What would be the effect on the Reactor Protection System (RPS) scram logic if the following conditions were to exist?

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

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

1 Point

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 3 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. All four switches are shared but arranged differently in the two logic channels.
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 i 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 100% power when an LPRM fails UPSCALE.

Does this failure cause the value of Core Thermal Power (MWTH) on the 3D Monicore official case to REMAIN THE SAME or to INCREASE?

If MWTH INCREASES, identify the CORRECT affect, if any, on the Maximum Fraction of Limiting Power Density (MFLPD) thermal limit.

a. MWTH will REMAIN THE SAME

b. MWTH will INCREASE
MFLPD will REMAIN THE SAME

c. MWTH will INCREASE
MFLPD goes DOWN.

d. MWTH will INCREASE
MFLPD goes UP.

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: MWTH will not change.

Distracter 2: MWTH will not change.

Distracter 3: MWTH will not change. If it did go up, MFLPD would too.

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

The operator discovers that the "C" APRM has just become INOPERABLE.

Which of the following describes the appropriate actions?

a. Insert a full scram.

b. Bypass "B" and "C" APRMs.

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

d. Insert a half scram on the "A" RPS channel.

ANSWER: b

Distracter 1: 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: 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

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

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

K/A Value: 3.1/3.2

Objective: 81.01.01.09

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

Cognitive Level: 1P

Source: New Question

18. Which of the following correctly matches the panel location of the reactor water level and reactor steam dome pressure indications (indicator or recorder) located in the control room with the range of the instruments?

Reactor Water Level Range
A. -153 to 218
B. 8 to 218
C. 158 to 218
D. 158 to 458

Reactor Steam Dome Pressure Range
E. 0 to 250 psig
F. 0 to 1200 psig
G. 0 to 1500 psig
H. 800 to 1100 psig

a. 1C03 has indicators/ranges A, E, and F
1C04 has indicator/range D
1C05 has indicators/ranges B, C, and F
1C09 has indicators/ranges B and G

b. 1C03 has indicators/ranges A, E, and G
1C04 has indicators/ranges D and G
1C05 has indicators/ranges B, C, F, and H
1C09 has indicator/range G

c. 1C03 has indicators/ranges C, D, E, and H
1C04 has indicator/range E
1C05 has indicators/ranges A, B, E, and H
1C09 has indicators/ranges D and E

d. 1C03 has indicators/ranges D, E, and G
1C04 has indicators/ranges D and E
1C05 has indicators/ranges A, B, C, and F
1C09 has indicator/range E

ANSWER: b
Distracter 1, 2, 3: A and E are only at 1C03; B, C, F, and H are only at 1C05; D is only at 1C04, G is at 1C03, 1C05, and 1C09.
REFERENCE: M-115
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: Exam Bank

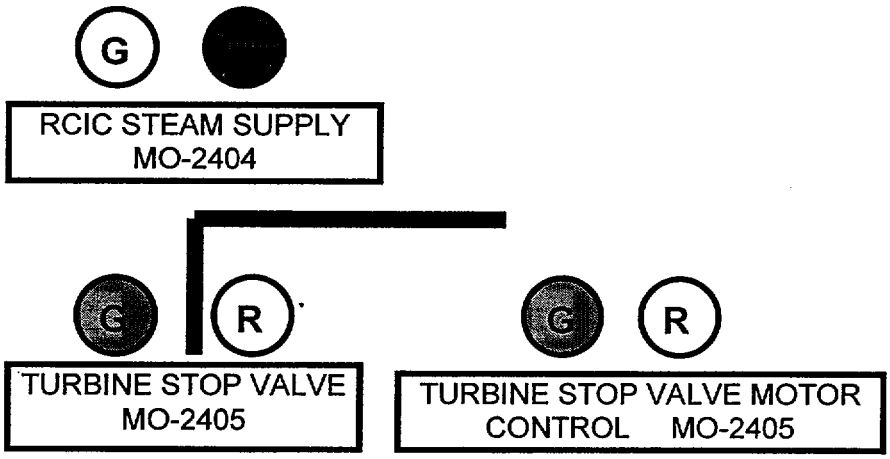
1 Point

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: 3.02.01.05

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

Cognitive Level: 2-DR

Source: Modified , Exam Bank

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 perform a reactor cooldown using the ADS SRVs.

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

a. The ADS SRVs CAN be used without any restrictions.

b. The ADS SRVs CAN be used until Torus water level reaches 13.5 ft.

c. The ADS SRVs WILL NOT OPEN because Torus pressure is too high.

d. The ADS SRVs CANNOT be used because Torus water level is too high.

ANSWER: c

Distracters 1, 2, and 3: The SRVs will be closed at less than 50 psid.

REFERENCE:

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: 8.01.01.02

Given 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 Poin

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 chambe 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. Starting large loads in the Condensate and Feed system causes voltage transients on the associated 4KV bus. The "D" Well Water Pump, 1P-58D, is affected by such voltage transients.

OI-644 "Condensate and Feedwater Systems" directs that 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 train lockout relay will trip.
The "B" SBGT train Exhaust Fan will auto start when/if the "A" SBGT train flow decreases to <3300 SCFM.

ANSWER:	c
Distractor 1:	"B" train auto start is inhibited
Distractor 2:	"B" lockout relay will trip
Distractor 3:	"B" train auto start on low flow is inhibited
REFERENCE:	BECH E113 SHT11
K/A System:	261000 (Standby Gas Treatment System)
K/A Number:	A3.02 (Ability to monitor automatic operations of the Standby Gas Treatment System including: FAN START)
K/A Value:	3.2/3.1
Objective:	7.02.01.03 Evaluate plant conditions and control room indications to determine if the SBGT System is operating as expected, and identify any actions that may be necessary to place the SBGT System in the correct lineup.
Cognitive Level:	1 I
Source:	Exam Bank

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

1)Are these transmitters calibrated HOT or COLD?
and
2) What type of compensation, if any, do they use?

a. 1) HOT
2) None

b. 1) HOT
2) Temperature compensation

c. 1) COLD
2) None

d. 1) COLD
2) Electronic pressure compensation

ANSWER: a

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

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

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

REFERENCE: SD-880

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

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

K/A Value: 3.1/3.2

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

Cognitive Level: 1-F

Source: NEW

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

1 Point

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-LOCA accident conditions.

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

a. 1C09, "Containment Monitoring" panel

b. 1C10, "Process Rad Monitoring" panel (with 1C02 recorders)

c. 1C29, "Instrument XFV and Sampling" panel

d. 1C36, "SRM and IRM" panel (with 1C02 recorders)

ANSWER: a

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

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

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

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

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

K/A System: 272000 (Radiation Monitoring)

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

K/A Value: 3.5/3.8

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

Cognitive Level: 1-S

Source: NEW

33. A reactor startup is in progress.

The Rod Worth Minimizer (RWM) is in OPERATE.

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

When rod 30-31 is fully withdrawn, 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.

Does this Rod Position Indication System (RPIS) failure affect the Rod Worth Minimizer? (NO or YES)

If YES, correctly identify how it affects the RWM.

a. NO; The RWM gets its position 48 from the same reed switch used for the FULL OUT lights.

b. YES; The RWM will enforce a SELECT BLOCK.

c. YES; The RWM will enforce INSERT and WITHDRAW BLOCKS.

d. YES; 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. With the plant operating in Mode 1, the following annunciator is received:

1C08B,C-7, LC 1B4 BREAKER 1B401,1B402, 1B403 OR 1B404 TRIP

If it is determined that 1B404 has tripped, resulting in a loss of 1B44, which mode of operation of the "B" Loop of the RHR System is available for use?

a. LPCI

b. Drywell Spray

c. Torus Cooling

d. Shutdown Cooling

ANSWER:	a
Distracter 1:	Drywell Spray Valves are powered from 1B44
Distracter 2:	Torus Cooling Valves are powered from 1B44
Distracter 3:	Pump suction valves to Shutdown Cooling are powered from 1B44
REFERENCE:	AOP 301, Loss of Essential Electrical Power, page 31

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:	2 RI
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 below 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. Ensure margin to negative design pressure of primary containment.

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 Drywel 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 operatior or failure on the following systems or components:
PRIMARY CONTAINMENT

Cognitive Level: 1-B

Source: Modified Exam Bank

1 Point

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 wil NOT auto close onto 1A3.

d. The A SBDG will auto start and the generator field will flash, but the output breaker will NO 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. The following plant conditions exist:

Core Thermal Power	1658 MWth
Generator Output	560 MWe
Time of day	0000

The Load Dispatcher requests that the DAEC lower generator output by 60 MWe.

How is the power reduction accomplished and when should the power reduction be complete?

a. Generator Output should be lowered by reducing Load Set to 500 MWe and should be completed by 0010.

b. Generator Output should be reduced by inserting control rods and should be completed between 0012 and 0020.

c. Generator Output should be reduced using the Generator Voltage Regulator and should be completed by 0010.

d. Generator Output should be reduced with the Reactor Recirculation System and should be completed between 0012 and 0020.

ANSWER:	d
Distracter 1, 2 & 3:	In accordance with IPOI 3, power is reduced with Recirc until core flow is 24 Mlbm/hr and at a rate of approximately 5 MWe/min.
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:	57.00.00.02 Evaluate plant conditions and control room indications to determine if the Main Generator System is operating as expected, and identify any actions that may be necessary to place the Main Generator System in the correct lineup.
Cognitive Level:	3-SPK
Source:	New Question

1 Point

40. A COMPLETE LOSS Uninterruptible AC Power (1Y23) has occurred while at 100% power.

Which of the following will be a viable, long term, method of controlling reactor pressure after the Main Turbine trips?

a. Main Steam Line Drains

b. Main Turbine Bypass Valves

c. RCIC in CST-to-CST mode

d. HPCI in CST-to-CST mode

ANSWER:	a
Distracter 1:	Uninterruptible AC Power would not be available to power EHC Logic after the turbine trip therefore, turbine bypass valves cannot be used.
Distracter 2:	A loss of Uninterruptible AC power transfers HPCI and RCIC suctions to the Torus and CST-to CST mode cannot be used.
Distracter 3:	A loss of Uninterruptible AC power transfers HPCI and RCIC suctions to the Torus and CST-to CST mode cannot be used.
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. See the attached representation of the Electrohydraulic Control (EHC) panel vertical board on the next page.

IPOI-2 "Startup" has been completed up to section 5.0 "Turbine Ready to 35% Power". The necessary Main Generator support systems are in service and the next steps will synchronize the Generator to the grid.

Which of the identified sets of controls is utilized when adjusting the Main Generator frequency for synchronizing to the grid?

a. A

b. B

c. C

d. D

ANSWER: c

Distracter 1: Line speed matcher sounds plausible but is not used for this operation.

Distracter 2: Pressure Set adjust is manipulated much more often than Load Set adjust.

Distracter 3: Similar to Load Set Adjust, but not used for this operation.

REFERENCE: IPOI-2; OI-698; SD 693.2

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: 51.05 (Perform initial turbine loading)

Cognitive Level: 3-SPK

Source: NEW

1 Point

43. An operator has been sent to perform a local manual start of the Diesel Fire Pump, 1P-49.

The operator raises ONLY ONE manual start contactor lever on 1P-49. After an appropriate amount of time, he releases the contactor lever. Assume no other operator action(s).

Will the Diesel Fire Pump start and continue to run for the near future? (YES or NO)
If NO; identify the CORRECT reason that 1P-49 will not be operating.

a. YES

b. NO; The electric fuel solenoid must be overridden open first.

c. NO; The breaker to the emergency start batteries must be closed first.

d. NO; Both manual start contactor levers must be raised and then released.

ANSWER: b

Distracter 1: No fuel until the fuel solenoid is overridden.

Distracter 2: No such breaker.

Distracter 3: There are two contacters so this sounds plausible. The question stem leads towards this answer, but only one contactor is necessary.

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.

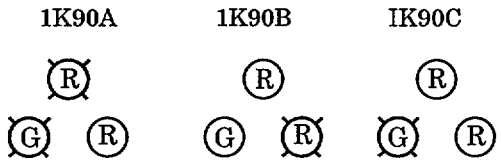
d. Yes; the "B" SFU will not automatically start until the "A" SFU cannot maintain the Control Room at a positive pressure.

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

1 Point

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

As the 1C05 operator, are you allowed to throttle closed on MO-1592 and MO-1636, A/B FEEDLINE BLOCK valves, to help control RPV level? (NO or YES)
If YES, identify the statement that correctly describes how these valves are controlled.

a. NO

b. YES; Close either MO-1592 or MO-1636 fully and then throttle the other valve as necessary to restore RPV level.

c. YES; MO-1592 or MO-1636 can be throttled closed but do not close or almost close them with a Feed pump running.
The MO valve positions are indicated on the 1C06 vertical board.

d. YES; MO-1592 or MO-1636 can be throttled closed but do not close or almost close them with a Feed pump running.
There is no indication of the MO valve positions other than the indicating lights which will be dual.

ANSWER: c

Distracter 1: ARP directs throttling these valves.

Distracter 2: Caution warns against closing a valve fully.

Distracter 3: Position indication is available on 1C06.

REFERENCE: ARP 1C05A, D-1

K/A System: 295008 (RPV High level)

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

K/A Value: 3.3/3.3

Objective: 45.01.01.01 (Relate the P&Ls of OI-639, OI-644, and applicable ARPs to Feedwater system operating status.)

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 equilize 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

1 Point

51. An EHC logic system failure while at power is causing Reactor pressure to rise.

As the 1C05 operator you observe the following indications:

- RPV pressure is 1050 and still rising.
- Annunciator 1C05B, D-4 REACTOR VESSEL HI PRESSURE ALARM has activated.
- APRM flux levels are rising.
- Annunciator 1C05B, A-6, ROD OUT BLOCK has activated.
- Annunciator 1C05A, A-2, "A" RPS AUTO SCRAM has activated.
- 3 of the 4 white lights in SCRAM GROUP A are OFF.

1) Would you be procedurally correct if you depressed the REACTOR MANUAL SCRAM **A** pushbutton without OSS permission and without referencing the 1C05A, A-2 ARP? (CORRECT or NOT CORRECT)

2) Would you be procedurally correct if you depressed the REACTOR MANUAL SCRAM **B** pushbutton without OSS permission and without referencing the 1C05A, A-2 ARP? (CORRECT or NOT CORRECT)

a. 1) CORRECT
   2) CORRECT

b. 1) NOT CORRECT
   2) CORRECT

c. 1) CORRECT
   2) NOT CORRECT

d. 1) NOT CORRECT
   2) NOT CORRECT

ANSWER:	a
Distracter 1:	Directed by ARP 1C05A, A-2, Step 3.5 and allowed by ACP 1410.1.
Distracter 2:	Directed by ARP 1C05A, A-2, Step 3.6.a and allowed by ACP 1410.1.
Distracter 3:	Directed by ARP 1C05A, A-2, Step 3.5 and Step 3.6.a and allowed by ACP 1410.1.
REFERENCE:	ARP 1C05A, A-2; ACP 1410.1
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:	93.22
Cognitive Level:	3-SPK
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. The "B" GEMAC Reference Leg Backfill system was out of service for 10 days when a reactor scram occurred.

- Operators quickly identified and corrected the cause of the scram and stabilized the plant.
- RPV pressure is currently 920 psig and being controlled by EHC.

Is enhanced RPV level monitoring per OI-880 Section J-1 required in this situation? (REQUIRED or NOT REQUIRED)

If REQUIRED, would operators expect to see "notching" in the current plant condition?
If NOT REQUIRED, identify why it is not required.

a. REQUIRED
Notching is expected in the current plant condition.

b. REQUIRED
Notching is NOT expected in the current plant condition.

c. NOT REQUIRED
A Reference Leg Backfill system must be out of service for longer than 14 days before enhanced RPV level monitoring is required.

d. NOT REQUIRED
Both Reference Leg Backfill systems must be out of service for longer than 7 days before enhanced RPV level monitoring is required.

ANSWER: b

Note: GEMAC instruments provide indication and RPV level control.

Distracter 1:Required is correct, but notching happens during cooldown/depressurization., not when stable.

Distracter 2&3: It is required whenever either is OOS for >7 days.

REFERENCE: IPOI-5 P&L 3; SD 880; OI-880

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:88.00.00.05 Explain how non condensible gasses coming out of solution can affect col leg level instruments, when this is expected to occur, and what methods are used to determine level after ED.

Cognitive Level: 2-RI

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

1 Point

55. Using the EHC Logic Control System diagram provided, select the correct response to the following EHC System conditions.

Throttle pressure	980
Pressure Setpoint	940
Load Limit	100%
Max Combined Flow Limiter	125%

a. The turbine will trip on reverse power.

b. The turbine will trip due to an overspeed condition.

c. The Load Limit will allow a maximum of 100% steam flow to the condenser.

d. All of the Turbine Control Valves will be open and at least one Bypass Valve will be open.

ANSWER: d

Distracter 1: This trip is initiated by 3.5 MWe signal with a 30 second time delay. Generator electrical output should not decrease.

Distracter 2: The turbine speed & acceleration control circuitry should maintain 1800 RPM.

Distracter 3: 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.

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

1 Point

56. A plant startup was in progress per IPOI 3. Reactor power was 75% when BOTH Recirc pumps were observed to be running back. The following annunciators were received among others:

1C04A, D-2, "A" RECIRC MG 20% OR 45% LIMITER IN EFFECT
1C04A, D-8, "B" RECIRC MG 20% OR 45% LIMITER IN EFFECT
1C05A, D-1, REACTOR VESSEL HI/LO LEVEL

RPV water level is currently 186" and rising rapidly. What is the probable cause and reason for this transient?

a. Feed flow transmitter failing to zero; prevent Recirc pump and Jet pump cavitation

b. Loss of one Reactor Feed pump causing level to initially drop to <186"; avoid the 170" scram

c. "A" Recirc pump Discharge Valve fails closed; prevent upward axial thrust on the thrust bearings

d. Recirc MG speed control signal failure; ensure that Recirc pump speed change is in the conservative direction

ANSWER:	b
Distracter 1:	Pump discharge valve closed is a 20% runback and would only affect one recirc pump.
Distracter 2:	Feed flow transmitter is a 20% runback and at 75% a loss of one feed flow transmitter should lower feed flow to 37.5%.
Distracter 3:	Loss of speed signal would lockup scoop tubes not a runback. (SD 264 page 34)
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:	2 RI
Source:	Modified from Exam Bank Question # 681

1 Point

57. HOW MANY Liquid Process Radiation Monitors are installed 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 flow to the Cooling Towers.

b. 2 Process Rad Monitors.
One monitors RHRSW flow to the Cooling Towers.
One monitors ESW flow to the Cooling Towers.

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

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

ANSWER: c

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 the two flows are always combined at the Process rad 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 method of detection.)

Cognitive Level: 1-S

Source: NEW

1 Point

58. Under which of the following scenarios is the reactor considered to be unstable and should be manually scrammed?

a. The reactor is operating in the exclusion zone with three APRMs showing 8% peak-to-peak swings that are stable.

b. The reactor is operating in the buffer zone and three APRMs show peak-to-peak swings of 6% and trending downward.

c. The reactor is operating in the buffer zone and two APRMs show peak-to-peak swings greater than normal and trending upward.

d. The reactor is operating outside the buffer zone with one APRM having peak-to-peak swings o 12% and trending downward.

ANSWER: c

Note: Scram required for "undamped oscillations greater than normal"

Distracter 1: APRM readings stable. AOP-255.2 Follow-up Action 4.b requires exit exclusion region by raising Recirc flow or inserting control rods

Distracter 2: APRM readings normal for this transient. AOP-255.2 Follow-up Action 4.b requires Solomon report and subsequent corrective actions.

Distracter 3: APRM readings normal for this transient. This is the proper region of the Power/Flow map to be operating in.

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: 1 D

Source: Exam Bank, Question # 2174

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 Poin

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 th ADS system or the LLS system is operating as expected and identify any actions that may be necessar 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. Which containment spray subsystems are 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: Procedural steps dictate which CAD spray header to inject with dependent on if you are venting containment from the Drywell or Torus.

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.

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 Contro 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 locks 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 Immediat 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 an the following: EMERGENCY GENERATORS)

K/A Value: 4.1/4.2

DAEC Objective: 19.00.00.03

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

Cognitive Level: 3 PEO

Source: Exam Bank

67. The 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.
- There are no rod blocks from causes other than POSSIBLE refueling interlock rod blocks.

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.

d. IS NOT possible.
A rod block will occur as soon as a control rod is selected no matter what the status of the mai 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 U 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 wil cause the Generator Backup Lockout Relay to energize, and an Open Circuit transfe of the Non-Ess Busses.

Distracter 3: Per AOP-302.1 page 3 sequence. Tripping the Generator Field Breaker open first wil 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: 3.8/4.1

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

1 Point

69. The reactor is shutdown and at normal operating temperature and pressure.

The "A" Loop of Drywell Cooling system is in a normal operating lineup.

The "B" Loop of Drywell Cooling system is in an unusual lineup:

- LOOP B Mode Switch is in STANDBY.
- All Recirculation fan handswitches are in AUTO.
- Drywell Cooling Well Water Supply and Return valves CV-5718B and CV-5704B are open.

1) Would a HIGH AIR OUTLET Temperature from the Drywell coolers cause the "B" Cooling Fans to switch to high speed? (YES or NO)

2) Would a HIGH WATER OUTLET Temperature from the Drywell coolers cause the "B" Cooling Fans to switch to high speed? (YES or NO)

a. 1) YES
   2) YES

b. 1) YES
   2) NO

c. 1) NO
   2) YES

d. 1) NO
   2) NO

ANSWER: a

Distractor 1, 2, 3: Per ARP 1C25A[B} A-4 & OI-760 P&L#4, All fans switch to High speed and isol valves open at 120°F cooler water out or 135°F air temp out.

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; REACOR 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

b. 2

c. 3

d. 4

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 Main Plant Intake Coils bypass valve opens to maximize cooling to the Drywell.

b. The Control Building Chillers bypass valve opens to shift the chiller heat load to ESW.

c. The Domestic Water Storage Tank supply valve closes to ensure all flow is into the essential loads.

d. The selected Condenser Air Cooling Coil isolates to remove the heat input from the Condenser Bay.

ANSWER: a

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: d

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 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

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. Low pressure ECCS pumps could lose NPSH and cavitate.

b. Introduction of air into the containment with the potential for deflagration conditions.

c. Design external pressure on the containment could be exceeded, resulting in containment failure.

d. Failure of the Torus to Drywell vacuum breakers to function, causing drywell spray operation to be prohibited.

ANSWER:	a
Distractor 1:	Drop in drywell pressure will isolate containment spray valves.
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 an effect of any EOP Curve or Limit.
Cognitive Level:	3 SPK
Source:	New Question

78. Which of the following is the MAXIMUM allowable torus water volume that must be maintained per Technical Specifications?

Torus water level must be maintained below ...

a. 10.11 feet (58,900 ft^3), during reactor operations in Modes 1, 2, and 3.

b. 10.43 feet (61,500 ft^3), during reactor operations in Modes 1, 2, and 3.

c. 13.5 feet (61,750 ft^3), during reactor operations in Modes 1, 2, 3, and Mode 5 when work is being done which has the potential to fill the vessel.

d. 16.0 feet (62,500 ft^3), during all Modes of reactor operations.

ANSWER: b

Distractor 1: 10.11 ft is the low level limit.

Distractor 2: 13.5 ft is the limit based on Torus to Drywell vacuum breaker operation.

Distractor 3: 16.0 ft is the top of the indicating range for Torus Water level and is the limit for venting.

REFERENCE: Technical Specifications 3.6.2.2

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: 42.00.00.02

State when the Primary Containment and Containment Atmosphere Monitoring and Control Systems are required to be operable by Technical Specifications and describe the bases of the Primary Containment and Containment Atmosphere Monitoring and Control System LCOs.

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.

At what Torus water level must Emergency Depressurization be performed and what is the basis for this level?

a. 4.5 ft.; the level at which it is still allowed to open SRVs

b. 5.8 ft.; the level at which HPCI exhaust becomes uncovered

c. 7.1 ft.; the level at which the Drywell downcomers are uncovered

d. 8.0 ft.; the level at which 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

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

- Reactor power 20% (slowly lowering)
- Reactor water level 150" (being intentionally lowered)
- Reactor pressure 880 psig (stable with MSIVs open)

The South CRD Module Area Radiation Monitor (ARM) 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 briefs the crew that EOP-3 has been 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 i 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.

Do operators have the capability of determining the actual radiation levels in the Reactor Building Vent Shaft? (YES or NO)
If YES, identify the LOCATION that these readings are taken.

a. NO

b. YES; The meter face on the monitors can be read in the Control Room backpanel area at 1C36 (SRM and IRM panel).

c. YES; The meter face on the monitors can be read in the Reactor Bldg. North side, on the mezzanine above the CRD Repair Room.

d. YES; The meter face on the monitors can be read in the Reactor Bldg. South side, on the mezzanine above the Transversing Incore Probe (TIP) Room.

ANSWER: c

Distracter 1: 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 2: Selected if candidate confuses RB Vent Shaft Rad Monitors with the Refuel Floor Exhaus Rad Monitors.

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

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

1 Point

84. The plant is in COLD SHUTDOWN with the vessel cavity flooded.

The "D" RHR Pump was operating in the Shutdown Cooling Mode for 6 hours.

30 minutes ago, the "B" RHR pump was started and the "D" pump was secured.

A tagging error has caused the "B" RHR pump to trip. The problem was quickly resolved and now the Shift Supervisor has directed you to perform a normal, not emergency, re-start of one of the RHR pumps.

Which of the following correctly describes the status of the RHR pumps and the number of starting attempts each one is allowed?

a. "B" RHR pump would be considered "HOT" and allowed 1 restart attempt.
"D" RHR pump would be considered "HOT" and allowed 1 restart attempt.

b. "B" RHR pump would be considered "COLD" and allowed 2 restart attempts.
"D" RHR pump would be considered "HOT" and allowed 1 restart attempt.

c. "B" RHR pump would be considered "HOT" and allowed 1 restart attempt.
"D" RHR pump would be considered "COLD" and allowed 2 restart attempts.

d. "B" RHR pump would be considered "COLD" and allowed 2 restart attempts.
"D" RHR pump would be considered "COLD" and allowed 2 restart attempts.

ANSWER: a

Distracter 1, 2, & 3:Both are hot having been running within the previous hour.

REFERENCE: AOP-149 and OI-149

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

K/A Number: AA1.02 (Ability to operate and/or monitor the following as they apply to Loss of Shutdown Cooling: RHR/SHUTDOWN COOLING.)

K/A Value: 3.5/3.5

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

Cognitive Level: 1-P

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 th ARM System is operating as expected, and identify any actions that may be necessary to place the ARM System in the correct lineup.
Cognitive Level:	2-RI
Source:	Exam Bank

86. 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

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.

Does the placekeeping /logkeeping on the attached page comply with plant procedures? (YES or NO)

If NO, identify the CORRECT reason it is not in compliance.

a. YES

b. NO; IPOI-2 steps may NOT be marked N/A (Not Applicable).

c. NO; The correction in step (b)1 was NOT performed properly.

d. NO; 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 must be initialed or signed.

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

1 Point

89. The plant is in a refueling outage.

A Nuclear Station Operating Engineer (NSOE) has been dispatched from the Work Control Center to return a Standby Diesel Generator to standby readiness after an engine overhaul. The NSOE identifies that the STARTING AIR PRESSURE LOW annunciator is in solid and confirms that the Diesel Air Compressor Starting Air receiver pressure is low.

The NSOE decides to start the Diesel Air Compressor and looks in Standby Diesel Generator OI-324 but cannot find a procedure for this activity. The NSOE is fairly certain that he knows how to start the compressor, and he does so successfully without a procedure.

Has the NSEO in the above postulated scenario complied with ACP 101.01, "Procedure Use and Adherence" and with ACP 1410.1, "Conduct of Operations"?

a. COMPLIED; This is a "Skill of the Craft" activity which does not require procedure use.

b. COMPLIED; A procedure usage level cannot be defined if there is no procedure in the Operating Instructions.

c. DID NOT COMPLY; There is a procedure for this activity. The "Reference Use" level of procedure adherence is applicable but was not applied.

d. DID NOT COMPLY; There is a procedure for this activity. The "Continuous Use" level of procedure adherence is applicable but was not applied.

ANSWER: c

Note: Step 3.3(4) states that if there is any doubt as to procedural action, the procedure shall be present (Reference use) and ACP 1410.1 explicitly lists ARPs as "Reference Use". The Applicable procedure steps are in ARP 1C93/94 C-2, and are hidden in OI under place in standby readiness.

Distracter 1: "Skill of the craft" is easily mis-applied. ACP 1410.1 Step 3.7(9) lists activities, not examples of activities that can be considered "Skill of the craft". Steps in ARP require Reference usage
Distracter 2: Steps are hidden in OI under "Place in standby readiness". Steps are in ARP and require Reference usage.
Distracter 3: Plausible if the definition of "Continuous Use" is not understood. ACP 1410.1 specifies ARPs as "Reference Use".

REFERENCE: ACP 101.01; ACP 1410.1

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: Exam Bank (New for LOR 00C6W4)

90. See the attached RPV instrumentation schematic of 1C56 on the next page.

Given:

- PI-4553 provides indication only.
- PS-4549 provides a protective function.

Are there any prerequisite conditions for venting PI-4553 based on its instrument line connections (NO Conditions or SOME Conditions)

If there are SOME prerequisite conditions for venting PI-4553 based on its instrument line connections, are they:

MORE Restrictive,

LESS Restrictive,

or the SAME Restrictions

when compared to PS-4549?

a. PI-4553 can be vented with NO restrictions.

b. SOME prerequisite conditions.
MORE Restrictive than PS-4549.

c. SOME prerequisite conditions.
LESS Restrictive than PS-4549.

d. SOME prerequisite conditions.
The SAME Restrictions as PS-4549.

ANSWER: D
REFERENCE: ACP 1410.1 Conduct of Ops, Section 3.9 (8)-(11); SD 880
Note: Question is based on a plant event. PS-4549 provides high pressure scram signal. However, the point of the question is that both instruments share a common instrument leg with instruments that have protective functions and thus require an approved procedure.
Distracter 1, 2, & 3: Both require OSS/OSM concurrence and an approved procedure because they are on the same sensing line.

K/A System: 2.1
K/A Number: 2.1.1 (Knowledge of Conduct of Operations requirements.)
K/A Value: 3.7/3.8
Objective: Industry Events

Cognitive Level: 3-SPK

Source: Revised, Exam Bank

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 at EOC 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

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 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 evolution 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. Are the following items a responsibility of a Reactor Operator in complying with ACP 1411.1, "The ALARA Emphasis Program"? (YES or NO)

1) Follow Radiation Protection procedures.

2) Implement measures to minimize dose while conducting activities within the controlled areas.

3) Make recommendations to improve the ALARA Emphasis Program.

a. 1) YES
2) YES
3) YES

b. 1) YES
2) YES
3) NO

c. 1) YES
2) NO
3) YES

d. 1) NO
2) YES
3) YES

ANSWER: a

Distracter 1, 2, & 3: All 3 are either RAD worker or Every Individual responsibilities.

REFERENCE: ACP 1411.1, The ALARA Emphasis Program

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 F

Source: Revised

1 Point

96. An individual radiation worker has exposure history as follows:

Date of Birth:	8/29/63
Lifetime Exposure:	36 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

1 Point

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.

Shortly after that, RPV level began to lower for no known reason. 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 (Near the door by the Fire Panel). You are too far away to read the annunciator.

Could this be a high priority annunciator?

a. 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.

b. Yes; The annunciator could be a high area RADIATION EOP-3 entry condition.

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

Distracter 1: 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 this event.

Distracter 2: Hi Area Radiation is an EOP-3 entry condition, but this annunciator is on panel 1C04B.

Distracter 3: Hi Area Temps is an EOP-3 entry condition, but this 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

1 Point

100. The plant has experienced an accident that required an entry into EOP 3. One area had exceeded its Max Safe Operating 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 1 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.

Has the operator in the above postulated scenario acted correctly?

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

b. No, The operator is NOT allowed to perform this procedure from memory.

c. No, The operator is required to start the second EHC pump before opening the Bypass Valves.

d. No, 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