INITIAL SUBMITTAL OF THE RO WRITTEN EXAMINATION

FOR THE DUANE ARNOLD EXAMINATION - NOVEMBER 2002

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information	
Name:	Region: I / II / III / IV
Date:	Facility/Unit:
License Level: RO / SRO	Reactor Type: W / CE / BW / GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

NMC Committed to Nuclear Excellence	WRITTEN EXAMINATION KEY COVERSHEET

Training program: Reactor Operator		**Course/lesson plan Number(s): 50007**
Examination Number/Title: 2002 ILC RO Written Exam		
GRADE:		
Total Points Possible: 100	**PASS CRITERIA: ≥ 80%**	**Exam Time:**
EXAMINATION REVIEW AND APPROVAL:		
Submitted by:		**Date:** 9/20/2002
Reviewed by:		**Date:** 9/20/2002
Approved by:		**Date:** 9/20/2002

Written Examination key

Attach answer key to this page.

Key should contain the following:

- Enabling Objective Number
- Test Item
  - Question or Statement
  - All possible answers
  - Correct Answer Indicated
  - Point Value
- References

Indicate in the following table if any changes are made to the exam after approval:

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	PREPARER / REVIEWER	DATE / DATE

NMC Committed to Nuclear Excellence	WRITTEN EXAMINATION COVERSHEET

TRAINEE INFORMATION:			
Name:		**Job Title:**	
Employee Number:		**Site:**	**DAEC**
Training program: Reactor Operator		**Course/lesson plan Number(s): 50007**	
Examination Number/Title: 2002 ILC RO Written Exam			
GRADE:			
Total Points Possible: 100	PASS CRITERIA: ≥ 80%	**Grade:** ____/____=____%	
Graded by:		**Date:**	
Co-graded by (not required if Scantron graded):		**Date:**	

EXAMINATION RULES

1. References may not be used during this examination, unless otherwise stated.
2. Read each question carefully before answering. If you have any questions or need clarification during the examination, contact the examination proctor.
3. Conversation with other trainees during the examination is prohibited.
4. Partial credit will not be considered.
5. Rest room trips are limited and only one examinee at a time may leave.
6. Ensure you have answered each item prior to turning in your exam.
7. For exams with time limits:
   a. You have _____ minutes to complete the examination.
   b. The proctor will collect all examinations after this time expires.

EXAMINATION INTEGRITY STATEMENT

Dishonesty Policy: Cheating or compromising the exam will result in disciplinary actions up to and including termination.

"I have not given, received, or observed any aid or information regarding this examination prior to or during its administration that could compromise this examination's integrity."

Examinee's Signature: _____ **Date:** _____

REMEDIATION ACKNOWLEDGEMENT

"I acknowledge that the correct answers to the exam questions were indicated to me following the completion of the exam. I have had the opportunity to review the examination questions with the instructor to ensure my understanding.

Examinee's Signature: _____ **Date:** _____

NMC
Committed to Nuclear Excellence

WRITTEN EXAMINATION COVERSHEET

Training program: Reactor Operator	**Course/lesson plan Number(s): 50007**
Examination Number/Title: 2002 ILC RO Written Exam	

1 Point

1. The plant is at 90% power when a Turbine trip occurs.

Which of the following plant responses is correct?

a. A pressure switch in the air header to the Extraction Steam Valves down stream of the Turbine Extraction Relay Dump Valve senses a low pressure and sends a CLOSED signal to MO-9147 and MO-9148 "MSR 1E-18A and B 2nd Stage Reheat Steam High Load Isolation Valves".

b. A pressure switch in the air header to the Extraction Steam Valves down stream of the Turbine Extraction Relay Dump Valve senses a low pressure and sends a CLOSED signal to CV-1106 and CV-1363 "HP Heater 1E6 A and B Drain Bypass Valves".

c. Air pressure in the air header to the Extraction Steam Valves down stream of the Turbine Extraction Relay Dump Valve is bled off causing CV-1106 and CV-1363 "HP Heater 1E6 A and B Drain Bypass Valves" to go CLOSED.

d. Air pressure in the air header to the Extraction Steam Valves down stream of the Turbine Extraction Relay Dump Valve is bled off causing CV-1237 "High Pressure Extraction Drain to Condenser Valve" to go CLOSED.

ANSWER:	a
Answer:	The reason the MSRs isolate on a Turbine Trip is because PS1097 in the air header to the Extraction Steam Valves down stream of the Turbine Extraction Relay Dump Valve senses the turbine trip and sends the closed signal to MO-9147 and MO-9148. IAW IPOI 5 verification is required by the operator.
Reference:	SD 646 Rev 5 page 20, IPOI 5 Rev 33 step 3.3 (4) (b) page 6
Distracter 1:	Plausible because these valves require closing after a scram. However, there is no auto closed signal. These valves require manual action to close. IPOI 5 Rev. 33 step 3.3 (6) (a and b) page 7.
Distracter 2:	Plausible because these valves require closing after a scram. However, there is no auto closed signal. These valves require manual action to close. IPOI 5 Rev 33 step 3.3 (6) (a and b) page 7.
Distracter 3:	Plausible because this valve is in the airline from the Extraction Relay Dump Valve. However, this is a fail open valve.
K/A System:	295005 Main Turbine Generator Trip
K/A Number:	AK3.05 Knowledge of the reason for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: Extraction steam/moisture separate isolations
K/A Value:	2.5/2.6
DAEC Objective Number:	46.00.00.07
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the Extraction Steam and Feedwater Heating system is operating as expected, and identify any actions that may be necessary to place the Extraction Steam and Feedwater Heating system or the plant in the correct condition

Cognitive Level: 2RI - The candidate has to know the extraction dump valve will vent the air header to the pressure switch. This occurs due to EHC system actuation due to a turbine trip signal. They then need to understand this will generate a closed signal to the MSR high load valves and if the valves do not close the operator is directed in IPOI 5 to close them.

Source: New

Operationally Validity: Required actions after a scram and turbine trip

OE: MSR failed to fully isolate on recent scram.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

2. A Reactor SCRAM has occurred and has **NOT** been reset.

   The OSS directs you to perform IPOI 5 "Reactor Scram" and verify all control rods fully inserted. The Full Core Display shows 4 control rods with their green FULL IN lights OFF.

   IAW IPOI 5 "Reactor Scram", what other method is allowed to verify all control rods are fully inserted?

   a. Requesting a Rod Log
   b. Check SPDS for ALL RODS IN
   c. Use of Refuel One Rod Selected Permissive
   d. Check the rods are at position 00 on the Four Rod Display

ANSWER:	c
Answer:	Refuel One-Rod Selected Permissive is the only other authorized method to verify all control rods have fully inserted IAW IPOI 5. This condition occurred at DAEC due to burned out light bulbs. At that time the only method to verify all rods in was to see all Green Full In lights on. The second method was subsequently added to IPOI 5.
REFERENCE:	IPOI 5 Rev 33 step 3.2 (6) (a)
Distracter 1:	This is plausible because normally if you want to know rod position you are directed to request a Rod Log in several procedures. However, the Rod Log will indicate -99 for all rods because they are beyond 00 and not authorized in IPOI 5.
Distracter 2:	This is plausible because SPDS does indicate ALL RODS IN. However, this is not an approved method to determine that all rod are inserted
Distracter 3:	This is plausible because the Four Rod Display shows rod position. However, with the scram not reset the display will be blank because the rods are beyond position 00.
K/A System:	295006 Scram
K/A Number:	AA2.02 Ability to determine and/or interpret the following as they apply to scram: Control Rod Position.
K/A Value:	4.3/4.6
DAEC Objective Number:	93.22.01.09
DAEC Objective Statement:	Explain how to verify all rods in with the Refuel One Rod Select Permissive switch
Cognitive Level:	1P – This is a procedure step in IPOI 5
Source:	New
Operationally Validity:	This is a required operator action for a scram
OE:	Yes ATWS was entered at DAEC in the past before we could use the Refuel One Rod Selected Permissive due to failed light bulbs.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

3. A plant transient has occurred and ALC has been entered.
The following conditions currently exist:

- All rods are in
- Reactor Pressure has been stabilized at 550 psig
- RPV level is +70 inches and lowering at 10 inches/min.
- All available high pressure injection sources are injecting at maximum flow
- RHR is being used to spray the Torus and Drywell
- Drywell pressure is 3 psig and holding steady

The OSS orders the panel operator to line up and maximize injection with RHR and Core Spray.
The 1C03 operator verifies the "A" Core Spray pump is running and MO-2115 "Outboard Inject Valve" is OPEN.
The operator then attempts to OPEN MO-2117 "Inboard Inject Valve" to maximize flow but the valve will **NOT** OPEN.

Which of the following would explain these conditions?

a. The Core Spray Automatic Initiation signal does **NOT** exist with these conditions. When RPV level drops to the Core Spray Initiation setpoint the operator will be able to OPEN the valve.

b. Valve logic prevents simultaneously OPENING both Inboard and Outboard Inject Valve at this time to prevent over pressurizing the low pressure Core Spray piping.

c. The differential pressure across the valve is too high. The Outboard Inject valve will need to be CLOSED and the Inboard Inject valve cracked off its closed seat. Then both valves can be OPENED.

d. The "A" SBDG logic has failed to provide an OPEN permissive to the Core Spray Inject valve logic. The operator should verify the "A" SBDG is running.

ANSWER:	b
Answer:	There is a valid initiation signal at this point (>2 psig DW). The valve is still closed because the 450 psig permissive has not been reached. With RPV pressure >450 psig only one inject valve at a time can be opened to protect low pressure Core Spray piping.
REFERENCE:	SD 151 Rev 5, ARP 1C 03B B-5 Rev 2
Distracter 1:	This is a plausible choice if because the 64 inch initiation setpoint has not been reached. There is a valid initiation signal at this point (>2 psig DW). However, the valve is still closed because the 450 psig permissive has not been reached.
Distracter 2:	This is a plausible choice because there is a higher than normal DP across the valve. However, the valve is still closed because the 450 psig permissive has not been reached.
Distracter 3:	This is a plausible choice because the Core Spray and SBDG logic do have a connection. However, the Core Spray logic sends a signal to the SBDG logic to start. The valve is still closed because the 450 psig permissive has not been reached.
K/A System:	295007 High Reactor Pressure
K/A Number:	AK 2.04 Knowledge of the interrelationships between HIGH REACTOR PRESSURE and the following: LPCS

K/A Value:	3.2/3.3
DAEC Objective Number:	4.02.01.10 a
DAEC Objective Statement:	Describe the Core Spray System interlocks, including purpose, setpoints, logic, and when/how they are bypassed. a. Pump and Valve Interlocks
Cognitive Level:	3SPK The problem is that the injection valves will not open and the operator must determine what is the cause of the system conditions. System interlocks for overpressure protection is preventing the valve operation.
Source:	New
Operationally Validity:	System knowledge and proper system response for ECCS systems.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

4. The plant was operating at 92% power.
A plant transient occurred requiring a Manual SCRAM.
An electrical ATWS was entered due to failure to SCRAM conditions.
Defeat 15 "MSIV and MSL Drain LO-LO-LO Level Isolation Defeat" is installed.
Reactor power has stabilized at 4%.
RPV water level is 135 inches and steady.
The Main Turbine is still on line.
At 0910 a steam leak is detected in the Steam Tunnel reading 180°F and increasing at 10°F per minute.

   Which of the following will occur if no operator action is taken and the above conditions continue?

   a. At 0912 power will increase due to a rapid rise in RPV pressure.

   b. At 0912 a Group 1 signal will occur. However, power will not be affected due to installation of Defeat 15.

   c. At 0922 the MSIVs will close causing power to increase.

   d. At 0922 the Main Turbine will trip. However, the Bypass Valves will maintain power stable at 4%.

ANSWER:	a
Answer:	A Group 1 will occur at 200°F and the MSIVs will close. This will induce a large pressure increase in the RPV and add positive reactivity to the core. The candidate will have to predict the pressure increase based on MSIV closure and the resulting power excursion.
REFERENCE:	EOP Bases ATWS – RPV Control Rev 7 pages 6, 53, and 60.
Distracter 1:	A group 1 will occur at 0912. However, Defeat 15 will not prevent the MSIV closure on the High Steam Tunnel Temperature. This is a common error made with Defeat 15. It only prevents closure of MSIV on water level. The other isolation signals still occur.
Distracter 2:	Power will increase. However, the MSIVs would have closed at 0912 when Steam Tunnel Temperature reached 200°F. This corresponds to EOP 3 300°F max safe Steam tunnel temperature which is sometimes confused with the 200°F trip setpoint.
Distracter 3:	The Main Turbine would probably tripped by this point and 4% power is well within the Bypass Valve capacity. However, The MSIVs will be closed and the Bypass valves would have no effect. The candidate may assume that defeat 15 has kept the MSIVs open.
K/A System:	295007 High Reactor Pressure
K/A Number:	AA2.02 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: Reactor power.
K/A Value:	4.1/4.1
DAEC Objective Number:	95.56.08.04 95.56.01.02 48.01.01.01

DAEC Objective Statement:	Explain the effects, on plant systems or components, of the inability to control reactor pressure with the bypass valves during an ATWS condition Differentiate between the pressure control strategies of EOP 1 and ATWS Describe how the Main Steam System responds to a Group 1 isolation signal
Cognitive Level:	3PEO – The Candidate has to predict a pressure increase and the effect on power.
Source:	New
Operationally Validity:	Effects of pressure increase on Reactor power during ATWS conditions.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

5. A SCRAM occurs from full power.

The following actions occur:
- All RHR (LPCI) and Core Spray Pumps START
- Primary Containment Group 1 **and** Group 7 valves CLOSE
- The "A" and "B" SBDGs START
- The ADS Timers START

Which one of the following would account for this set of indications?

a. Loss of 1A3 and 1A4 essential busses.

b. Drywell Pressure has reached its Hi pressure trip setpoint 2 psig.

c. RPV water level has reached its LO-LO level trip setpoint 119.5 inches.

d. RPV water level has reached its LO-LO-LO level trip setpoint 64 inches.

ANSWER:	d
Answer:	All these action occur at 64 inches RPV level IAW ARP 1C05 A-1. The candidate must interpret from the conditions that level has dropped below 64 inches in the RPV.
REFERENCE:	ARP 1C05 A-1 Rev 5
Distracter 1:	This is a plausible choice because the SBDGs both start if a Group 1 occurs, also Loss of RPS will give a false LO-LO-LO RPV level annunciator and drywell 2 psig annunciator. However, ADS times will not initiate. RHR and Core Spray pumps load shed.
Distracter 2:	This is a plausible choice because several systems that start at 64 inches RPV level also start on 2 psig Drywell pressure. However, ADS does not start and Group 1 and 7 do not occur.
Distracter 3:	This is a plausible choice because lower RPV level auto starts several systems. LPCI LOOP selects at this level.
K/A System:	295009
K/A Number:	AA2.01Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL: Reactor water level
K/A Value:	4.2/4.2
DAEC Objective Number:	42.08.01.07
DAEC Objective Statement:	List the signals, which cause Primary Containment and Containment Atmosphere Monitoring and Control System isolations. Describe their purpose, setpoints, and logic. Describe how they are bypassed and how they are reset
Cognitive Level:	2DR – The candidate has to recognize the relationship between RPV LO-LO -LO level (64 inches) and various system responses based on that level dropping below the setpoint.
Source:	New
Operationally Validity:	EOP break points and ARP actions. EOP actions required by operators
OE:	There have been occurrences of systems not responding on isolation signals and thus requiring operator action to compensate for the failure.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

6. **Review the indication given in the Support Material Booklet**

The plant was at power.
10 minutes ago annunciator 1C04C D-3 "Drywell Equip Drain Sump Hi Temp" alarmed followed shortly by 1C04C C-3 "Drywell Equip Drain Sump Hi Leakage.
The ARP automatic actions occurred properly with 1P37B "B DW Equipment Drain Pump" RUNNING recirculation through the 1E-34 "DW Equipment Drain Sump HX".
The STA reports Drywell pressure rising.

Drywell pressure has reached 3.5 psig and is slowly rising.
Annunciator 1C04C B-1 "Drywell Equipment Drain Sump HI-HI Level is in alarm.
You observe the Drywell Drain system indications shown on the next page.

Which action is correct for the current plant conditions?
(Assume indicated annunciators are still in alarm)

a. Take HS for CV-3728 and CV-3729 "Drywell Equipment Drain Sump Isolation Valves" to CLOSED and check that both 1P37A and 1P37B AUTOMATICALLY STOP.

b. Take HS for 1P37A and 1P37B to STOP and check CV-3728 and CV-3729 "Drywell Equipment Drain Sump Isolation Valves" AUTOMATICALLY CLOSE.

c. Take HS for CV-3728 and CV-3729 "Drywell Equipment Drain Sump Isolation Valves" to CLOSED and check that 1P37A **and** 1P37B remain RUNNING.

d. Take HS for CV-3728 and CV-3729 "Drywell Equipment Drain Sump Isolation Valves" to CLOSED and check that 1P37A **or** 1P37B remains RUNNING.

ANSWER:	a
Answer:	At 2 psig in the drywell a group 2 isolation will close CV-3728 and CV-3729 Drywell Equipment Drain Discharge valves. This will trip 1P37A and 1P37B if running. In the given plant conditions the Group 2 has failed to occur and with the Hi-Hi sump level both pumps will be running. The correct operator action is to complete the isolation that failed.
REFERENCE:	SD 920.1 Rev 3 pages 11-14, ARP 1C04C B-3/C-3/D-3 Revs.4/4/5. 1C05B B-1 Rev 6.
Distracter 1:	There is an interlock between the isolation valves and the sump pumps. However, the interlock is that if the valves close the pumps trip not the other way round.
Distracter 2:	With a Hi-Hi sump level still in alarm there will be a signal for both sump pumps to be running. However, because there is a group 2 signal the isolation CVs should have closed and the interlock between the isolation valves and the sump pumps will override the Hi-Hi level alarm signal.
Distracter 3:	With a Hi sump temperature still in alarm there will be a signal for at least one sump pump to be running. However, because there is a group 2 signal the isolation CVs should have closed and the interlock between the isolation valves and the sump pumps will override the Hi temp alarm signal.
K/A System:	295010
K/A Number:	AA1.02 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: Drywell Floor and Equipment Drain Sumps
K/A Value:	3.6/3.6

DAEC Objective Number:	89.03.01.06
DAEC Objective Statement:	Describe the Drywell Sump system interlocks, including purpose, setpoints, pump and valve logics
Cognitive Level:	2RI – The operator must determine the correct expected system response for the Drywell sump system when a Group 2 PCIS isolation occurs at 2 psig.
Source:	New
Operationally Validity:	Required action to verify automatic action and isolations complete
OE:	During a recent SCRAM the sump system had a system malfunction which was caught by the operating crew and was incorporated into lessons learned during LOR Requal training.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

7. The plant is at full power.

You are the 1C05 operator and notice the following indications:

- Reactor power on the APRMs is noted to be slowly rising.
- Main Generator load is rising.
- Final Feedwater temperature is lowering.
- Condenser backpressure has risen.

Which of the following would account for this set of indications?

a. CV-1139 "Feedwater Heater 1E-5A Dump to Condenser" is OPEN.

b. CV-1158A "HP Turbine Extraction Steam Outlet to 1E-6A" is OPEN.

c. MO-1546 "LP Feedwater Heater Bypass Isolation Valve" is CLOSED.

d. CV-1237 "High Pressure Turbine Extraction Steam Bypass Valve " is CLOSED.

ANSWER:	a
Answer:	The indications given are for a positive reactivity addition event.CV-1139 being open will cause a loss of feed water heating which will increase inlet subcooling and add positive reactivity to the core.
REFERENCE:	SD 646 Rev 5 pages 37 and 47. SD 644 Rev 5 page 42. OI 646 Rev 33 page 4. AOP 255.2 Rev. 22 page 4.
Distracter 1:	CV 1158 could cause the indications given. However, the valve would have to go closed. Open is the normal position of this valve.
Distracter 2:	MO-1546 could cause the indications given. However, the valve would have to be open. Closed is the normal position of this valve.
Distracter 3:	CV-1237 could cause the indications given. However, the valve would have to be open. Closed is the normal position of this valve.
K/A System:	295014 Inadvertent Reactivity Additions
K/A Number:	AA1.07 Ability to operate and/or monitor the following as they apply to INADVERTENT REACTIVITY ADDITIONS: Cold water injection
K/A Value:	4.0/4.1
DAEC Objective Number:	46.00.00.07
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the Extraction Steam and Feedwater Heating system is operating as expected, and identify any actions that may be necessary to place the Extraction Steam and Feedwater Heating system or the plant in the correct condition
Cognitive Level:	2RI
Source:	Bank – Slightly modified.
Operationally Validity:	AOP actions to identify cause of loss of Feedwater heating..
OE:	DAEC and other plants have experienced a loss of Feedwater Heating.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

8. An electrical ATWS has occurred with reactor power remaining at 7%.

The 1C05 operator is directed to manually drive control rods.

1) Should the Rod Worth Minimizer be PLACED IN BYPASS or should it REMAIN IN OPERATE?
AND
2) What is the CORRECT reason for the answer to part 1 of this question?

a. 1) PLACED IN BYPASS
2) To disable possible Select Blocks.

b. 1) PLACED IN BYPASS
2) To disable possible Insert Blocks.

c. 1) REMAIN IN OPERATE
2) To enforce insertion of the highest worth rods FIRST.

d. 1) REMAIN IN OPERATE
2) To transmit rod positions to the Plant Process Computer.

ANSWER:	b
Answer:	If bypass is not selected the rods will not fully insert.
REFERENCE:	EOP Bases, ATWS Rev. 7, page 87; SD 878.8 Rev 5 page 33; RIP 103.3 Rev 3 page 1
Distracter 1:	Select blocks come from RSCS.
Distracter 2:	Placed in Bypass per RIP 103.3. RWM enforcement is not desirable.
Distracter 3:	Placed in Bypass per RIP 103.3. RWM does not transmit to PPC.
K/A System:	295015 Incomplete SCRAM
K/A Number:	AK3.01 Knowledge of the reasons for the following responses as they apply to INCOMPLETE SCRAM: Bypassing rod insertion blocks.
K/A Value:	3.4/3.7
DAEC Objective Number:	95.00.00.20
DAEC Objective Statement:	For any step from EOP Support Procedures: 1. Explain the basis for the statement 2. Explain how it accomplishes the goals of EOP Support Procedure
Cognitive Level:	1-B – The purpose of the Bypass feature is to allow rod motion outside the programmed sequence which is necessary under these conditions.
Source:	Bank – 1999 RO Exam, 2001 RO Audit Exam
Operationally Validity:	Operator action required to shutdown the reactor as directed in the EOPs.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

9. As primary containment pressure exceeds 55 psig, which of the below correctly describes the operational implications of this pressure?

   a. The containment vent valves will not open due to high delta pressure.

   b. The HPCI malfunctions due to high backpressure.

   c. The SRVs will not remain open.

   d. Containment failure.

ANSWER:	d
Answer:	For DAEC the PCPL has been derived from several curves and determined to be 53 psig for pressure and 95 ft water level in containment.
REFERENCE:	EOP Bases Document Curves and Limits B.5 Rev 5 page 35-40
Distracter 1:	The vent valves are a concern at 56 psig. However, the pressure in containment at this pressure has exceeded the PCPL of 53 psig.
Distracter 2:	RCIC will trip at 50 psig containment backpressure. However, HPCI trips at 150 psig. RCIC and HPCI set points are often confused because several set points are the same.
Distracter 3:	SRVs take about 50 psig between RPV pressure and containment pressure to operate. They will open at a higher RPV pressure than normal, in this case about 105 psig.
K/A System:	295024 High Drywell Pressure
K/A Number:	EK1.01 Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: Drywell integrity
K/A Value:	4.1/4.2
DAEC Objective Number:	95.00.00.18
DAEC Objective Statement:	Evaluate the possible consequences of exceeding any EOP Curve or Limit on the mitigation of an event
Cognitive Level:	1B – The **containment design** limit is the bases for the 53 psig setpoint.
Source:	Bank 1998 NRC Exam
Operationally Validity: OE:	Primary containment failure criteria and operators knowledge of EOP breakpoints.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

10. The plant is at full power when annunciator 1C07A B-4 "EHC Fluid reservoir 1T-33 LO Level" is received.
The in-plant operator reports an unisolable EHC leak.
The OSS directs Reactor SCRAM and IPOI 5 actions to be carried out.
EOP 1 is entered on LO RPV water level after the SCRAM.
The OSS then directs securing both EHC pumps.

Which of the following is correct concerning Bypass valve operation for this event and subsequent Reactor pressure control?

a. Bypass Valve operation will **NOT** be available for long term RPV pressure control under these conditions. ADS/SRVs, HPCI, or RCIC can be used for RPV pressure control.

b. The Bypass Valves will **NOT** control with Pressure Set. However, the Bypass Valve Opening Jack will still function.

c. The installed Bypass Valve accumulators provide 30 minutes of Bypass Valve operation. At this point decay heat will be within the capacity of the MSL Drain Valves.

d. The Bypass Valves will **NOT** be available for RPV pressure control. Use Chest Warming to control RPV pressure until decay heat is within the capacity of the MSL Drains.

ANSWER:	a
Answer:	With loss of EHC header pressure the Bypass Valves have about 40 seconds accumulator reserve before the valves go closed. The Bypass Valves will be unavailable for RPV pressure control for EOP 1. Reactor pressure will increase to the high pressure setpoint and LLS will be the pressure control system unless operator action is taken to control pressure.
REFERENCE:	SD 693.2 Rev3 page 43, EOP 1
Distracter 1:	This is a plausible choice because the valves will not respond to pressure set and we do use The Bypass Valve Opening Jack in the EOPs. However, EHC pressure is required.
Distracter 2:	This is a plausible choice because there are accumulators installed in the plant for 30-min. operations. However, this is not the case with loss of EHC header pressure the Bypass valves. They have about 40 seconds accumulator reserve before the valves go closed.
Distracter 3:	Chest warming would reduce pressure. However, with the loss of EHC pressure the valves used for chest warming will not open.
K/A System:	295025 High Reactor Pressure (EOP)
K/A Number:	EK2.08 Knowledge of the interrelationships between HIGH REACTOR PRESSURE and the following: Reactor/turbine pressure regulating system.
K/A Value:	3.7/3.7
DAEC Objective Number:	95.46.09.08
DAEC Objective Statement:	Explain the effects, on plant systems or components, of the inability to stabilize reactor pressure with the bypass valves.
Cognitive Level:	1I – The candidate has to determine the system response to a loss of EHC pressure.
Source:	New

Operationally Validity: EHC system response and system knowledge.

OE: Yes – DAEC has experienced this event.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

11. The Plant is at 90% power.
ATWS conditions have occurred.

Which of the following is correct with regard to automatic initiation of "ATWS ARI/RPT" and what does this accomplish?

Actions are automatically initiated ...

a. at 119.5 inches RPV Water Level which rapidly reduces power due to a rapid increase in voids.

b. at 1055 psig RPV Pressure which OPENS (vents to atmosphere) the ARI solenoid valves, depressurizing the Scram Air Header.

c. at <90% OPEN on the Turbine Stop Valves which rapidly reduces power due to a rapid increase in voids.

d. on a "Fast Closure Signal" to the Turbine Control Valves which OPENS (vents to atmosphere) the ARI solenoid valves, depressurizing the Scram Air Header.

ANSWER:	a
Answer:	At 119.5 inches the ATWS ARI/RPT will trip the Recirc pump RTP breakers open. This will cause the core to void adding negative reactivity to the core and causing a large power reduction.
REFERENCE:	SD 264 Rev 6 pages 43-47.
Distracter 1:	The ARI solenoid valves open on an ATWS ARI/RPT trip. However, the ATWS ARI/RPT RPV pressure setpoint is 1140 psig. 1055 is the SCRAM setpoint for RPS.
Distracter 2:	TSV closure to <90% will cause an RPT and power reduction due to voids. However, this is an EOC RPT for thermal limit protection and not an ATWS trip.
Distracter 3:	On a fast closure of the TCVs an RPT trip will occur and the ARI solenoid valves do open. However, this is an EOC RPT for thermal limit protection and not an ATWS trip.
K/A System:	295031 Reactor Low Water Level
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
DAEC Objective Number:	12.00.00.03c 12.01.01.12
DAEC Objective Statement:	Describe the operation of the following principle Recirc system components: c. RPT breakers Describe the Recirc system interlocks, including purpose, setpoints, logic, and when/how they are bypassed
Cognitive Level:	1I
Source:	New
Operationally Validity:	System knowledge

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

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TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

12. A Group 1 isolation and ATWS have occurred from full power.

    - Reactor power was 15% after the Recirc pumps were tripped.
    - LLS is controlling RPV pressure.
    - RPV injection was terminated and prevented for Level/Power Control.

    As the 1C05 operator, you CLOSED the Feed Reg Valves and are monitoring critical parameters. You report the following parameters to the OSS:

    - RPV level is at 150".
    - Reactor power is at 2%.

    At this point the OSS directs you to reestablish injection with feedwater.

    Is this direction correct? (YES or NO)
    If YES, identify the reason it is correct.
    If NO, identify the additional considerations necessary to reestablish injection.

    a. YES
    Injection may be reestablished when power lowers to <5%. There is no restriction on RPV level.

    b. YES
    Injection may be reestablished when power lowers to <5% and RPV level is <158".

    c. NO
    Injection must remain terminated until RPV level lowers to less than +119.5".

    d. NO
    Injection must remain terminated until RPV level lowers to less than +87".

ANSWER:	d
Answer:	This is a recent change to the Level/Power control strategy. A 1C05 operator should know that level must be lowered to < +87" in this situation.
REFERENCE:	ATWS /L-1 & 2 Rev 10. DAEC EOP Bases Document Rev 7 ATWS – RPV Control page 25 – 34.
Distracter 1:	Reactor level must be < +87" and power <5% to re-establish injection.
Distracter 2:	Reactor level must be < +87" and power <5% to re-establish injection. When in an ATWS but not L/P control, operators often use the Lo-Lo level as a limit.
Distracter 3:	Reactor level must be < +87" and power <5% to re-establish injection. Operators are often directed to maintain level at 158" during an ATWS scenario.
K/A System:	295037 SCRAM Condition Present And Power Above APRM Downscale Or Unknown (EOP).
K/A Number:	EK1.02 Knowledge of the operational implications of the following as they apply to SCRAM CONDITION PRESENT AND POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Reactor water level effects on reactor power.
K/A Value:	4.1/4.3
DAEC Objective Number:	95.51.03.05
DAEC Objective Statement:	Differentiate between the entry conditions and strategies employed in power/level control to protect against thermal-hydraulic instability and to protect primary containment

Cognitive Level: 3SPK – The plant Level/Power control. The candidate must determine that the OSS has given an incorrect order for the plant conditions. They must also determine this is incorrect based on RPV level above 87 inches.
Source: Bank 1999 Retake exam, 2001 Practice Audit exam
Operationally Validity: EOP actions and Point of Emphasis in EOP Bases
OE:
Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

13. The plant has suffered a major event and SAG entry was required.
Hydrogen concentrations in the Drywell have reached 5.1%.
You are directed to perform SEP 303.3 "CAD Purge for H2 Control In SAGs"

The following plant conditions currently exist:

- "B" RHR Loop is being used for Drywell and Torus Sprays.
- MO-2010 "RHR Loops A/B Cross-Tie Header Isolation Valve" is CLOSED.
- "A" RHR Loop is in Torus Cooling.
- Drywell Pressure is 25 psig and steady.
- MO-2000 "RHR Loop "A" Inboard Drywell Spray Valve" is bound CLOSED.
- Torus Level is 11.2 ft and stable.

Can N_2 from the CAD system be purged into the containment with the current plant condition?

If YES, where can it be injected?

If NO, why can it not be injected?

a. YES. It can be injected into the "A" RHR Torus Spray Header.
b. YES. It can be injected into the "A" RHR Drywell Spray Header.
c. NO. MO-2000 must be OPENED.
d. NO. Drywell pressure above the High Drywell pressure interlock.

ANSWER:	b
Answer:	With "B" RHR in Drywell and Torus Spray mode the "B" RHR Loop can not be used for CAD injection. The "A" RHR Loop is available for Drywell injection only. The Torus spray header is a single header and common to both "A" and "B" RHR Loops unlike the Drywell Spray headers which are separate (Common misconception). Drywell pressure is below 30 psig, which is the pressure at which CAD will isolate to the Drywell. MO-2000 is upstream of the CAD injection valves (Common misconception).
REFERENCE:	SD 573 Rev 4 pages 42 and 43. SEP 303.3 Rev 4 pages 1-4. P&IDs Bech M119 and 120.
Distracter 1:	CAD can be injected through the Torus Spray Header. However, it can not be injected while the header is being used for spring the Torus. The "B" RHR Loop is using the common header for sprays so this makes this injection path unavailable.
Distracter 2:	CAD does inject at MO-2000. However, it injects down stream and being closed would not effect the injection of CAD.
Distracter 3:	There is a Drywell pressure interlock at 30 psig. However, pressure is below the setpoint and will allow CAD injection.
K/A System:	50000 High Containment Hydrogen Concentration
K/A Number:	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation.
K/A Value:	3.9/4.0

DAEC Objective Number:	42.01.01.06
DAEC Objective Statement:	Describe the Primary Containment and Containment Atmosphere Monitoring and Control System interlocks, including purpose, setpoints, logic, and which valves are affected.
Cognitive Level:	2RI – The candidate must understand the interactions between Drywell pressure, RHR, and CAD based on given plant conditions.
Source:	New
Operationally Validity:	EOP Defeat action and system knowledge requirements for EOP action.
OE:	Design concerns during Noble Metal addition and engineering determination which followed to address the concerns.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

14. Which of the following is designed to initiate AUTOMATIC actions to protect the Main Turbine from over heating of the last stage buckets?

(Assume NO operator actions)

a. High Condenser Backpressure, 7.5" Hg absolute.

b. MSR high level, 3 inches below the MSR Shell.

c. HI-HI exhaust hood temperature, 225°F

d. Main Turbine HI-HI Vibration, 10 mils.

ANSWER:	a
Answer:	This is the main reason and the setpoint given in the SD for the 7.5" Hg Abs. HI Condenser backpressure trip.
REFERENCE:	SD 693.1 Rev 4 page 40. ARP 1C07A A-2 Rev 6 page 3
Distracter 1:	This is a turbine trip signal. However, this is not the purpose of this trip. This will prevent damage to the turbine from water entering the turbine.
Distracter 2:	This is an indication the last stage buckets are over heating and calls for operator actions to trip the turbine manually. However, there are no automatic actions other than an annunciator and the ARP for this alarm require manually tripping the turbine on a confirmed high temp. This is also referenced in the Turbine Trip ARP.
Distracter 3:	Turbine high vibration could occur as a result of last stage over heating and the alarm comes in at 10 mils. However, there is no automatic action that occurs. This was a turbine trip at one time but was removed and the turbine HI-HI vibration ARP requires a manual turbine trip for this alarm. This is also referenced in the Turbine Trip ARP.
K/A System:	295002 Loss of Main Condenser Vacuum
K/A Number:	2.1.27 Knowledge of system purpose and/or function
K/A Value:	2.8/2.9
DAEC Objective Number:	49.01.01.09b
DAEC Objective Statement:	List the setpoints associated with Main Condenser Backpressure and describe the relationship between those setpoints and each of the following components or events: b. Main Turbine Trip
Cognitive Level:	1B – This is the bases behind the Turbine Trip from Main Condenser Backpressure at 7.5" Hg Absolute.
Source:	New
Operationally Validity:	ARP setpoint and system knowledge.
OE:	Turbine trips on loss of vacuum and high vibration has occurred at DAEC.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

15. The plant was at full power when a "Station Blackout" occurred.

Assume the OSS directed you to perform each of the following EOP actions.

Which one of the following actions can be accomplished AND will perform the system function directed by the OSS?
(Assume manual operation of MOTOR OPERATED valves is performed when required)

a. Install Defeat 16 "Containment Atmosphere Monitoring Sample Line Isolation Defeat" to re-establish H_2 sampling of the Drywell.

b. Lower Torus water level by draining the Torus to Radwaste per OI 149 "RHR System" section 12.0 "Draining to Radwaste".

c. Install Defeat 4 "Drywell Cooler Isolation Defeat" to reduce Drywell air temperature.

d. Install AIP 404 "Injection with Fire Water" then initiate Torus and Drywell sprays to reduce Torus and Drywell pressure.

ANSWER:	d
Answer:	Although the RHR pumps and MOVs are AC powered and would be deenergized, Spray the Drywell and Torus can be accomplished by lining up the Diesel Fire pump to the RHR header and manual operation of the MOVs. This would require considerable time but it is achievable.
REFERENCE:	EOP 2 Rev 9. EOP 2 Bases Document Rev 8 pages 44 and 46. AIP 404 Rev 5 pages 1-5. Defeat 16 Rev 2pages 2 and 3. Defeat 4 Rev 6 page 5. OI 149 Rev 78 pages 72 and 73.
Distracter 1:	Defeat 16 is directed in the PC/H leg of EOP 2. However, with the loss of AC power the SVs and sample pumps would not function.
Distracter 2:	The valves used to accomplish this are MOVs. However, draining to Radwaste required RHR in service and with a loss of AC power this is not possible.
Distracter 3:	Defeat 4 is directed in the EOPs for elevated Drywell temperatures that are expected during SBO. However, with loss of AC fans and dampers would not function.
K/A System:	295003 Partial or complete loss of AC Power
K/A Number:	2.4.6 Knowledge of symptom based EOP mitigation strategies
K/A Value:	3.1/4.0
DAEC Objective Number:	2.01.01.06a 34.05.01.02
DAEC Objective Statement:	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): a. Essential 4160/480 VAC electrical power supplies Identify the appropriate procedures that govern the fire protection system operation, include operator responsibilities during all modes of operation, and any actions required by personnel outside of the control room
Cognitive Level:	2RI – The candidate must understand the relationship between the Fire suppression system and RHR to come to this conclusion.
Source:	New

Operationally
Validity:
OE:
Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
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TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

16. A plant transient occurred from full power.
A SCRAM was successfully inserted.
RPV injection is secured with the exception of CRD.
The MSIVs are open.
Reactor Water level is 280 inches on the Floodup Level indicator and slowly rising.
Reactor pressure is 145 psig and slowly raising.

Which of the following is required for the CURRENT plant conditions?

a. Initiate Shutdown Cooling and drain to Radwaste.

b. Manually open SRVs as needed to provide a drain path.

c. Reduce Load Set until the Main Steam Bypass Valves open.

d. Close the MSIVs until RPV level is restored and MSLs drained.

ANSWER:	d
Answer:	ARP 1C05A D-1 requires closure of MSIVs prior to flooding the MSLs. This is at about 258 inches as indicated on the floodup instrumentation.
REFERENCE:	ARP 1C05A D-1 Rev 4
Distracter 1:	This is a plausible choice because this is one method to lower RPV level. However, The SDC interlock will not allow this until RPV pressure is less than 135 psig. Also this would not drain the MSL.
Distracter 2:	This could be possible because the SRVs would drain water to the Torus at this pressure. The SRVs are used for water flow during some EOP conditions. However, this is not a condition that would warrant water flow through the SRVs and the OI P&Ls specifically say not to manually open the SRVs if the potential for two-phase flow exist unless directed by the EOPs.
Distracter 3:	With the MSIVs open the Bypass valves could possibly drain to the condenser. However, using Load Set would not work because the lowest pressure the Bypass Valves will control on Load Set is 150 psig.
K/A System:	295008 High Reactor Water Level:
K/A Number:	AA1.03 Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL: Main steam system
K/A Value:	3.1/3.1
DAEC Objective Number:	48.04.01.01
DAEC Objective Statement:	Evaluate the precautions and limitations, operating cautions, or procedural notes of OI 683 to any component or Main Steam System operating status
Cognitive Level:	1P – The candidate has to recognize the MSLs are flooded and ARP actions are required for high RPV level.
Source:	New
Operationally Validity:	ARP action required by ARP and an industry event at another NMC plant.
OE:	Yes - Monticello

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

17. The plant is at full power.
Drywell temperature is 130°F and rising due to a Well Water problem.
The OSS directs you to, "Vent the Drywell IAW OI 573 "Containment Atmosphere Control System" section 6.1 "Normal Containment Venting".
"B" SBGT is started and Containment Rad levels are normal.
You have lined up and are venting the Drywell and maintaining Drywell pressure as directed.

RIM-7606A "A RB Vent Shaft Rad Monitor " fails downscale.

Which one of the following is correct concerning the venting of the Drywell?

Drywell venting ...

a. is **NOT** effected because RIM-7606A is not associated with "B" SBGT.

b. can **NOT** be re-established with either a Group 3A or B Isolation signal present.

c. can be re-established once RIM-7606A input to Group 3A logic is bypassed and the Containment Vent Path is selected to Drywell on 1C05.

d. can continue but only (the small valve) CV-4310 "Inboard DW Vent CV-4302 Bypass Valve" is available with the Group 3A isolation signal present.

ANSWER:	c
Answer:	The rise in Drywell air temperature will cause Drywell pressure to rise. The ARP for Hi pressure directs investigation as to why pressure is increasing. It also directs venting the Drywell to maintain <1.5 psig. After vent starts the Group 3A isolation occurs. The venting can be re-established as long as no 2 psig Drywell pressure is received.
REFERENCE:	OI 573 Rev 61 pages 17, 18, and 20. SD 573 Rev 4 page 11-13, 60, and 61.ARP 1C05B C-8 Rev 16 pages 1, 5, and 8.
Distracter 1:	It is correct that RIM 7606A effects the "A" SBGT train. However, It will cause Group 3A isolation and even though the "B" SBGT was running the vent path is secured on either an "A" or "B" isolation signal.
Distracter 2:	The venting will stop upon receipt of the Group 3A isolation. However, there are provisions to override most of these signal and in this case it is possible to recover the venting.
Distracter 3:	CV 4302 (Large 18 inch valve)is isolated on a Group 3A and CV-4310 (Small 2 inch valve) also isolates on a Group 3A signal. CV-4303 is down steam of both of these valves and it is isolated on a Group 3B logic. The arrangement of A and B logic is often confused. In any case if either an "A" or "B" isolation occurs venting is stopped. In this case venting though CV-4310 can not continue unless overrides are inserted.
K/A System:	295012 High Drywell Temperature
K/A Number:	2.4.31 Knowledge of annunciators, alarms, and indications, and use of the response instructions.
K/A Value:	3.3/3.4
DAEC Objective Number:	68.01.01.08b

DAEC Objective Statement:	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: b. Primary Containment Isolation System
Cognitive Level:	2RI – The candidate will have to understand the interrelationships between PCIS, SBGT, and Containment venting.
Source:	New
Operationally Validity:	Expected operator knowledge of elevated Drywell temperature and its effect on the plant along with operator actions.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

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TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

18. 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
Answer:	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.
REFERENCE:	UFSAR 6.2.1.3.3.3
Distracter 1:	Temp goes up and continues to go up.
Distracter 2:	Temp goes up and continues to go up.
Distracter 3:	Temp goes up and continues to go up.
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 Number:	2.01.01.08
DAEC Objective Statement:	State the purpose of the RHR system
Cognitive Level:	1-B
Source:	Bank 2001 NRC Exam
Operationally Validity:	dominate operator action on PRA
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

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TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

19. AOP 915 "Shutdown Outside Control Room" has been entered and the transfer has been completed.

Which of the following is correct?

a. Div I RHR and Core Spray logics are disabled. LLS and ADS are disabled.

b. Div I RHR and Core Spray logics are disabled. ADS and Group 1 are disabled.

c. Div II RHR and Core Spray logics are disabled. LLS and ADS are disabled.

d. Div II RHR and Core Spray logics are disabled. LLS and Group 1 are disabled.

ANSWER:	c
Answer:	Note in AOP 915 explains the functions which are disabled
REFERENCE:	AOP 915 TAB 1Rev 22
Distracter 1:	LLS and ADS Are disabled. However Div II RHR and CS are disabled not Div I
Distracter 2:	ADS is disabled. However, we expect a Group 1 and purposely leave the Mode Switch in Run to ensure it occurs. Div II RHR and CS are disabled not Div I
Distracter 3:	LLS and Div II RHR and CS are disabled. However we expect a Group 1 and purposely leave the Mode Switch in Run to ensure it occurs.
K/A System:	295016 Control Room Abandonment
K/A Number:	AK2.02 Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: Local Control Stations
K/A Value:	4.0/4.1
DAEC Objective Number:	94.28.06.02
DAEC Objective Statement:	State the effect of manipulating each of the emergency transfer switches, for the Remote Shutdown Panel system, including the bases for operating the YELLOW transfer switches last
Cognitive Level:	2RI
Source:	New
Operationally Validity:	AOP action which removes control from the control room
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

20. **Review the indication given in the Support Material Booklet**
The plant was at power.
A transient has occurred requiring entry into EOP 4.
An Off-site release is in progress.

Review the attached panel indications.

Which one of the following systems has failed to isolate and what is the source of the steam leak? (Assume in each case the indicated system is the only failure and all other systems have responded correctly)

a. HPCI steam leak in Radwaste.

b. RWCU steam leak in Steam Tunnel.

c. MSL drain steam leak in Turbine Building.

d. RCIC steam leak at Barometric Condenser.

ANSWER:	c
Answer:	MSL drains have failed to isolate and are leaking in the Turbine Building. A Group 1 has isolated the MSL.
REFERENCE:	SD 683 Rev 3 page 63. BECH-M114 Rev 64.
Distracter 1:	HPCI is in a normal Standby line up. CV2234 to RW is normally open. This is actually from the HPCI Turbine condensate pump and would be low energy water a break down stream would still be inside the Reactor Building.
Distracter 2:	RWCU has isolated. However, RWCU is indicating an outboard isolation. The leak in this case would be in the Drywell or RB 2nd floor not the Steam Tunnel. Also a Steam tunnel leak would have isolated HPCI, RCIC and MSL drains.
Distracter 3:	RCIC is showing normal running indications. A leak at the Barometric Condenser is possible with these indications be it would not lead to a leak outside secondary containment unless there is a failure in Secondary Containment. All others systems were assumed to have functioned so a leak would not be possible.
K/A System:	295017 High Off-Site Release Rate
K/A Number:	AA2.04 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Source of off-site release.
K/A Value:	3.6/4.3
DAEC Objective Number:	95.71.06.06
DAEC Objective Statement:	Use control room indications and plant personnel to determine the source and location of a primary system discharge outside of containment
Cognitive Level:	2RI – The Candidate must recognize the relationship between PCIS and various other Systems and what the expected response would be to a leak.
Source:	New
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

21. The plant is at Full power.
A partial loss of GSW occurs.

Which of the following components has exceeded an AUTOMATIC trip point and is required to be tripped manually?

a. "A" RFP with oil temperature at 245°F.

b. The Main Generator with Isolation Bus Temperature at 185°F.

c. The "A" Recirc MG Set with oil temperature at 220°F.

d. Both "A" and "B" EHC pumps with EHC Tank temperature at 140°F.

ANSWER:	c
Answer:	The Recirc MG set should have received a Trip signal A 210°F and operator action is require if a trip did not occur but should have to prevent equipment damage. The reason the operator has to secure the "A" MG is because the oil temperature has exceeded the trip set point and operation standards require the operator to take the action if an automatic action has failed.
REFERENCE:	AOP 411 Rev 14, ARP 1C04A A-4 Rev 14
Distracter 1:	The LO temp will rise on loss of GSW. However operator actions are required because there is no Automatic trip associated with RFP lube oil temp high.
Distracter 2:	Loss of GSW will cause ISO Bus duct temperatures to rise. However there is no Automatic feature to trip the Main Generator. Operator action is required.
Distracter 3:	Loss of GSW will cause EHC tank temperatures to rise. However there is no pump trip associated with high oil temp. Operator action is required.
K/A System:	295018 Partial or Complete Loss of Component Cooling Water
K/A Number:	AK3.03 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Securing individual components (prevent equipment damage)
K/A Value:	3.1/3.3
DAEC Objective Number:	28.01.01.06c/d/e/h 94.16.01.04 /4
DAEC Objective Statement:	Given a General Service Water System operating mode and various plant conditions, predict how each supported system will be impacted by failures in the General Service Water System: c. Recirc MG System d. Condensate and Feedwater System e. Main Generator System h. EHC System State when AOP-411, GSW Abnormal, directs the following: 4. One or Both Recirc MG Sets Tripped
Cognitive Level:	2RI
Source:	New
Operationally Validity:	AOP and ARP action
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

22. A complete loss of the service and instrument air systems occurs while at full power. Operators are trying to restart a compressor as air header pressure lowers, but they may be required to SCRAM the reactor.

    Which one of the following is a potential effect on the Control Rod Drive (CRD) Hydraulic System?

    a. The scram discharge volume may fail to isolate when the scram occurs.

    b. Cooling flow could be lost to the control rod drive mechanisms before the scram occurs.

    c. The running CRD pump could trip due to operating at no flow conditions.

    d. The Backup scram valves could fail to vent the Scram Air Header when the scram occurs.

ANSWER:	b
Answer:	The Flow control valves fail closed on a loss of air. This will cause a loss of cooling flow and drive water flow. This ensures all CRD flow will be directed to the HCUs through the charging water header for insert flow through the SCRAM Valves.
REFERENCE:	AOP 518, revision 19
Distracter 1:	SDV vents and drains fail CLOSED, not OPEN.
Distracter 2:	Flow control valve fail closed, but water is still supplied to the charging water header CVs and the minimum flow line.
Distracter 3:	Backup scram valves are solenoid valves.
K/A System:	295019 Partial or Complete Loss of Instrument Air
K/A Number:	AA2.02 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 system loads
K/A Value:	3.6/3.7
DAEC Objective Number:	10.01.01.05.f
DAEC Objective Statement:	Given a Control Rod Drive Mechanisms and Hydraulic System operating mode and various plant conditions, predict how the Control Rod Drive Mechanisms and Hydraulic System will be impacted by the following support system failures: f. Instrument and Service Air
Cognitive Level:	2RI
Source:	Bank 1999 NRC Exam, 2001 ILC Audit Exam
Operationally Validity:	AOP. ARP, and system knowledge.
OE:	DAEC has experienced several Instrument Air System failures in the past.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

23. **Review the indication given in the Support Material Booklet**

The plant is currently at 90% power.
I&C Technicians are performing a TIF on a problem in 1C43 "Division 1 Core Spray Vertical Board".
A CIMS alarm is received.

Which of the following is correct concerning the indications provided?

a. The "B" Drywell Well Water isolation valves have isolated. The "A" Drywell Well Water isolation valves have **not** isolated. If no operator actions are taken the Reactor **will** scram.

b. Both "A" and "B" Drywell Well Water isolation valves have isolated. If no operator actions are taken the Reactor **will** scram.

c. A signal is present for the Well Water Isolation but **not** all valves have isolated. If no operator actions are taken the reactor **may** scram depending on the current valve positions.

d. A signal is present for the Well Water Isolation but the signal has an override in effect. A Reactor scram will **not** occur.

ANSWER:	b **(NOTE: <u>Attach a picture of the PCIS Status showing a Group 7 isolation with no override in effect and no other isolations)</u>**
Answer:	The indications are for an inadvertent Group 7 isolation. All valves are indicating closed and an isolation signal is present. The candidate must understand a reactor SCRAM will occur under these conditions on Drywell pressure of 2 psig unless operator action is taken.
REFERENCE:	BECH E111 sheet 16 Rev9, BECH E113 sheet 94 Rev 16, SD 959.1 Rev 3
Distracter 1:	Group 7 has only a "B" side logic. The Rx will scram on 2 psig Drywell if no actions are taken. However, all valves "A" and "B" are closed on the isolation signal.
Distracter 2:	The green light signifies all valves have positioned properly
Distracter 3:	The amber light indicates an isolation signal is present there is another amber light to the left which indicates an override is in effect.
K/A System:	295020 Inadvertent Containment Isolation
K/A Number:	AA1.02 Ability to operate and/or monitor the following as they apply to INADVERTENT CONTAINMENT ISOLATION: Drywell ventilation/cooling system
K/A Value:	3.2/3.2
DAEC Objective Number:	68.01.01.08a/b
DAEC Objective Statement:	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: a. Well Water System b. Primary Containment Isolation System
Cognitive Level:	3SPR
Source:	New
Operationally Validity:	Control Board indications, system response and plant effects
OE:	Plant transients have occurred during I&C troubleshooting at DAEC and other stations.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

24. Given the following Conditions:

The plant is operating at full power.
The "A" CRD pump Tripped.
The "B" CRD pump has NOT been started.

Which one of the following statements describes the effect the loss of CRD pumps has on the plant?

a. The Control Rods will NOT fully SCRAM with RPV pressure alone due to pressure equalization across the drive piston.

b. The Control Rods can still be SCRAMMED, but the insertion time will be significantly longer.

c. Multiple Control Rods will begin to drift if a pump is NOT returned to service within 15 minutes.

d. Control Rod Drive mechanism temperatures will begin to rise.

ANSWER:	d
Answer:	If the CRD pump remains off an extended time the CRD high temperature annunciator will eventually come in as CRD temperatures rise. With a loss of cooling water flow at power CRD high temperature alarms are expected
REFERENCE:	ARP 1C05A E-6 Rev 3. SD 255 Rev 7 Pages 44-48.
Distracter 1:	There would actually be a large DP across the drive piston that would drive the rod in at normal SCRAM speed. The Rods would fully insert.
Distracter 2:	At power rod insertion time would not be longer due to high RPV pressure. At low RPV pressure this could be a concern if accumulator pressure was allowed to lower.
Distracter 3:	A CRD Accumulator pressure will start to lower. However There is no reason for a Rod drifts to occur.
K/A System:	295022 Loss of CRD Pumps
K/A Number:	AA2.03 Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS: CRD Mechanism Temperatures
K/A Value:	3.1/3.2
DAEC Objective Number:	10.01.01.04
DAEC Objective Statement:	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 that may be necessary to place the Control Rod Drive Mechanisms and Hydraulic System in the correct lineup.
Cognitive Level:	3PEO
Source:	Bank – 2000 Clinton unit 1 NRC Exam slightly modified for DAEC.
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

25. **Review the indication given in the Support Material Booklet**

The plant is currently at 45% power.
An SRV is leaking by to the Torus.

Which of the following is correct concerning the Torus Temperature indicator on 1C03?
(Assume the ONLY parameter changing is Torus Temperature)

a. The indicator is receiving a SINGLE input signal. Before the RED band is reached an **EOP 1** entry is required.

b. The indicator is receiving a SINGLE input signal. Before the YELLOW band is reached an **EOP 1** entry is required.

c. The indicator is receiving MULTIPLE input signals. Before the RED band is reached an **EOP 1** entry is required.

d. The indicator is receiving MULTIPLE input signals. Before the YELLOW band is reached an **EOP 1** entry is required.

ANSWER:	c **(Attach a picture of 1C03 of the Torus water temp indicator.)**
Answer:	This indicator has multiple inputs and if inputs are lost the amber light next to the indicator would be on indicating the inputs are not averaged. The red band starts at 110°F and EOP 2 requires entry into EOP 1 prior to 110°F
REFERENCE:	EOP 2 Rev 9 step T/T-4
Distracter 1:	The red band does require EOP 1 entry but the indicator is receiving multiple input based on the amber light being out.
Distracter 2:	The yellow band requires EOP 2 entry on Torus Temperature of 95°F and the indicator is receiving multiple inputs based on the amber light being out.
Distracter 3:	The indicator is receiving multiple inputs but the yellow band requires EOP 2 entry on Torus Temperature of 95°F.
K/A System:	295026 High Suppression Pool Water Temperature
K/A Number:	EA1.03 Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL WATER TEMPERATURE: Temperature monitoring.
K/A Value:	3.9/3.9
DAEC Objective Number:	95.00.00.17
DAEC Objective Statement:	Evaluate plant status and control room indications to determine the applicability and affect of any EOP Curve or Limit
Cognitive Level:	2RI
Source:	New
Operationally Validity:	EOP break point for SCRAM required
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

26. A loss of Drywell cooling occurred, causing the crew to SCRAM (successfully) from Full power.

When Average Drywell Air temperature could **NOT** be restored and maintained <280°F the crew Emergency Depressurized the RPV.
The OSS has performed a crew brief to inform the crew that the "Sat Curve" has been entered. (EOP-2, Graph 1)

The following applicable parameters are at these stable values:

- Both Recirc pumps are tripped.
- Indicated NR GEMAC RPV level 190″
- Indicated WR Yarway RPV level 200″
- Indicated WR GEMAC (Floodup) RPV level 200″
- Indicated Fuel Zone RPV level 190″

Which value for RPV water level, if any, should be used for EOP decision-making purposes?

a. 167″

b. 190″

c. 200″

d. None, all RPV level indicators should be considered unreliable.

ANSWER:	a
Answer:	This strategy has changed drastically since over the past several years. See training material for full explanation.
REFERENCE:	EOP-2; EOP-2 Bases Rev 8 page 38.
Distracter 1:	Indicators can be used but only with a -23″ penalty.
Distracter 2:	WR Yarway cannot be used after ED; WR GEMAC cannot be used until TSC evaluates.
Distracter 3:	Possible misconception; this was the correct answer for years until EOP-2 was revised and system modifications were performed. Level indication reliability should be questioned, but indications are stable, thus OK.
K/A System:	295028 High Drywell Temperature
K/A Number:	EK1.01 Knowledge of the operational implications of the following as they apply to HIGH DRYWELL TEMPERATURE: Reactor water level measurement
K/A Value:	3.5/3.7
DAEC Objective Number:	95.59.03.01
DAEC Objective Statement:	For any given entry condition, step, Caution, or Continuous Recheck Statement in EOP 2, explain the bases for the statement
Cognitive Level:	2RI
Source:	BANK 1999 Retake Exam, 2001 Practice Audit Exam
Operationally Validity:	EOP caution and adequate core cooling concern if the wrong level instruments are used for level control.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

27. **Review the indication given in the Support Material Booklet**

EOP 2 directs entry into **EOP 1** if Torus Water Level CANNOT be maintained BELOW 13.5 ft.

Review the attached picture.
At what point does Torus water level reach the level that requires **EOP 1** entry from **EOP 2**?

a. A

b. B

c. C

d. D

ANSWER: b

(Attach a picture of the Torus to DW vacuum breakers with point A-D to choose from)

Answer: EOP 2 directs EOP 1 entry when level cannot be maintained below 13.5 ft which corresponds to the Bottom of the Torus-DW Vacuum Breakers. The candidate will have to understand the reason a SCRAM is required is that at this water level containment integrity could be challenged and that while there is no SCRAM signal on Torus level entering EOP 1 requires the Reactor to be shutdown.

REFERENCE: EOP 2 Rev 9, EOP Bases Document EOP Breakpoints Rev 4 page 8

Distracter 1: Bottom of ring header is another setpoint for ED. However, the point shown is not the bottom elevation of the ring header. 13.8 ft is the level of the ring header the point shown is a transition piece from the DW downcomer to the ring header. There is no EOP level associated with this point

Distracter 2: This is when the Vacuum breakers would be covered with water and Containment integrity could be challenged. There is no EOP level associated with this point

Distracter 3: This is when the Vacuum breakers would be covered with water and Containment integrity could be challenged. There is no EOP level associated with this point

K/A System: 295029 High Suppression Pool Water Level

K/A Number: EK3.03 Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Reactor SCRAM

K/A Value: 3.4/3.5

DAEC Objective Number: 93.00.00.16

DAEC Objective Statement: Evaluate plant status and control room indications and determine when a manual scram shall be initiated.

Cognitive Level: 2DR

Source: New

Operationally Validity: EOP Break point containment failure will Torus level above this point is possible under some accident conditions.

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

28. Which of the following curves, if followed, will prevent system damage due to air entrainment?

    a. ECCS Vortex Limit

    b. RHR NPSH Limit

    c. Heat Capacity Limit

    d. Core Spray NPSH Limit

ANSWER:	a
Answer:	Only the Vortex limit is concerned with air entrainment.
REFERENCE:	EOP Bases EOP curves and limits Rev 5 page 67
Distracter 1:	Viable suppression pool limit. However does not protect against air entrainment.
Distracter 2:	Viable suppression pool limit. However does not protect against air entrainment.
Distracter 3:	Viable suppression pool limit. However does not protect against air entrainment.
K/A System:	295030 Low Suppression Pool Water Level
K/A Number:	EK1.02 Knowledge of the operational implications of the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Pump NPSH
K/A Value:	3.5/3.8
DAEC Objective Number:	95.00.00.18
DAEC Objective Statement:	Evaluate the possible consequences of exceeding any EOP Curve or Limit on the mitigation of an event
Cognitive Level:	1B
Source:	Bank: Quad Cities 2000 NRC exam (restructured)
Operationally Validity:	EOP curve and equipment failure prevention.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

29. The plant is at full power.
During transfer of RWCU resin, a pipe break released resin to the RB 2nd Floor North area outside the RWCU Phase Separator Room.
EOP 3 was entered on Radiation Levels in ONE area above MAX SAFE.
No other EOP 3 entry conditions exist.
The resin has been contained in this area.

The following High Radiation Areas have been posted due to this event:

- RB 1st Floor Northwest
- RB 2nd Floor North and SBGT Room
- RB 3rd Floor Northwest
- RB North Stairwell below RB 4th Floor
- ALL other area radiation levels are normal

Which alarm is consistent with this event?

a. 1C03A D-9 "RBCCW RM-4820 HI RAD"

b. 1C04C A-1 "RADWASTE EFFLUENT RIS-3972 HI RAD"

c. 1C04B B-6 "NEW FUEL STORAGE AREA ARM HI RAD"

d. 1C04B D-7 "RHRSW AND ESW EFFLUENT RM-1997 OR RM-4268 HI RAD"

ANSWER:	a
Answer:	The RBCCW process rad monitor is located in the overhead area where this resin spill would be. The alarm would be expected with elevated rad levels.
REFERENCE:	SD 414 Rev 4 page 10, ARP 1C03A D-9 Rev 6
Distracter 1:	The Radwaste building is located next to the RB West wall, which is near this area. However the Radwaste Effluent Process Rad Monitor is not near this area.
Distracter 2:	This ARM is located in the RB. However, the detector is located on the refuel floor and would not be alarming under the given conditions.
Distracter 3:	ESW piping is located near this area. However the process rad monitor is located outside the TB and would not be effected by this event.
K/A System:	295033 High Secondary Containment Radiation Levels
K/A Number:	EK2.02 Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT RADIATION LEVELS and the following: Process radiation monitoring system.
K/A Value:	3.8/4.1
DAEC Objective Number:	85.00.00.05
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the PRM system is operating as expected and identify any actions that may be necessary to place the PRM system or the plant in the correct condition
Cognitive Level:	1S
Source:	New
Operationally Validity:	EOP indications. The candidate should be able to distinguish normal alarms based on rad monitoring indications and given rad conditions in the plant.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

30. Which of the following requires operator verification of Secondary Containment Isolation **and** entry into EOP 3?

    a. RB Vent Shaft Rad Monitor Rad levels reading 10 mR/hr.

    b. Offgas Vent Pipe above the HI-HI Rad Trip setpoint.

    c. Fuel Pool Exhaust Rad levels reading 10 mR/hr.

    d. MSL HI-HI Rad at 500 mR/hr.

ANSWER:	c
Answer:	EOP 3 entry is required if the Fuel Pool Exhaust Rad levels reach 9 mR/hr and this also corresponds to a Group 3 isolation and SBGT start.
REFERENCE:	EOP 3 Rev 15, ARP 1C05B C-8 Rev 16
Distracter 1:	RB Vent Shaft Rad Monitor Rad levels at 11 mR/hr will cause the conditions stated. However the reading given is below that setpoint. Neither action would occur.
Distracter 2:	Offgas Vent Pipe above the HI-HI Rad Trip setpoint causes a Group 3 isolation and SBGT start. However this is not an EOP 3 entry. Note this was an EOP 3 entry at one time.
Distracter 3:	MSL HI-HI Rad will cause a Group 1 isolation and may lead to an EOP 3 entry. However this will not generate a Group 3 and is not an EOP 3 entry condition.
K/A System:	295034 Secondary Containment Ventilation High Radiation.
K/A Number:	EA1.03 Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: Secondary Containment Ventilation
K/A Value:	4.0/3.9
DAEC Objective Number:	95.00.00.22 7.02.01.02
DAEC Objective Statement:	For any given EOP, state the entry condition for the EOP List the signals which cause a SBGT System auto initiation including setpoints and logic. Describe how they are bypassed and how they are reset.
Cognitive Level:	1I
Source:	New
Operationally Validity:	EOP entry and knowledge of proper system response during a plant transient.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

31. EOP 4 " Radioactive Release Control" requires Emergency Depressurization before certain conditions are reached.

What purpose does Emergency Depressurization achieve AS IT RELATES TO EOP 4?

a. This establishes or maintains adequate core cooling.

b. This places the primary system in a low energy condition and reduces the driving head to the leak.

c. Reduces the energy in the RPV before reaching conditions where the primary containment will not accommodate an SRV opening.

d. This places the RPV in a low energy condition before reaching conditions where a loss of coolant accident could not be adequately contained in the primary containment.

ANSWER:	b
Answer:	The purpose of ED during EOP 4 is to remove the driving head to the leak outside secondary containment and place the RPV in a low energy condition.
REFERENCE:	EOP Bases EOP 4 Rev 4 page 9, EOP Bases ED Rev 6 page 1
Distracter 1:	This is a purpose for ED. However, this is not the purpose associated with EOP 4
Distracter 2:	This is a purpose for ED. However, this is not the purpose associated with EOP 4
Distracter 3:	This is a purpose for ED. However, this is not the purpose associated with EOP 4
K/A System:	295038 High Off-Site Release Rate
K/A Number:	EK3.04 Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Emergency Depressurization.
K/A Value:	3.6/3.9
DAEC Objective Number:	95.71.01.04
DAEC Objective Statement:	Explain how the mitigation strategies used in EOP 4 accomplish the purpose of EOP 4
Cognitive Level:	1B
Source:	New
Operationally Validity:	EOP bases
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

32. A fire occurs in the Cable Spreading Room.
(Assume the Fire Protection System is lined up for AUTOMATIC ACTUATION and Cable Spreading Room access is restricted)

The installed fire protection system automatically actuates.
The room must be entered to determine if the fire has been extinguished.

(1) What is the classification of the fire that is expected in this area?

AND

(2) What safety hazard, from the automatic system actuation, should be considered prior to operators entering the Cable Spreading Room?

	(1)	(2)
a.	Class B	Electrical Shock from water spray
b.	Class C	Electrical Shock from water spray
c.	Class B	Suffocation from oxygen depletion due to the discharge of CO_2 in the area
d.	Class C	Suffocation from oxygen depletion due to the discharge of CO_2 in the area

ANSWER:	d
Answer:	This is a Class C electrical fire and the installed fire suppression system is CARDOX.
REFERENCE:	OI 513 Rev 59 pages 4 and 6. Safety Rule book.
Distracter 1:	Class B is an Oil type fire and not an expected type fire in the cable spreading room and there is no installed water systems in the Cable Spreading Room
Distracter 2:	There is no installed water systems in the Cable Spreading Room
Distracter 3:	Class B is an Oil type fire and not an expected type fire in the cable spreading room.
K/A System:	600000 Plant Fire On Site
K/A Number:	AK1.01Knowledge of the operation applications of the following concepts as they apply to PLANT FIRE ON SITE: Fire Classifications by type.
K/A Value:	2.5/2.8
DAEC Objective Number:	34.05.01.01
	Fire Brigade Training
DAEC Objective Statement:	Relate the precautions and limitations, operating cautions, or procedural notes of OI-513 to any component or fire protection system operating status
	Fire Classification
Cognitive Level:	II
Source:	Bank from Dresden 2000 NRC Exam (modified)
Operationally Validity:	Personnel safety and plant fire system knowledge. Also all operators are trained as part of the fire brigade.
OE:	The CARDOX system has inadvertently actuated at DAEC and there are industry events for CO_2 hazards.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

33. **Review the indication given in the Support Material Booklet**
RO ONLY
The plant is shutdown.
The "B" side of Shutdown Cooling is in service with "B" RHR and "B" RHRSW pumps running.

Annunciator 1C03B B-4 "RHR SHUTDOWN COOLING SUCTION HEADER HI PRESSURE" alarms.
Annunciator 1C05B D-8 "PCIS GROUP "4" ISOLATION INITIATED" alarms 30 seconds later.

The Group 4 PCIS indications are shown on the next page.
No other PCIS indications have changed.

Which of the following would be consistent with the indicated plant conditions

AND

what is/are the required operator action(s) for these conditions?

a. "B" RHR pump has tripped.
Manually CLOSE/VERIFY CLOSED MO-2010 "RHR Crosstie Valve" and START an "A" side RHR and RHRSW pump to establish Shutdown Cooling on the "A" side.

b. Reactor Pressure of 145 psig and rising.
Manually CLOSE/VERIFY CLOSED MO-1908 "Inboard Shutdown Cooling Isolation Valve" and MO-2003 "A Inboard Inject Isolation Valve".

c. "B" RHR pump has tripped.
REOPEN MO-1909 "Shutdown Cooling Isolation Valves" and START the "D" RHR pump.

d. Reactor Pressure of 145 psig and rising.
THROTTLE OPEN MO-1939 "B Heat Exchanger Inlet Throttle Valve" to increase cooling flow.

ANSWER: b

Answer: The indications given are for a valid Group 4 signal on 135 psig in the RPV. The "A" side of the Group 4 failed to isolate. 1C05B D-8 and operations standards direct operators to take automatic action, which should have occurred, but failed. System Descriptions for RHR and PCIS discuss logic and interlocks for RHR and PCIS.

REFERENCE: 1C05B D-8 Rev 9 page 1-3. 1C03B B-4 Rev 5 page 1.

Distracter 1: The "B" RHR pump has tripped and MO-2010 is closed. However, the Group 4 isolation will not allow placing the "A" side in SDC until RPV pressure is reduced to <135 psig. MO-2010 needs to be open to place "A" side in SDC.

Distracter 2: The "B" RHR pump has tripped. However, the Group 4 isolation will not allow placing SDC in service until RPV pressure is reduced to <135 psig. Completion of the Group 4 isolation is required by the ARP and operations standards.

Distracter 3: RPV pressure is >135 psig and would cause these conditions and the ARP 1C03B B-4 directs increasing cooling flow to lower RPV pressure. However, The outboard Group 4 isolation would have tripped the "B" RHR pump and closed MO-1905 "Inject Isolation Valve". Any attempt to increase cooling flow will have no effect.

K/A System: 295021 Loss of Shutdown Cooling

K/A Number:	2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.
K/A Value:	3.3/3.3
DAEC Objective Number:	2.01.01.06c 2.07.01.16
DAEC Objective Statement:	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): c. Primary Containment Isolation System (PCIS) Describe how the RHR system responds to an isolation signal when in various modes and any actions that must be taken to verify proper response.
Cognitive Level:	2RI
Source:	New
Operationally Validity:	Recognition of loss of SDC and failure of PCIS with required operator actions.
OE:	DAEC has experienced failure of PCIS which required operator actions. We have also lost SDC.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

34. Refueling operations are in progress with the Mode Switch in "REFUEL".
Which of the following allows the withdrawal of a control rod AND ensures the reactor will remain shutdown?

a. The One-Rod permissive interlock and adequate shutdown margin designed into the core.

b. The RSCS Group Selector switch selected to the correct sequence and adequate shutdown margin designed into the core.

c. Refueling Rod Block Interlocks and the proper rod withdrawal sequence loaded into the RWM.

d. The RSCS Mode Selector Switch placed in "WITHDRAW" and the proper rod withdrawal sequence loaded into the RWM.

ANSWER:	a
Answer:	The One-Rod Permissive along with adequate SDM designed into the core ensures the reactor will remain shut down with any rod withdrawn from the core during refueling operations and refueling accident conditions. Operationally the One-Rod Permissive is designed to prevent inadvertent criticality during refueling operations. However, this feature depends on the appropriate SDM designed into the core.
REFERENCE:	UFSAR/DAEC-1 Rev 14 page 15.4-3. SD 856.1 Rev 4 pages 28and 29.
Distracter 1:	Adequate shutdown margin is correct and the RSCS Group select switch is used during rod withdrawals. However, RSCS provides back lighting only.
Distracter 2:	Refuel Floor interlocks are part of the One-Rod permissive logic. However, the RWM proper rod sequence is used during power operations.
Distracter 3:	This sounds appropriate but the RSCS switch does not provide for this function.
K/A System:	295023 Refuel Accidents
K/A Number:	AK1.02 Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS: Shutdown margin.
K/A Value:	3.2/3.6
DAEC Objective Number:	72.02.01.05 72.03.01.08
DAEC Objective Statement:	Describe the Reactor Manual Control System interlocks, including purpose and setpoints Evaluate reactor status and control room indications to determine which of the different methods of control rod movement is allowed, including an explanation of the criteria used in the evaluation
Cognitive Level:	2RI
Source:	New
Operationally Validity:	The one-rod permissive is an important feature to prevent inadvertent criticality during shut down conditions and is based on having adequate SDM designed into the core.
OE:	Error in SDM have occurred in the industry.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

35. **Review the indication given in the Support Material Booklet**
The plant is at full power.
Annunciator 1C04B B-4 "Steam Leak Detection Ambient HI Temp" was received.
RCIC has failed to isolate and temperatures were noted to be rising slowly.
The operator manipulates the Steam Leak Detection panel as Shown.

Which of the following is correct concerning the RCIC Room?

a. Room Differential Temperature is 50°F.

b. Room Differential Temperature is >50°F.

c. Room Ambient Temperature is 155°F.

d. Room Ambient Temperature is >175°F.

ANSWER:	d
Answer:	RCIC room ambient is in alarm, which occurs at 175°F as indicated by TS-2450B light. With RCIC failure to isolate and temperatures increasing the room temperature must be somewhere above 175°F.
REFERENCE:	SD 858 Rev 3 pages 14 and 15.
Distracter 1:	The operator has taken the switch to set, which displays the setpoint. If the student mistakes the reading for 50°F (upper scale) then they would incorrectly read this as 50°F. This is a possible error that has been made with this type indicator and can lead to misinformation being communicated to the OSS.
Distracter 2:	The operator has taken the switch to set, which displays the setpoint. If the student mistakes the reading for 155°F (lower scale) then they would incorrectly read this as 155°F. This is a possible error that has been made with this type indicator and can lead to misinformation being communicated to the OSS.
Distracter 3:	The indication on TDS-2445B is for its "setpoint" of 50°F Delta T on the upper scale. The operator has taken the switch to set, which displays the alarm setpoint. Someone not familiar with this type instrument may assume the set position would set the meter for the current room temperature reading, in this case 155°F. However, the room temperature is > 175°F.
K/A System:	295032 High Secondary Containment Area Temperatures
K/A Number:	EA2.01 Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURES: Area Temperature
K/A Value:	3.8/3.8
DAEC Objective Number:	75.00.00.02 75.01.01.04
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the Steam Leak Detection System is operating as expected, and identify any actions that may be necessary to place the Steam Leak Detection System in the correct lineup Describe the operation of the following Steam Leak Detection System components: a. Temperature Selector Switches (TSS) b. Differential Temperature Selector Switches (TDSS)
Cognitive Level:	2DR
Source:	New

Operationally Validity:

OE: Error in reading Steam Leak Detection has occurred in the simulator and caused crews to take incorrect actions based on the indication communicated by the operator at the Steam Leak Detection Panel. In this case if the operator had read the RCIC room temperature the same way he would have reported RCIC room temperature at 175°F and steady. In reality room temperature could be in excess of 300°F MAX Safe and would require EOP 1 and SCRAM.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

36. Main Plant Exhaust Plenum pressure is rising.

Which of the following will AUTOMATICALLY initiate to provide the indicated protective function?

a. The Main Plant Exhaust Fans sequentially SHIFT to High Speed to prevent collapsing the Main Plant Exhaust Plenum.

b. The Reactor Building Exhaust Fans START to prevent Refuel Floor blow out panels from lifting.

c. The Reactor Building Supply fans TRIP to prevent over pressurizing Secondary Containment.

d. SBGT STARTS to draw at least a -.25 inch WG in the Reactor building.

ANSWER:	c
Answer:	As Secondary Containment pressure increases the Main plant supply fans will start to shutdown at their start permissive setpoint. At -0.20 Inches WG all the RB supply fans will be off. This prevents overpressurization of Secondary Containment.
REFERENCE:	1C23C A-6 Rev 6 pages 1 and 2
Distracter 1:	The Main plant exhaust fan starting is directed if needed. However, this is a manual operation and they do not have a fast speed position. There are fans in plant (Turbine Building Exhaust) that do have similar functions). DAEC has had damage to the Main Plant Exhaust Plenum in the past.
Distracter 2:	Starting the Reactor Building exhaust fans would lower Secondary Containment pressure. However, these fans are manually started and their inlet dampers modulate to control the pressure in the Exhaust Plenum. The blow out panel will lift if RB pressure gets to high.
Distracter 3:	SBGT is designed to maintain the RB negative at -.25 WG with an isolation. However, there is no automatic start of SBGT on RB pressure although the OSS could direct this action if warranted but it would have to be done manually.
K/A System:	295035 Secondary Containment High Differential Pressure
K/A Number:	EK3.02 Knowledge of the reasons for the following responses as they apply to the SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary containment ventilation response.
K/A Value:	3.3/3.5
DAEC Objective Number:	67.01.01.09
DAEC Objective Statement:	Describe the Reactor Building fan control system including interlocks, starting permissive, auto operation, and trips on RB Supply and Exhaust fans, and Refuel Floor fan
Cognitive Level:	2RI
Source:	New
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

37. From which of the following source(s) can power for SV-1856 "RPS "A" Scram Pilot Solenoid Valves" originate?

    a. Bus 1B32 only

    b. Bus 1D13 only

    c. Buses 1B32 or 1B42

    d. Buses 1D13 or 1D23

ANSWER:	c
Answer:	The Scram valve solenoids are powered from 1B32 normal power supply or 1B42 via the alternate EPA Breakers.
REFERENCE:	SD 255 Rev 25 page
Distracter 1:	1B32 is correct. However, it is not the only power supply.
Distracter 2:	1D13 supplies power to the Backup Scram Solenoid Valves"
Distracter 3:	1D13 and 1D23 supplies power to the Backup Scram Solenoid Valves"
K/A System:	201001 CRD Hydraulic
K/A Number:	K2.02 Knowledge of electrical power supplies to the following: Scram valve solenoids.
K/A Value:	3.6/3.7
DAEC Objective Number:	22.00.00.07
DAEC Objective Statement:	Describe the operation of the following principle Reactor Protection System components: e. Scram Pilot Valves
Cognitive Level:	1F
Source:	New
Operationally Validity:	Safety feature power supply and system knowledge requirements.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

38. **RO ONLY**

The 1C05 operator is on step 20 of the "Control Rod Withdrawal Sequence Sheet".
Control Rod 22-39 has just been withdrawn to position 12.
Control Rod 38-23 is selected.
Backlights on Rods 22-39 and 38-23 are bright.
RWM reads "RPIS INDICATES THAT RODS 22-39 AND 38-23 ARE SELECTED"
RWM is in "OPERATE".

Which of the following is the combined effect from the RWM and RBM as it pertains to Inward and Outward rod motion?

a. Bypassing the RWM allows Outward rod motion. Inward rod motion is NOT effected.

b. NO Outward rod motion is allowed. Inward rod motion is NOT effected.

c. NO Outward rod motion is allowed. Inward rod motion is allowed with "Emergency In" or SCRAM signal only.

d. NO Outward rod motion is allowed. Inward rod motion can NOT occur unless the RWM is bypassed or by SCRAM signal.

ANSWER:	d
Answer:	With more than one rod selected a Rod Block and RWM Rod Block are generated. This prevents any rod motion except for a Manual SCRAM or by taking RWM to BYPASS .preventing it from enforcing the insert block.
REFERENCE:	SD 856.1 Rev 4 pages 12,16,18,and 21. SD 878.8 Rev 5 page 39. SD 878.5 Rev 5 pages 28 and 33.
Distracter 1:	Inward rod motion is normally allowed even under faulted conditions. Bypassing the RWM would allow Inward Rod motion but the RBM will prevent any Outward rod motion.
Distracter 2:	No Outward rod motion is correct. However, under these conditions Inward rod motion is not allowed by the RWM except for a Manual SCRAM.
Distracter 3:	Inward rod motion using "Emergency In" is normally allowed even under faulted conditions. However, under these conditions Inward rod motion is not allowed by the RWM except for a Manual SCRAM.
K/A System:	201002 Reactor Manual Control System
K/A Number:	K3.01 Knowledge of the effect that the loss or malfunction of the REACTOR MANUAL CONTROL SYSTEM will have on following: Ability to move control rods
K/A Value:	3.4/3.4
DAEC Objective Number:	72.00.00.02a
	72.02.01.06
DAEC Objective Statement:	Describe the operation of the following principle Reactor Manual Control System components: a. Rod select matrix Evaluate plant conditions and control room indications to DETERMINE if the Reactor Manual Control System is operating as expected, and IDENTIFY any actions that may be necessary to place the Reactor Manual Control System in the correct lineup.
Cognitive Level:	3SPK
Source:	New

Operationally Validity: Reactivity manipulations and system knowledge during abnormal events

OE: Lasalle Unit 2 11/17/1999 Failure #403

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

39. **RO ONLY**

A plant transient has occurred resulting in an ATWS.
While attempting to verify all rods inserted the 1C05 operator places the "Rod Select Power" switch in the OFF position and LEAVES IT THERE.

Which of the following RIPs **CANNOT** be accomplished with these conditions?

a. RIP 102.1 "Repeated Manual Scram"

b. RIP 103.2 "Increase CRD Cooling Flow and Pressure".

c. RIP 103.3 "Manually Drive Control Rods".

d. RIP 103.4 "Vent Individual CRD Exhaust Lines".

ANSWER: c

Answer: The position of the Rod Select Power switch to OFF prevents selecting rods and effectively de-energizes RMCS by removing power from the ROD SELECT MATRIX and providing a Select Block. IPOI 5 will direct the proper use of this switch and would be the step at which the operator mispositioned the switch. When implementing the RIP for manually driving the rods the operator will not be able to select rods on the Rod Select matrix. The correction for this would be for the operator to review IPOI 5 "Reactor Scram" which will direct returning the switch to ON. This will then allow manual rod motion.

REFERENCE: SD 856.1 Rev 4 page 10, IPOI 5 Rev 33 page 5, RIP 103.3 Rev 3 page 1

Distracter 1: Possible RIP for consideration. However, the power supply associated with this RIP is RPS and 125 VDC, which are not affected by the switch position. IPOI 5 will direct the proper use on this switch. OI 856.1 has directions on positioning this switch. However, it is directed during refueling outages.

Distracter 2: Possible RIP for consideration. However, the power supply associated with this RIP is not affected by the switch position.

Distracter 3: Possible RIP for consideration. However, the power supply associated with this RIP is RPS and not affected by the switch position. OI 856.1 has directions on positioning this switch. However, it is directed during refueling outages.

K/A System: 201002 Reactor Manual Control System

K/A Number: A2.03 Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM: and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Select block.

K/A Value: 2.9/2.8

DAEC Objective Number: 72.02.01.06

.95.03.01.09

DAEC Objective Statement: Evaluate plant conditions and control room indications to DETERMINE if the Reactor Manual Control System is operating as expected, and IDENTIFY any actions that may be necessary to place the Reactor Manual Control System in the correct lineup

For each Rod Insertion Procedure identify the effect of the procedural actions on the: CRD system components

Cognitive Level:	2RI
Source:	New
Operationally Validity:	IPOI 5 SCRAM procedure actions and possible error noted in simulator scenarios, which would remove a possible success path for rod insertion during an ATWS.
OE:	This is an operator error noted in simulator scenarios. The operators typically notice they can not select rods and determine it is from not completing IPOI 5 actions.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

40. 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 speed demand and the Positioner position.

ANSWER:	d
Answer:	The scoop tube will automatically lockup if High Speed Demand vs. Positioner Feedback reaches .05 vdc. This is the condition indicated.
REFERENCE:	SD 264 Rev 5, ARP 1C04B C-2 Rev 6
Distracter 1:	Positioner has an electrical stop, but the deviation lockup should occur much sooner.
Distracter 2:	Positioner has an mechanical stop, but the deviation lockup should occur much sooner.
Distracter 3:	Milliamp output is something that is checked after a lockup but it does not cause the lockup.
K/A System:	202002 Recirculation Flow Control System
K/A Number:	A3.03 Ability to monitor automatic operations of the RECIRCULATION FLOW CONTROL SYSTEM including: Scoop tube operation.
K/A Value:	3.1/3.0
DAEC Objective Number:	12.00.00.02c
DAEC Objective Statement:	Identify the conditions that allow or cause the following events to occur c. Scoop tube lockup
Cognitive Level:	II
Source:	New
Operationally Validity:	Understanding of reactivity control system reason during an inadvertent reactivity addition event.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

41. The plant is being shut down.
All Control Rods have been inserted.
RPV pressure is 220 psig.
RHR is in Standby/Readiness Condition per OI 149 "RHR System" with NO pumps running.
The "B" Recirculation pump is RUNNING.
The "A" Recirculation pump has been SECURED.
The "A" Recirculation pump Suction, Discharge, and Discharge Bypass Valves are OPEN.

Which of the following will occur if RPV water level were to drop to 119.5"?
(The DEFAULT loop is selected for injection and Drywell pressure is **NOT** rising)

a. The "A" Recirc Loop Discharge and Discharge Bypass valves will receive a CLOSE signal.

b. The "A" RHR Loop LPCI Inboard and Outboard Injection valves will receive a CLOSE signal that is sealed in for 10 minutes from the time that a loop is selected.

c. The "B" Recirc pump will trip after the Discharge and Discharge Bypass valves CLOSE.

d. The "B" RHR Loop Inboard LPCI Inject valve will OPEN and RHR will immediately inject into the RPV.

ANSWER:	b
Answer:	This is normal system operation for a break detected in the "A" Loop or no breaks detected.
REFERENCE:	SD-149 Rev 8 pages 20 and 26
Distracter 1:	This would be true if the "A" loop where the default loop or a break was detected in the "B" loop. The Loop Select logic place the Recirc system in a position to detect which Loop has a break or if there is no break the "B" Loop will select by default.
Distracter 2:	The "B" Recirc pump will trip and during most cases this is the trip function that occurs. However, in single loop operation LPCI Loop Select can not determine the Loop with a break if unless both Recirc pumps are secured. The logic will trip the running pump if it doesn't sense both pumps running.
Distracter 3:	Th "B" LPCI inject valve will open and be ready to inject and RPV pressure is below the shutoff head of the RHR pumps. However, the RHR pumps do not start on a LPCI Loop Select signal. There has not been an initiation signal to start the pumps. There is no 2 psig drywell pressure and RPV level is above 64 inches.
K/A System:	203000 RHR/LPCI: Injection Mode
K/A Number:	A4.11 Ability to manually operate and/or monitor the control room: Indicating lights and alarms.
K/A Value:	3.7/3.5
DAEC Objective Number:	RO 2.03.01.22
DAEC Objective Statement:	Describe how the RHR system responds to a LPCI Loop Select/LPCI auto initiation signal during various modes of operation and any actions that are required to verify proper response.
Cognitive Level:	3PEO – The Candidate will have to predict the system response of both Recirc and RHR based on system response to RPV water level reaching 119.5 inches.
Source:	ILC Exam Bank - slightly modified
Operationally Validity:	ECCS system response to a ECCS signal.
OE:	Systems have failed to respond to automatic signals at DAEC and in the industry.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

42. **RO ONLY**
Given the following conditions:

- The plant is at 75% power
- MO-1913 "B RHR Pump Torus Suction Valve" is being cycled for post maintenance testing and is currently CLOSED.
- All other RHR system components are in their normal standby lineup
- A steam break causes drywell pressure to reach 3 psig
- RPV water level is 190"

Which of the following CORRECTLY describes the response of the "B" RHR Pump Torus Suction valve, MO-1913, and the "B" RHR pump?

a. MO-1913 automatically OPENS and the "B" RHR Pump automatically STARTS after MO-1913 is fully OPEN.

b. MO-1913 must be manually OPENED and the "B" RHR Pump automatically STARTS after MO-1913 is fully OPEN.

c. MO-1913 automatically OPENS and the B" RHR Pump must be STARTED after MO-1913 is fully OPEN.

d. MO-1913 must be manually OPENED and the "B" RHR Pump must be STARTED after MO-1913 is fully OPEN.

ANSWER:	d
Answer:	The "B" RHR pump starts and immediately trips due to no suction path. MO-1913 has no automatic opening signals. The valve should be manually opened and then the pump can be manually restarted.
REFERENCE:	SD-149 Rev 7,
Distracter 1:	There are no automatic open signals to MO-1913. The RHR pump will have to be taken to stop to reset the trip signal after the valve is reopened.
Distracter 2:	Manual opening the valve is correct. However, the RHR pump will have to be taken to stop to reset the trip signal after the valve is reopened.
Distracter 3:	The RHR pump will have to be manually started. However, there are no automatic open signals to MO-1913.
K/A System:	203000 RHR/LPCI: Injection Mode
K/A Number:	2.1.2 Knowledge of operator responsibilities during all modes of plant operation.
K/A Value:	3.0/4.0
DAEC Objective Number:	2.03.01.04
DAEC Objective Statement:	Describe the RHR system interlocks, including purpose, setpoint, logic, and when/how they are bypassed, overridden or reset.
Cognitive Level:	3PEO (1998 application level was indicated)
Source:	Bank, 1998 NRC exam developed from Hope Creek exam.
Operationally Validity:	ECCS system response to a ECCS signal. The operator needs to know how to recover the RHR system during a fault, which can be recovered, and possibly provide adequate core cooling.
OE:	Systems have failed to respond to automatic signals at DAEC and in the industry.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

43. Following a full Group I Isolation at full power, HPCI received an auto initiation signal on RPV low level.
During the Group I Isolation, the HPCI pump flow signal was lost to the flow controller, sensing a constant ZERO gpm flow signal.

Which of the following describes the HPCI system response if NO operator action is taken?

The HPCI turbine will...

a. remain at minimum speed.

b. trip on high RPV water level.

c. trip as soon as the signal is lost.

d. trip on overspeed and remain shutdown.

ANSWER:	b
Answer:	With no flow signal to the flow controller the controller will send a signal to the HPCI Turbine for max flow. This will try to run HPCI at max speed to increase the flow. RPV level will go to 211" at which time the HPCI turbine will trip on high level.
REFERENCE:	SD 154 Rev 4
Distracter 1:	With no sensed flow, flow demand will cause HPCI to run at max speed to increase flow. This is the indication of a lost inverter.
Distracter 2:	The flow signal is not required to initiate the HPCI start up.
Distracter 3:	If the HPCI reaches the overspeed limit it will not stay shutdown. Speed will reduce to a point < the overspeed setpoint and the turbine will restart.
K/A System:	206000 High Pressure Coolant Injection
K/A Number:	K3.01 Knowledge of the effect that a loss of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on the following: Reactor water level control
K/A Value:	4.0/4.0
DAEC Objective Number:	5.00.00.02a
	5.02.01.03
DAEC Objective Statement:	Describe the operation of the following principle HPCI System components: a. HPCI Turbine
	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:	3PEO / 2RI
Source:	Bank 2000 Dresden NRC exam, 1998 Cooper NRC exam
Operationally Validity:	Understanding of ECCS system design and operations.
OE:	HPCI failures challenge operators during scenarios.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

44. The plant is at full power.

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
Answer:	This indicator is in place for this purpose and would be the only way to detect this condition prior to system initiation.
REFERENCE:	ARP 1C03A C-8 Rev 7; SD-151
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 the described leak pressurized CS discharge header.
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 Number:	4.01.01.02
DAEC Objective Statement:	Evaluate 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:	II
Source:	Bank - 2001 NRC RO Exam
Operationally Validity:	Knowledge of ECCS designs which provide operators indications of system failure.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

45. A transient has occurred while at power, which has resulted in a Bus 1A3 lockout followed by a hydraulic ATWS.
The 1C05 operator initiates Standby Liquid Control (SBLC) as directed.

Which of the following CORRECTLY describes the expected condition of the SBLC Squib valves based on their respective power supplies?

a. Both will have actuated; they are powered from respective divisions of 125 VDC.

b. Both will have actuated; they are powered from Uninterruptible AC.

c. Only one will have actuated; it is powered from B RPS.

d. Only one will have actuated; it is powered from its associated pump breaker on 1B44.

ANSWER:	d
Answer:	Power for the SQUIB valves comes from the pump power supply line. In this case 1B44.
REFERENCE:	SD 153 Rev 4 page 29, ARP 1C05A F-3 Rev 3
Distracter 1:	No power to A SBLC pump/Squib valve due to 1A3 lockout; power supplies are 1B34 &1B44.
Distracter 2:	No power to A SBLC pump/Squib valve due to 1A3 lockout; power supplies are 1B34 &1B44.
Distracter 3:	Power supply is 1B44
K/A System:	211000 Standby Liquid Control
K/A Number:	K2.02 Knowledge of electrical power supplies to the following: Explosive valves
K/A Value:	3.1/3.2
DAEC Objective Number:	6.00.00.03
DAEC Objective Statement:	
Cognitive Level:	1F
Source:	Bank - 1999 NRC Retest exam series A
Operationally Validity:	Knowledge of power supplies to safety equipment required for Reactor Shutdown in the event of an ATWS.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

46. A turbine trip from full power has caused a reactor scram.
RPV level lowered to 110" during the initial transient but has been restored to the normal operating band for two minutes.
The scram has **NOT** been reset?

Select the answer that correctly describes the status of the RPS Backup Scram valves under these plant conditions.

Both Backup Scram valves should be...

a. energized and OPEN (venting)

b. energized and CLOSED (not venting)

c. deenergized and OPEN (venting)

d. deenergized and CLOSED (not venting)

ANSWER:	a
Answer:	Note: ARI solenoids would have also have energized to vent, but would reset after 45 seconds. However, the backup scram valves do not reset until the scram is reset.
REFERENCE:	SD 358 Rev 5 pages 12 and 33
Distracter 1:	Backup scram valves would be energized and open.
Distracter 2:	Backup scram valves would be energized and open
Distracter 3:	Backup scram valves would be energized and open
K/A System:	212000 Reactor Protection System
K/A Number:	K1.08 Knowledge of the physical connections and/or cause-effect relationships between REACTOR PROTECTION SYSTEM and the following: Control rod and drive mechanism.
K/A Value:	3.7/3.9
DAEC Objective Number:	22.00.00.07
DAEC Objective Statement:	Describe the operation of the following principle Reactor Protection System components: f. Backup Scram Valves
Cognitive Level:	1I
Source:	Bank - 1998 ILC Retest (Cover page indicates 1998 footer indicates 1999)
Operationally Validity:	Power supplies to safety equipment necessary to shutdown the plant.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

47. You are directed by OI 878.2 "Intermediate Range Neutron Monitoring System" to closely monitor IRMs when switching between Range 6 and Range 7.

What is the reason for this direction?

a. The affects of Power Range Gamma's are starting to overcome the affects of Decay Gamma's and will cause power to show a faster rate of rise.

b. The SRM Rod Blocks are bypassed at this point and IRM spiking has occurred due to noise when the SRM circuitry bypasses the SRMs.

c. The Mean Square Analog Unit is switched into the circuit at this point and starts applying the Campbelling calculations to the IRM output.

d. The IRMs shift between Low and High Frequency Amplifiers at this point and could affect the IRM output signal.

ANSWER:	d
Answer:	This is described in the System Description for IRMs and is noted in the OI because the shift from Low to High Frequency Amps could show an unexpected IRM reading.
REFERENCE:	OI 878.2 Rev 19 page 6. SD 878.2 Rev 5 pages 13, 14, 16, 17, 19, and 27
Distracter 1:	Power Gamma's do start to overcome the Decay and Background Gamma's at higher power. However, the IRMs are gamma compensated through all ranges and there is no significant effect at this point.
Distracter 2:	The SRMs are automatically bypassed by IRM range switch position. However, this occurs at Range 8 and there is no noise from SRM circuitry from this switching. There is a caution about driving multiple SRMs and noise induced SCRAMs.
Distracter 3:	The Mean Square Analog Unit does perform the Campbelling function for the IRMs, which is for gamma compensation. However, this is always functioning and there is no switching that occurs.
K/A System:	215003 Intermediate Range Monitor
K/A Number:	A4.07 Ability to manually operate and/or monitor in the control room: Verification of proper functioning/ operability
K/A Value:	3.6/3.6
DAEC Objective Number:	79.00.00.02 79.01.01.01
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the IRM System is operating as expected, and identify any actions that may be necessary to place the IRM System in the correct lineup relate the precautions and limitations, operating cautions, or procedural notes of OI-878.2 to any component or IRM System operating status
Cognitive Level:	1P
Source:	New
Operationally Validity:	OI note and system knowledge.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

48. **Review the indication given in the Support Material Booklet**
RO ONLY
The plant was at full power when a transient occurred that required insertion of a SCRAM.
The plant experienced an electrical ATWS.
Control Rods WERE SUCCESSFULLY INSERTED with the individual test switches per the RIPs.
Plant conditions were stabilized.
Alarm 1C05A D-5 "SRM Downscale" is received.

Which one of the following is correct for these plant conditions and given indications?

a. The 1C05 Operator has not completed the IPOI 5 Immediate actions to Drive IN the SRMs.

b. The "C" SRM DNSC has deselected the SRM Drive Motors to prevent SRMs from going below T.S. required counts.

c. "C" SRM has alarmed one decade above the alarm setpoint. Inform the OSS and write a WRC to repaired/recalibrate "C" SRM.

d. IRMs are DRIVING into the core and when the IRMs are full in the Retract Permit light will come ON and then SRMs can be Driven IN.

ANSWER:	a
Answer:	IPOI 5 immediate actions require the IRMs and SRMs be fully inserted. During an ATWS IRMs are inserted but the SRMs are not. This prevents saturation of the SRMs while at power. Following the exit of ATWS the 1C05 operator should complete the immediate actions of IPOI 5 to drive the SRMs into the core.
REFERENCE:	IPOI 5 Rev 33 step 3.2 (7) page 5, OI 878.1 Rev 13 Step 6.1 pages 9 and 10
Distracter 1:	"C" SRM is below the T.S. value of 3 CPS for SRMs. However, there is no interlock to de-energize the drive motors if level drop below 3 CPS while the SRMs are withdrawn and driving into the core.
Distracter 2:	The "C" SRM has alarmed at the appropriate point <3 CPS. Some confusion by operators in the past on reading log scale meters in this range has occurred. 10^0 is some time confused with 10 and if this error is made the reading shown would be mistaken for 20 which would be about 1 decade too high.
Distracter 3:	The SRMs when fully inserted will give the retract permit light following a scram. The IRMs are showing they have been fully inserted and they will not get a retract permit light under these conditions.
K/A System:	215004 Source Range Monitor System
K/A Number:	2.4.49 Ability to perform without references to procedure those actions that require immediate operation of system components and controls.
K/A Value:	4.0/4.0
DAEC Objective Number:	78.00.00.04
DAEC Objective Statement:	Describe the operation of the following principle SRM System components a. SRM Detectors and Drive Mechanisms
Cognitive Level:	2DR – The candidate must recognize the relationship between SRM drive control and the indicated SRM and plant responses.
Source:	New

Operationally Validity: SCRAM actions required by the operator.

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

49. The plant is at 85% power.
1C05A D-2 "APRM DOWNSCALE" annunciator alarms.
The "A" APRM indicates a downscale condition.

When does the APRM alarm occur AND with NO other plant changes what other annunciator will alarm?

a. Alarm at 12% and 1C05B D-6 "RWM ROD BLOCK"

b. Alarm at 5% and 1C05B D-6 "RWM ROD BLOCK"

c. Alarm at 12% and 1C05B A-6 "ROD OUT BLOCK"

d. Alarm at 5% and 1C05B A-6 "ROD OUT BLOCK"

ANSWER:	d
Answer:	At 5% APRM scale the Downscale alarm occurs. 6 sec later the Rod Block annunciator occurs. The Block is enforced immediately.
REFERENCE:	1C05B A-6 Rev 9, 1C05A D-2 Rev 3
Distracter 1:	12% power is the upscale Rod Block with the Mode Switch not in Run and the RWM Rod Block does not interface with the APRM at this point.
Distracter 2:	5% power is correct. However, the RWM Rod Block does not interface with the APRM at this point.
Distracter 3:	A Rod Block will occur. However, 12% power is the upscale Rod Block with the Mode Switch not in Run
K/A System:	215005 Average Power Range Monitor/Local Power Range Monitor
K/A Number:	K4.01 Knowledge of AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR design feature(s) and/or interlocks which provide for the following: Rod withdrawal blocks
K/A Value:	3.7/3.7
DAEC Objective Number:	81.01.01.03
	81.01.01.07
	82.00.00.04
	82.01.01.02b

DAEC Objective Statement: Evaluate plant conditions and control room indications to determine if the APRM system is operating as expected, and identify any actions that may be necessary to place the APRM system or the reactor plant in the correct condition

List the signals or conditions which cause an APRM system Downscale Alarm, Upscale Alarm, Inop or Upscale Trip, including setpoints and logic. Describe how they are bypassed

List the signals which cause a RBM Rod Block including purpose, setpoint, and logic. Describe how they are bypassed and how they are reset

Given a Rod Block Monitor System operating mode and various plant conditions, predict how the Rod Block Monitor System will be impacted by failures in the following support systems:
b. APRM System

Cognitive Level: 1I
Source: New
Operationally Validity: ARP setpoint and reactivity monitoring system operation.
OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

50. **Review the indication given in the Support Material Booklet**
RO ONLY

The plant is at 64% Reactor power.
All other plant and system conditions are normal.
The "E" APRM is bypassed.

Based on the indications shown, how many LPRM inputs does "E" APRM have

and

if the "E" APRM is unbypassed what will occur?

a. 12 LPRM inputs, ½ Scram
b. 12 LPRM inputs, Full scram
c. 6 LPRM inputs, ½ Scram
d. 6 LPRM inputs, Full scram

ANSWER:	a
Answer:	The indication is ½ volt per LPRM input and with less than 13 input the "E" APRM will generate an inop signal. When the APRM is unbypassed a ½ scram on the "A" side will occur. There has been some misunderstanding on the way to interpret APRM and RBM input. RBM is 1 volt per input and APRMs are ½ volt per input.
REFERENCE:	SD 878.3 Rev 5 pages 29,31,and 35
Distracter 1:	There are 12 LPRM inputs. However, a full scram would not occur under these conditions. There are some conditions on APRMs where single failures will cause a full scram, this is not one of the conditions.
Distracter 2:	There would be a ½ scram. However, there are 12 LPRM inputs to the APRM.
Distracter 3:	There are 12 LPRM inputs and there would only be a ½ scram There are some conditions on APRMs where single failures will cause a full scram, this is not one of the conditions.
K/A System:	215005 Average Power Range Monitor/Local Power Range Monitor
K/A Number:	A4.03 Ability to manually operate and/or monitor in the control room: APRM back panel switches, meters and indicating lights
K/A Value:	3.2/3.3
DAEC Objective Number:	80.00.00.03 80.01.01.03
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the LPRM system is operating as expected, and identify any actions that may be necessary to place the LPRM system in the correct lineup Describe the interrelationships between the LPRMs, the APRMs, and the RBM system, including the effects on one from an operation or failure of the other
Cognitive Level:	3SPK

Source: New

Operationally Validity: Improper operation of APRMs can cause scrams.

OE: There is some confusion on APRM inputs and RBM inputs and how they are monitored in the back panel area.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

51. **RO ONLY**

The plant is cooling down from full power operations.
The GEMAC Reference Leg Backfill System has been out of service for 3 weeks.
RPV level is 190 inches and stable.

Which of the following would be an EXPECTED plant response as the RPV cooldown and pressure reduction continues and what should be done if this occurs?

a. LI-4560 "B GEMAC Level" instrument on 1C05 shows a 2 inch step change in level. Level is expected to slowly return to normal.

b. LI-4560 "B GEMAC Level" instrument on 1C05 shows a 2 inch step change in level. The level instrument is inoperable and I&C must refill the reference leg to recover the instrument to service.

c. LI-4540 "B Yarway Level" Wide-Range instrument on 1C05 shows a 2 inch step change in level. Level is expected to slowly return to normal.

d. LI-4540 "B Yarway Level" Wide-Range instrument on 1C05 shows a 2 inch step change in level. The level instrument is inoperable and I&C must refill the reference leg to recover the instrument to service.

ANSWER:	a
Answer:	Anytime the Reference Leg Backfill system is out of service for 7 days performance of OI-880, J-1 section 6.1 is required. Notching is expected when dropping RPV pressure. The Narrow range GEMAC level instruments are susceptible to notching and if this occurs we are directed to inform the OSS for notches >1 inch. The corrective action for a step change of this type would be to increase monitoring and to allow the bubbles to work themselves out of the reference leg. The level indication will slowly return to normal. OI-880 directs these actions for the given plant conditions.
REFERENCE:	OI-880 Rev 9 pages 15 and 16.SD-880 Rev 8 pages21-24, 29, and 30.EOP ED Bases Document Rev 7 page 21.
Distracter 1:	This is an expected condition. However, The level instrument will slowly return to normal on its own as the bubbles work their way up and out of the reference leg and the leg refills from condensation.
Distracter 2:	Level in instruments that have "NOTCHING" occur will slowly return to normal. However, the wide-range Yarways are not susceptible to notching.
Distracter 3:	This would be of some concern and possible indicates this instrument has a problem that may require I&C to investigate. However, the wide-range Yarways are not susceptible to notching and this would not be an expected plant response.
K/A System:	216000 Nuclear Boiler Instrumentation
K/A Number:	A2.11 Ability to (a) predict the impacts of the following on the NUCLEAR BOILER INSTRUMENTATION: and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Heatup or cooldown of the reactor vessel.
K/A Value:	3.2/3.3
DAEC Objective Number:	88.00.00.05

DAEC Objective Statement: Explain how non-condensable gases coming out of solution can affect cold leg level instruments, when this is expected to occur and what methods are used to determine level after ED

Cognitive Level: 2RI

Source: NEW

Operationally Validity:

OE: Notching has occurred at DAEC during normal plant cooldowns before the Reference leg back fill system was installed.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

52. The plant is at 75% power.
The RCIC turbine has been started CST to CST using the flow-indicating controller.
RCIC is at 3000 RPM and stable.
Other plant conditions are normal with the exception of those systems lined up to support the RCIC testing.
Annunciator 1C04C C-9 " RCIC INVERTER POWER FAILURE" Alarms and RCIC Inverter failure is confirmed.

Which of the following is correct concerning the RCIC turbine?

RCIC will ...

a. remain running at 3000 rpm.

b. tripped on electrical overspeed.

c. tripped on mechanical overspeed.

d. be running at idle speed (approx. 1000 rpm).

ANSWER:	d
Answer:	With an inverter failure the RCIC Turbine will reduce speed to idle about 1000 rpm if running on the flow controller.
REFERENCE:	1C04C C-9 Rev 2, SD 150 Rev 4 pages 36 and 37
Distracter 1:	This is indication that would occur if the RCIC turbine were running on the "Test Pot".
Distracter 2:	Possible error if candidate assumes a loss of inverter will cause the flow controller to send a zero flow signal and call for max flow. However, speed control is lost on loss of inverter causing the turbine to run at idle.
Distracter 3:	Possible error if candidate assumes a loss of inverter will cause the flow controller to send a zero flow signal and call for max flow and the electrical overspeed power is lost. However, speed control is lost on loss of inverter causing the turbine to run at idle and the electrical overspeed is not affected.
K/A System:	217000 Reactor Core Isolation Cooling System
K/A Number:	K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR CORE ISOLATION COOLING SYSTEM: Electrical power
K/A Value:	3.4/3.5
DAEC Objective Number:	3.01.01.02
DAEC Objective Statement:	given a RCIC system operating mode and various plant conditions, predict how the RCIC System will be impacted by the following support system failures: o. RCIC Inverter
Cognitive Level:	3PEO
Source:	New
Operationally Validity:	ARP notes and system operational knowledge.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

53. **Review the indication given in the Support Material Booklet**

The Plant was at full power.
A loss-of-coolant accident has occurred resulting in a successful reactor scram.
RPV water level lowered to 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.

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
Answer:	The indications given are for a RCIC mechanical overspeed condition. MO-2405 will close on electrical or mechanical overspeed but a limit switch in the open circuit prevents moving the valve in the open direction when the trip is due to a mechanical overspeed condition. This is the only indication in the control room of the type of trip that occurred.
REFERENCE:	ARPs 1C04C, A-5 and A-6
Distracter 1:	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.
Distracter 2:	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.
Distracter 3:	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..
K/A System:	217000 Reactor Core Isolation Cooling System
K/A Number:	A3.01 Ability to monitor automatic operations of the REACTOR CORE ISOLATION COOLING SYSTEM including: Valve operation
K/A Value:	3.5/3.5
DAEC Objective Number:	3.02.01.05

DAEC Objective Statement:	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:	2DR
Source:	Bank 2001 NRC RO Exam
Operationally Validity:	ARP actions and knowledge of level control equipment.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

54. The plant was operating at power.
A transient occurred, a SCRAM was successfully inserted, and the MSIVs were closed.
RPV level is 190 inches and being controlled in Auto by the Feedwater Level Control (FWLC) System.
SRVs are being used to manually control pressure between 800 and 1000 psig.
The 1C03 operator reports he is opening an SRV to reduce RPV pressure.

Which of the following would be the FIRST expected plant response in regards to cycling open the SRV?

a. An RPV High Level alarm due to void increase.

b. An RPV High Level alarm due to FWLC System response to increased steam flow.

c. An RPV Low Level alarm due to void increase.

d. An RPV Low Level alarm due to increased mass flowrate **NOT** sensed by the FWLC System.

ANSWER:	a
Answer:	Under these conditions when the SRV is opened RPV pressure will drop causing the voids in the core region to expand. This will increase the flow resistance in the core. Level will increase initially then will decrease due to loss of mass and FWLC system response to the indicated level increase.
REFERENCE:	50007 IG 8 Rev 7 pages 30 and 37. RO Task 8.04 requires manual operation of SRVs and cycling of SRVs is performed for ARP 1C03A C-5 for an open SRV.
Distracter 1:	An RPV High level will occur. However, the FWLC system will not increase level at a rate that would cause the alarm.
Distracter 2:	Voids do increase and the candidate may incorrectly assume this would cause lower density and a corresponding lower indicated level.
Distracter 3:	The mass flow rate loss is not sensed by the FWLC system because the SRVs are upstream of the steam flow sensors. However, there will be an initial increase in indicated water level due to the voiding.
K/A System:	218000 Automatic Depressurization System
K/A Number:	A1.05 Ability to predict and/or monitor changes in parameters associated with operating the AUTOMATIC DEPRESSURIZATION SYSTEM controls including: Reactor water level.
K/A Value:	4.1/4.1
DAEC Objective Number:	95.80.10.06 99.28.01.08
DAEC Objective Statement:	Evaluate the RPV and containment response to opening an SRV, and determine if containment and the SRV and its support systems are functioning as expected. Identify the actions to be taken if it is determined that an SRV is indicating open.
Cognitive Level:	3PEO
Source:	New
Operationally Validity:	
OE:	
Estimated Completion Time:	EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

55. **Review the indication given in the Support Material Booklet**

The plant is at full power.
A Group 3B isolation has occurred and verified to be complete.
You are ordered to override CV-4371A and the system responds as indicated in the picture on the following page.

What are the long-term implications of this system response?

a. All of the SRVs will eventually lose the ability to lift on their relief setpoint.

b. ½ of the SRVs will eventually lose the ability to lift on their relief setpoint. The other ½ are **NOT** effected.

c. All of the SRVs have lost N_2 from outside the Drywell.

d. ½ of the SRVs have lost N_2 from outside the Drywell. The other ½ are **NOT** effected.

ANSWER:	c
Answer:	With the indications given all SRVs have a limited amount of N_2 available based on the capacity of the accumulators. The Group 3 isolated CV-4371A which goes to all the SRVs and MSIVs.
REFERENCE:	SD
Distracter 1:	The MSIVs would eventually go closed on a loss of N_2 and not be able to be opened and the SRVs will loss the external N_2 source. However, this will not effect the relief setpoint of the SRVs, which is a common misconception.
Distracter 2:	The MSIVs would eventually go closed on a lose of N2and not be able to be opened and the SRVs will loss the external N_2 source. However, this will not effect the relief setpoint of the SRVs, which is a common misconception, and CV-4371A goes to all the SRVs not ½.
Distracter 3:	The "B" side of Group 3 closes CV-4371A the "A" side closes CV-4371C that isolates N_2 to the DW-Torus vacuum breakers. CV-4371A goes to all SRVs.
K/A System:	223001 Primary Containment System and Auxiliaries
K/A Number:	K1.08 Knowledge of the physical connections and/or cause-effect relationships between PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES and the following: Relief/safety valves
K/A Value:	3.6/3.8
DAEC Objective Number:	95.11.01.03
DAEC Objective Statement:	Evaluate the effect of installation or restoration of each of the EOP defeats on plant systems and equipment
Cognitive Level:	3PEO
Source:	New
Operationally Validity:	System knowledge and EOP action requirements.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

56. **Review the indication given in the Support Material Booklet**
A plant transient has occurred from full power.
Defeat 4 was inserted and verified correct.
Other EOP actions have been taken and some time later, the BOP observes the panel indications on the following page.

Which of the following BY ITSELF would account for the indications observed?

a. Drywell pressure is below 2 psig.

b. Drywell sprays have been initiated.

c. Drywell H_2 or O_2 concentration is >4%.

d. Drywell temperature is below the over temperature alarm setpoint.

ANSWER:	b
Answer:	In this case defeat 4 has been inserted at some point and verified. When Drywell sprays are initiated the Drywell fans will automatically shutdown to prevent damaging the fans.
REFERENCE:	Defeat 4 Rev 5, SD 760 Rev 4 page 6
Distracter 1:	Drywell pressure going above 2 psig will shift fans to slow but with the Defeat 4 installed fans would run in fast. Dropping below 2 psig would have no effect on the Defeat 4 the fans would still be in fast.
Distracter 2:	Drywell H2 and O2 may be viewed as explosive hazard. However, there are no automatic actions connected with drywell cooling.
Distracter 3:	Drywell temperature above the alarm setpoint will shift fans to fast and if temperatures return to normal the fans would go back to their original speed. However, defeat 4 would over ride this function and the fans would not secure as shown.
K/A System:	223001 Primary Containment System and Auxiliaries
K/A Number:	A4.12 Ability to manually operate and/or monitor in the control room: Drywell coolers/chillers.
K/A Value:	3.5/3.6
DAEC Objective Number:	68.01.01.06
DAEC Objective Statement:	Describe the Primary Containment Ventilation System interlocks, including purpose, setpoints, logic, and when/how they are bypassed
Cognitive Level:	3SPK
Source:	New
Operationally Validity:	Ability to verify EOP actions and system response.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

57. The plant is at full power and the "A" RPS bus becomes de-energized.

Which of the following correctly describes the plant response to this event?

a. Inboard MSIV control power and position indication will be lost.

b. PCIS Div 1 Groups 1 through 5 (excluding MSIVs) will isolate.

c. A Scoop Tube Lockup will occur on the "A" Recirc MG set.

d. The "A" SBDG 1G31 will automatically start.

ANSWER:	b
Answer:	On loss of "A" RPS the Div 1 PCIS loses power an isolates with the exception of the MSIVs. The DC powered solenoids will hold the MSIVs open.
REFERENCE:	AOP 358 Rev 18 page 3
Distracter 1:	This is a possible choice. However, this will occur if 125 vdc is lost.
Distracter 2:	This is a possible choice. However, this occurs if 1Y11 is lost
Distracter 3:	This is a possible choice. However, this will occur if 1A3 is lost which can also lead to losing the "A" RPS.
K/A System:	223002 Primary Containment Isolation System/Nuclear Steam Supply Shut-Off
K/A Number:	K6.08 Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF: Reactor protection system
K/A Value:	3.5/3.7
DAEC Objective Number:	22.02.01.07 94.11.01.04
DAEC Objective Statement:	Given a Reactor Protection System operating mode and various plant conditions, predict how each supported system will be impacted by the following Reactor Protection System failures: b. trip of a Motor-Generator c. Trip of an EPA Breaker Relate the automatic actions to the immediate and follow-up actions directed by AOP 358
Cognitive Level:	2RI
Source:	Bank: Fermi 98 NRC exam (modified)
Operationally Validity:	AOP response and system knowledge.
OE:	Loss of RPS has occurred at DAEC.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

58. **Review the indication given in the Support Material Booklet**

The plant was at full power when a spurious Group 1 inboard isolation occurred. The following annunciators are currently ALARMING:

- 1C03A C-5 "SRV/SV Tailpipe HI Pressure or HI Temp"
- 1C03A D-5 "LLS "A" or "B" Armed"
- 1C05A C-4 "Reactor Vessel HI Pressure Trip"

Which of the following is correct in regards to the panel indications on the following page?

a. PSV 4407 has failed to open.

b. The operator has reset the "B" LLS logic on 1C03.

c. The initial pressure reduction by LLS has just started.

d. The initial LLS pressure reduction is complete and LLS is cycling normally.

ANSWER:	a
Answer:	LLS has armed and is currently RPV pressure is >1055 psig. PSV 4407 should have opened at 1110 psig for the initial LLS Blowdown but this has not occurred.
REFERENCE:	SD 183.1 Rev 4, ARP 1C03A D-5 Rev 5, 1C03A C-5 Rev 11, 1C05B C-4 Rev 4
Distracter 1:	The "B" LLS logic does control PSV 4407. However, even if the reset push button is held in reset under these conditions PSV 4407 would be open.
Distracter 2:	A LLS blowdown has commenced. However, PSV 4407 should have opened first to initiate the blowdown. With indication of RPV pressure >1025 psig and 25 psig in any SRV tailpipe, PSV 4407 should be opened.
Distracter 3:	PSV 4401 is indicating normally for LLS cycling. However, with the alarms given the RPV pressure is > 1055 psig and PSV 4407 should be open.
K/A System:	239002 Safety Relief Valves
K/A Number:	A3.08 Ability to monitor the automatic operation of the RELIEF/SAFETY VALVES including: Lights and alarms.
K/A Value:	3.6/3.6
DAEC Objective Number:	8.03.01.03
DAEC Objective Statement:	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:	3SPK
Source:	New
Operationally Validity:	Automatic actions for ECCS system operation.
OE:	SRVs and automatic system actions have failed in the industry and at DAEC.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

59. The plant is currently at 540 MWe.
LOAD SET was inadvertently placed at 550 MWe.
All other Turbine controls are normal.

As Reactor power is raised which of the following is the correct plant response?

a. The Turbine Supervisory Panel will sense a load imbalance at 575 MWe and a Turbine trip will occur.

b. The 100% Load Limit is in effect at this power level which will allow the Turbine to be loaded to full power.

c. When Turbine load reaches 550 MWE number 1 Bypass Valve will start opening to control turbine inlet pressure.

d. Turbine Control Valves will reach 90% open when Turbine load reaches 561 MWe and a SCRAM will occur.

ANSWER:	c
Answer:	With pressure set at 550 MWe, Reactor pressure may be increased until turbine out put reach the 550MWe limit. At that time the LVG will pass the signal from Load Set, limiting any further increase in turbine load. The #1 Bypass valve will open to control pressure and an alarm will come in when the Bypass valve reaches 20% open.
REFERENCE:	SD 693.2a Rev 3
Distracter 1:	There is a load reject input to the EHC logic. However, this is NOT the input signal that provides the trip.
Distracter 2:	The 100% load limit is in effect at this power. However, this would NOT allow the turbine to go to full load because the Load set is at a lower value and would be the controlling signal.
Distracter 3:	As reactor power and steam throttle pressure increase the control valves will close down. 561Mwe is about 90% between a load set of 550Mwe and normal load set of 666Mwe. However, there is no trip function to RPS from these valves. There is a trip function from the Stop valve and if any 3 of them reach 90% open there will be a scram signal generated.
K/A System:	241000 Reactor/Turbine Pressure Regulating System
K/A Number:	K5.05 Knowledge of the operational Implications of the following as they apply to REACTOR/TURBINE PRESSURE REGULATING SYSTEM: Turbine inlet pressure vs. turbine load.
K/A Value:	2.8/2.9
DAEC Objective Number:	52.00.00.05d
DAEC Objective Statement:	Describe the operation of the following principle EHC Logic System components: d. Load Control Unit
Cognitive Level:	3PEO
Source:	New
Operationally Validity:	System operational knowledge and RPV reactivity control by pressure set.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

60. **RO ONLY**
OI 644 "Condensate and Feedwater Systems" directs the verification of Condensate/Feed system being filled and vented prior to the FIRST Condensate Pump start.

Which of the following is the reason for this action?

a. Reduce the risk of water hammer and the system damage that could result.

b. To prevent pump damage due to exceeding pump vibration limits during pump startup.

c. To prevent Condensate Pump vortex limits from being exceeded and vapor binding of the pump.

d. To prevent pump run out conditions in the Condensate Pump which would cause winding degradation.

ANSWER:	a
Answer:	A caution in OI 644 during the first condensate pump start directs this action. This is common engineering practice on most of the larger plant systems to prevent system damage.
REFERENCE:	OI 644 Rev 57 page 13.
Distracter 1:	The Condensate pumps do have vibration monitoring and alarms and excessive vibration would cause pump damage. However, during startup, with pump discharge piping not filled, excessive vibration would not occur. The pump suction piping is filled from the condenser and the discharge valve is throttled. This would prevent excessive vibration even if the discharge piping were not filled.
Distracter 2:	Some pumps have vortex limits and levels designated to prevent this from occurring. However, the Condensate Pumps do not have any given and the procedure does not identify this as a reason for the caution. The suction will be flooded from the condenser side provides the required NPSH and vapor binding due would not be expected..
Distracter 3:	Pump runout is a concern and would possibly occur. However, throttling the discharge valve of the pump to be started prevents this and this is not given as a reason for the caution.
K/A System:	259001 Reactor Feedwater System
K/A Number:	K5.02 Knowledge of the operational implications of the following as they apply to REACTOR FEEDWATER SYSTEM: Water hammer
K/A Value:	2.5/2.5
DAEC Objective Number:	45.01.01.01
DAEC Objective Statement:	Relate the precautions and limitations, operating cautions, or procedural notes of OI-639, OI-644, and any applicable ARP's to any component or Feed and Condensate System operating status
Cognitive Level:	1P
Source:	New
Operationally Validity:	System Caution.
OE:	Water hammer has caused system damage in the industry.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

61. 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) COLD
2) Electronic pressure compensation

b. 1) COLD
2) None

c. 1) HOT
2) Temperature compensation

d. 1) HOT
2) None

ANSWER:	d
Answer:	The Narrow Range GEMACs are calibrated HOT and they have no compensation.
REFERENCE:	SD 880 Rev 8 page 30
Distracter 1:	RPV level control GEMACs are not calibrated cold and are not pressure compensated. This describes Fuel Zone indicators.
Distracter 2:	RPV level control GEMACs are calibrated cold. This describes the Floodup GEMACs.
Distracter 3:	RPV level control GEMACs are not temperature compensated. This describes Wide Range Yarways.
K/A System:	259002 Reactor Water Level Control System
K/A Number:	K5.03 Knowledge of the operational implications of the following as they apply to REACTOR WATER LEVEL CONTROL SYSTEM: Water level measurement.
K/A Value:	3.1/3.2
DAEC Objective Number:	88.00.00.02
DAEC Objective Statement:	(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:	1F
Source:	Bank – 2001 NRC exam
Operationally Validity:	RPV level indication knowledge.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

62. **RO ONLY**
The OSS directs you to START the "B" SBGT train WITHOUT a Group 3 isolation.

Which method below will achieve this direction?
(Assume these are the only operator actions taken)

a. Depress PB-5831B "B SBGT Test Pushbutton"

b. Place the RIS 4131B "Fuel Pool Exhaust Radiation Monitor" to TRIP TEST.

c. Take HS 5814B "B SBGT Mode Select Switch" to MANUAL then depress PB-5831B "B SBGT Test Pushbutton"

d. Take HS 5814B "B SBGT Mode Select Switch" to MANUAL then place the RIS 4131B "Fuel Pool Exhaust Radiation Monitor" to TRIP TEST.

ANSWER:	a
Answer:	This is the correct way to perform the direction given. This action will start the "B" SBGT system as long HS 5814B "B SBGT Mode Select Switch" is in Automatic mode. There are several operating modes to SBGT and the operator is responsible to perform the correct actions to achieve the desired system configuration and operating mode.
REFERENCE:	OI 170 Rev 39 page 12. SD 170 Rev 5 pages 17-19.
Distracter 1:	This action will cause the "B" SBGT train to start. However it will also cause a Group 3 Isolation.
Distracter 2:	SBGT can be operated in manual mode. However, these actions would not start the "B" SBGT train and is not procedurally directed. Once taken to MANUAL the test pushbutton would have no effect.
Distracter 3:	Taking the rad monitor to test would normally start the SBGT train and also give a Group 3 isolation. Taking HS 5814B "B SBGT Mode Select Switch" to MANUAL would prevent the SBGT train from starting but probably allow the Group 3 isolation to occur. The mode switch is located right next to the Lockout relay that causes the Group 3 isolation but has no control over the Lockout relay.
K/A System:	261000 Standby Gas Treatment System
K/A Number:	2.1.2 Knowledge of operator responsibilities during all modes of operation.
K/A Value:	3.0/4.0
DAEC Objective Number:	7.01.01.02 7.05.02.01
DAEC Objective Statement:	Identify the appropriate procedures (both normal and emergency support) that govern the SBGT System operation, include operator responsibilities during all modes of operation, and any actions required by personnel outside of the Control Room. Identify the alternate methods that can be used to start the SBGT System, and describe system response to that starting method (include which of those methods will result in a Secondary Containment Isolation)
Cognitive Level:	1I
Source:	New
Operationally Validity:	

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

63. Which one of the following conditions would PREVENT the 1G31, "A Diesel Generator", from being shutdown using the Engine Mode Selector Switch on Panel 1C93 "SBDG 1G31 Control Panel"?

    a. The DG automatically started due to bus undervoltage on 1A3.

    b. The DG automatically started due to a 2 psig in the Drywell.

    c. The DG was started by "Fast Manual Start" from the DG Room.

    d. The DG was manually started from the Control Room.

ANSWER:	b
Answer:	A LOOP signal prevents a shutdown from the DG room
REFERENCE:	SD-324 Rev. 4 pages 39-43
Distracter 1:	Undervoltage on the bus will start the SBDG. However, low voltage does not energize the ESA and ESB relays and the SBDG can be shutdown from 1C93.
Distracter 2:	Starting the SBDG with a "Fast Manual Start" will not override the 1C93 shutdown. The SBDG engine mode selector switch can still energize the stopping relay.
Distracter 3:	Starting the SBDG from the control room will not override the 1C93 shutdown. The SBDG engine mode selector switch can still energize the stopping relay.
K/A System:	264000 Emergency Generators (Diesel)
K/A Number:	K4.07Knowledge of EMERGENCY GENERATORS (DIESEL) design feature(s) and/or interlocks which provide for the following: Local operation and control
K/A Value:	3.3/3.4
DAEC Objective Number:	19.00.00.02
DAEC Objective Statement:	Describe how the SBDG responds to a trip signal.
Cognitive Level:	1I
Source:	Bank – Slightly modified LOR
Operationally Validity: 3/14 OE:	Operation of emergency equipment and system knowledge.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

64. **RO ONLY**

The plant was operating at 90% power.
Both SBDGs started and loaded onto their respective buses due to a total loss of off site power.
The 1C03 operator informs you he will be starting the "A" RHRSW pump.
You observe 1G-31 "A" SBDG voltage and frequency are slightly lower after the "A" RHRSW pump is started and running.

Is this an expected system response

and

what should be done based on these indications?

a. This is expected. Adjust SBDG speed and voltage to the desired values.

b. This is expected. However, take HS-3234A "Governor Mode (DROOP) Switch" to "PARALLEL" as soon as possible to provide more stable voltage and frequency control.

c. This is **NOT** expected. HS-3234A "Governor Mode Switch (DROOP)" should be placed in "PARALLEL" as soon as possible to prevent a SBDG trip.

d. This is **NOT** expected. A governor failure is indicated and the SBDG output breaker should be OPENED immediately to prevent a 1A3 bus lockout from occurring.

ANSWER:	a
Answer:	This is expected on pump starts. OI 324 allows you to adjust these parameters as loads are placed on and off the bus.
REFERENCE:	OI 324 Rev 52 page 10
Distracter 1:	This is expected and placing the DROOP switch to parallel when the SBDG is paralleled with another source would make these parameters more stabile. However, under these conditions the DROOP switch is to be left in UNIT.
Distracter 2:	Placing the DROOP switch to parallel when the SBDG is paralleled with another source would make these parameters more stabile. However, these conditions would be expected and under these conditions the DROOP switch is to be left in UNIT.
Distracter 3:	This would appear to be a conservative action. However, the indications are normal and tripping the output break to protect the 1A3 bus from a lock out is not directed in OI 324. This would cause the plant to be placed in a less conservative line up with only 1 essential bus.
K/A System:	264000 Emergency Generators (Diesel)
K/A Number:	A3.04 Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL) including: Operation of the governor control system on frequency and voltage control.
K/A Value:	3.1/3.1
DAEC Objective Number:	19.01.01.01 19.00.00.03

DAEC Objective Statement: Relate the precautions and limitations, operating cautions, or procedural notes of OI-324 to any component or SBDG operating status.

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: 1P
Source: New
Operationally Validity: Understanding normal system response and OI directions / notes.
OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

65. The plant is at 40% power.
Control Rod 14-31 is at position 12.
Which of the following components is designed to prevent OUTWARD rod motion if the insert line were to rupture on the CRD Mechanism to Control Rod 14-31?

a. Collet assembly.

b. Coupling spud.

c. Drive piston.

d. Stop piston.

ANSWER:	a
Answer:	If the insert line fails the under piston area would start to vent allowing outward rod motion. The Collet fingers are normally engaged except during rod motion. They would hold the rod at its current position.
REFERENCE:	SD 255 Rev 7 page 14
Distracter 1:	The coupling spud is attached to the control rod and if the rod were at position 48 it would prevent further out motion. This is observed during coupling checks. However, the rod is at Position 12 and this feature would not prevent rod motion.
Distracter 2:	The dive piston with normal system flows provides for a larger surface area on the bottom of the piston than the top and the even with a loss of CRD drive flow with the RPV at pressure the rod will drive in to the core. However, under these conditions the insert line is depressurized and this would tend to cause outward rod motion.
Distracter 3:	The stop piston will stop the inward rod motion when the rod is inserted. This component would not prevent outward rod motion.
K/A System:	201003 Control Rod and Drive Mechanism
K/A Number:	K4.07 Knowledge of CONTROL ROD AND DRIVE MECHANISM design feature(s) and or interlocks, which provide for the following: Maintaining the control rod at a given location.
K/A Value:	3.2/3.2
DAEC Objective Number:	10.07.01.05
DAEC Objective Statement:	Describe the construction and operation of the CRD Mechanism including the following components: b. collect assembly
Cognitive Level:	1B
Source:	New
Operationally Validity:	Knowledge of system design features.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

66. A startup is in progress.
Control Rod 18-15 is being notched out.

Position indication for position 18 has been lost.
The RWM-OD (Operator Display) was taken to BYPASS.
Rod 18-15 was driven IN to position 16, IAW the pull sheet, and position 16 was verified operable.
The RWM-OD was taken to OPERATE.
Rod 18-15 is again withdrawn to position 18.

Which of the following is correct AND will allow rod withdrawal of Control Rod 18-15 to position 48 to continue?

a. A RWM WITHDRAW ERROR will occur. After position 18 is SUBSTITUTED on the RWM-OD the withdraw error will clear.

b. A RWM WITHDRAW ERROR will occur. After Control Rod 18-15 is BYPASSED on the RWM- CC (Computer Chassis) the withdraw error will clear.

c. Both RWM INSERT and WITHDRAW BLOCKS will occur. After position 18 is SUBSTITUTED on the RWM-OD both rod blocks will clear.

d. Both RWM INSERT and WITHDRAW BLOCKS will occur. After Control Rod 18-15 is BYPASSED on the RWM-CC (Computer Chassis) both blocks will clear.

ANSWER:	c
Answer:	When position indication is lost the RWM will show IB and WB. Substituting the position will clear these blocks and rod withdrawal can continue.
REFERENCE:	SD 878.8 Rev 5
Distracter 1:	Substitution of position 18 is a correct action. However, a RWM withdraw error will not occur. When blocks and errors from RWM occur is a common misconception.
Distracter 2:	Bypassing the control rod is an option and done at the RWM-CC. However, a RWM withdraw error will not occur. When blocks and errors from RWM occur is a common misconception.
Distracter 3:	Both IB and WB will occur. However, bypassing the rod will not remove the withdraw block and continued rod withdrawal will not be allowed.
K/A System:	201006 Rod Worth Minimizer System
K/A Number:	A1.02 Ability to predict and/or monitor changes in parameters associated with operating the ROD WORTH MINIMIZER SYSTEM controls including: Status of control rod movement blocks.
K/A Value:	3.4/3.5
DAEC Objective Number:	84.00.00.05a
DAEC Objective Statement:	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: a. RPIS
Cognitive Level:	3PEO
Source:	New

Operationally Validity: Reactivity control and proper system response.

OE: Problems with RWM operations have be seen in the simulator with crews. Positions of rods have been lost due to broken sensors.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

67. **Review the indication given in the Support Material Booklet**
The plant was at Full power.
"A" RWCU Pump running with both "A and B" RWCU Beds in Service.
The "A" SBLC pump is tagged out to replace the motor.
A transient occurred resulting in an Electrical ATWS.
You have been directed to inject with SBLC.

You have placed the Handswitch (HS-2613) for SBLC in the position <u>shown in the Support Material Booklet</u> and observe the indications shown.

The following plant conditions currently exist:

- LLS is controlling RPV pressure.
- RPV level control is set at 158 inches in auto and controlling level.
- SBLC system flow indicator is indicating 0 GPM
- SBLC pump discharge pressure is indicating 1375 psig
- SBLC tank level is reading 88% and stable

What is the status of the following?
MO-2701 "RWCU Suction Outboard Isolation Valve"
MO-2740 "RWCU Return Header Outboard Isolation Valve"
"A" RWCU pump

a. MO-2701 - CLOSED
MO-2740 - OPEN
"A" RWCU pump - OFF

b. MO-2701 - OPEN
MO-2740 - CLOSED
"A" RWCU pump - ON

c. MO-2701 - OPEN
MO-2740- OPEN
"A" RWCU pump - ON

d. MO-2701 - CLOSED
MO-2740 - CLOSED
"A" RWCU pump - OFF

ANSWER: d
Answer: The indications given are of a "B" SBLC logic failure to fire the Squib valves. The effect on the RWCU system is not effected by this logic failure. The RWCU isolation will occur based on the positioning HS-2613 to the "Pumps A&B Run" position.
REFERENCE: SD 261 Rev 4 pages 10,17, 55: SD153 Rev 4 pages 45,47: OI 153 QRC Rev 0 page 1

Distracter 1:	MO-2701 will be closed and the pump off. A candidate may assume that only one side of the logic functioned leaving MO-2740 open. However, the logic is initiated by the Handswitch position and closes both valves. The pump trip will occur on MO-2701 leaving full open.
Distracter 2:	MO-2740 will go closed. A candidate may assume that only one side of the logic functioned leaving MO-2701 open. However, the logic is initiated by the Handswitch position and closes both valves. The pump trip will occur on MO-2701 leaving full open and in this case with MO-2701 open the pump would not receive a trip signal.
Distracter 3:	If the candidate incorrectly assumes the logic that closes the valves comes from the logic that controls the SQUIB valve and that is the part of the logic that failed then this would be the correct indication. However, the logic is initiated by the Handswitch position and closes both valves.
K/A System:	204000 Reactor Water Cleanup System
K/A Number:	K6.07 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER CLEANUP SYSTEM: SBLC Logic
K/A Value:	3.3/3.5
DAEC Objective Number:	11.01.01.05
DAEC Objective Statement:	List the signals that cause a RWCU pump or filter/demineralizer auto trip including setpoints and logic. Describe how they are bypassed and how they are reset
Cognitive Level:	3SPK – The candidate is presented with indications that the SBLC system has a logic failure in both SQUIB valve firing circuits and then understand that the logic that trips the RWCU has not been effected.
Source:	New
Operationally Validity:	System knowledge and interlocks.
OE:	

Estimated Completion Time: EB#_____
Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %
Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops
TMARs:
Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

68. Assuming a normal SDC alignment with the "B" RHR loop in SDC.
The "B" RHR pump is running at 4300 gpm.
The "B" RHRSW pump is running at 2000 gpm.
MO 1909 "RHR Shutdown Cooling Outboard Isolation Valve" indicates OPEN.
MO 1939 "RHR HX 1E-201B Inlet Throttle Valve" indicates DUAL.
MO 1940 "RHR HX 1E-201B Bypass Valve" indicates DUAL.
MO 1947 "RHR HX 1E-201B Service Water Outlet Isolation Valve" indicates DUAL.
The STA reports a cooldown rate of 70°F/hr.

The OSS directs you to achieve a cooldown rate between 40 and 60°F/hr.

Which of the following panel manipulation would be appropriate in achieving this order?

(Assume you place the handswitch for the indicated MO in the given direction for one second and then recalculate the cooldown rate.)

a. CLOSE on MO 1909.

b. OPEN on MO 1939.

c. OPEN on MO 1940.

d. OPEN on MO 1947.

ANSWER: c

Answer: The cooldown rate must be slowed to comply with the direction given. From the above there are two ways to achieve this. Throttle the bypass around the HX open MO 1940 to reduce flow through the HX or Throttle closed on the HX inlet MO-1939. MO 1940 is the only option given to choose from.

REFERENCE: OI 149 Rev 78 page 40

Distracter 1: Taking the HS for MO1909 to the closed position will slow the Cooldown rate because the valve will fully close and trip the Running RHR pump. The candidate must understand this is not a throttling valve. This would cause a Loss of SDC.

Distracter 2: This is a valve that is approved for controlling the cooldown rate and would be the choice if the candidate incorrectly diagnoses which way the cooldown rate needs to be adjusted. However, opening MO 1939 would increase the cooldown rate.

Distracter 3: Throttling on the RHRSW HX outlet valve on the RHRSW side is a technique used for fine temperature rate control. Procedures allow the RHRSW flow rate to be varied. However, opening this valve would cause the cooldown rate to increase, which is not the correct direction.

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

K/A Number: K1.14 Knowledge of the physical connections and/or cause-effect relationships BETWEEN SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: Reactor Temperature (moderator, vessel, flange)

K/A Value: 3.6/3.6

DAEC Objective Number: 2.01.01.01

2.01.01.02

DAEC Objective Statement:	Identify the appropriate procedures that govern the RHR system operation, include operator responsibilities during all modes of operation, and any actions required by personnel outside of the Control Room. Describe the major flowpaths and purpose for each of RHR system operation, including: c. Shutdown Cooling (SDC)
Cognitive Level:	2RI
Source:	New
Operationally Validity:	SDC control
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

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TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

69. A non-selected control rod at position 36 is uncoupled.
The RO will be selecting and WITHDRAWING this control rod fully.

Which of the following CORRECTLY describes when the uncoupled control rod can be identified using RPIS indications only?

a. As soon as the control rod is selected.

b. When the selected control rod is withdrawn from position 36 to position 38.

c. After the RMCS Timer times out with the selected control rod at position 48.

d. When the selected control rod has withdrawn past position 48 independent of the RMCS Timer.

ANSWER:	d
Answer:	The rod position will still indicate on 1C05 as the CRD mechanism is moved. If the rod were coupled the rod would not withdraw past position 48.
REFERENCE:	SD 856.1 Rev 4 page 31
Distracter 1:	A Rod Drift alarm would be received when the RMCS timer timed out and the rod was not on an even numbered position. RMCS timing out is not necessary to get the overtravel alarm.
Distracter 2:	No way to detect this failure until rod is at position 48 and a coupling check is performed.
Distracter 3:	No way to detect this failure until rod is at position 48 and a coupling check is performed.
K/A System:	214000 Rod Position Information System
K/A Number:	A3.03 Ability to monitor automatic operation of the ROD POSITION INFORMATION SYSTEM including: Verification of proper functioning/operability
K/A Value:	3.5/3.7
DAEC Objective Number:	10.01.01.04
DAEC Objective Statement:	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 that may be necessary to place the Control Rod Drive Mechanisms and Hydraulic System in the correct lineup.
Cognitive Level:	2RI
Source:	Bank - 2001 RO audit, 1999 RO NRC (minor word changes)
Operationally Validity:	Reactivity manipulation and system knowledge.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

70. Which of the following is utilized to automatically select the appropriate RBM upscale trip setpoint when the RBM is required to be in operation?

a. Steam Flow

b. Reference APRM

c. Averaging Circuit

d. Turbine 1st Stage pressure

ANSWER:	b
Answer:	The Reference APRM sends a power level to the RBM setpoint circuit which direct it to the RBM upscale trip unit.
REFERENCE:	SD 878.5 Rev 5 Pages 18 and 33.
Distracter 1:	Steam flow is used as power level indications in some systems. However, RBM does not use this signal
Distracter 2:	The averaging circuit looks at the LPRM inputs at the current power level and sends them to be monitored by RBM. However, this signal does not interface with the RBM setpoint circuit to select the upscale trip setpoint.
Distracter 3:	Turbine 1st Stage pressure is used in systems to monitor power. However, this is not an input to the RBM system.
K/A System:	215002 Rod Block Monitor System
K/A Number:	K4.02 Knowledge of ROD BLOCK MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following: Allows stepping up of rod block setpoint
K/A Value:	2.9/3.0
DAEC Objective Number:	82.00.00.02h
DAEC Objective Statement:	Describe the purpose and operation of the following principle Rod Block Monitor System components: h. RBM Setpoint Circuits
Cognitive Level:	II
Source:	New
Operationally Validity:	System knowledge and reactivity monitoring interlocks/features.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

71. The plant is at full power.
HPCI was running for a surveillance test with RHR, RHRSW, and ESW running as required for support.
Torus temperature reached the EOP 2 entry condition during the surveillance.
The OSS entered EOP 2 on Torus water temperature and Torus Cooling was MAXIMIZED with all RHR and RHRSW pumps running at rated flows.

Currently:
HPCI is secured and Torus Water temperature is 2°F above the EOP 2 entry temperature and slowly lowering.
Torus Cooling is still MAXIMIZED.

Bus 1A3 receives a bus Lockout.
Which of the following would be the expected status of Torus Cooling with no operator action?

a. "B" RHR Loop would be operating within limits.

b. The "A" RHR Loop header would be below the allowed pressure.

c. Torus Cooling would no longer be MAXIMIZED as directed by EOP 2.

d. "B" and "D" RHR pumps would be above their maximum allowed flow rates.

ANSWER:	d
Answer:	With Torus Cooling maximized and normal system lineup the RHR loops will be setup with 9600 gpm in both loops. With the loss of 1A3 the "A" loop pumps trip but the Torus Cooling inject valves are still open. The "B" loop pumps will now be in a runout condition with a flow rate of around 12,000 gpm which is well above the required 9600 gpm limit.
REFERENCE:	OI 149 Rev 78 pages 5, 28-32. SD 149 Rev 8 pages 35 and 36.
Distracter 1:	The loss of 1A3 will generate false 2 psig Drywell and 64 inch RPV water level annunciators. However, this will not cause a LPCI Loop select and LPCI initiation signal that would effect the RHR Loops as it would if it were actual signals. Torus Cooling can be restored to normal for these plant conditions. However, Torus Cooling has not been lost because the "B" side RHR pumps are running at max flow but is not within limits.
Distracter 2:	This would be possible if the loops were not cross-tied. Which the Torus inject valves both open and pumps secured the header would depressurize. However, the RHR loops are normally cross-connected and with the "B" loop in service the header will not depressurize.
Distracter 3:	Maximized is defined as all available RHR cooling not required for adequate core cooling being supplied to the Torus. Even though half of the RHR system is unavailable the direction to Maximize Torus Cooling can still be accomplished with the "B" RHR Loop.
K/A System:	219000 RHR/LPCI: Torus/Suppression Pool Cooling Mode
K/A Number:	K1.04 Knowledge of the physical connections and/or cause-effect relationships between RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE and the following: LPCI/RHR pumps
K/A Value:	3.9/3.9
DAEC Objective Number:	2.01.01.06a

DAEC Objective Statement:	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): a. Essential 4160/480 VAC electrical power supplies
Cognitive Level:	3PEO- The Candidate must recognize the effects of the loss of the essential bus on Torus cooling and realize that the "B" and "D" pumps are discharging into both loops to the Torus and this will cause the pumps to be in runout conditions.
Source:	New
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

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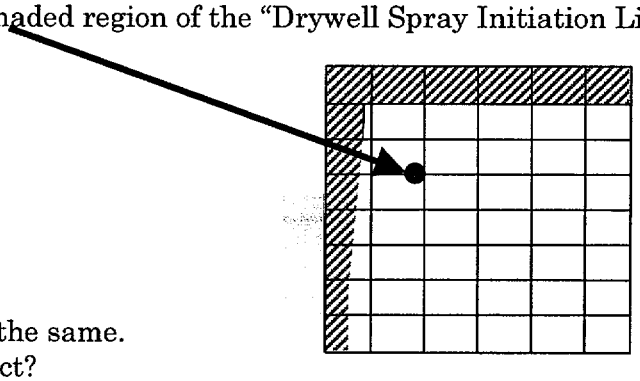
TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

72. **RO ONLY**

A plant transient has occurred resulting in High Drywell temperatures and pressures.
You are the 1C03 operator and the OSS directed you to spray the Torus and Drywell.
You initiated full Torus and Drywell sprays.
Drywell temperature and pressure lowered as expected.
Drywell pressure and temperature dropped to the point where Drywell and Torus sprays are automatically secured.
Drywell temperature and pressure again begin to rise.
Drywell pressure is currently 15 psig and Drywell temperature is 220°F.
(This point is OUTSIDE the shaded region of the "Drywell Spray Initiation Limit Graph")



All other plant conditions are the same.
Which of the following is correct?

a. With OSS permission reestablish Drywell and Torus Sprays

b. Reestablish Drywell and Torus Sprays. OSS permission is **NOT** required again.

c. Containment failure will occur if Drywell sprays are initiated at this Drywell Temperature and Pressure.

d. Drywell and Torus sprays at this temperature and pressure would result in a large amount of oxygen entering the containment through the vacuum breakers.

ANSWER: a

Answer: Containment spray is allowed at this temp. and pressure (not in the shaded region) as long as the OSS has determined we satisfy the Drywell spray curve. An operator is not allowed by procedure (EOP 2 Guidelines) to reestablish containment sprays without OSS permission due to the impact this could have on Primary Containment.

REFERENCE: EOP 2 Rev 9, EOP 2 Bases Rev 6 pages 43-46 and 66-67.

Distracter 1: Containment spray is allowed at this temp. and pressure (not in the shaded region). However, An operator is never allowed to reestablish containment sprays without OSS permission. This could cause containment failure if the Drywell spray curve is not satisfied.

Distracter 2: Most of the EOP curves require action upon entering the shaded regions of the curves. However, the Drywell spray curve prohibits action when in the shaded region. Sprays would be allowed in this region. Containment failure is one reason for the curve.

Distracter 3: Most of the EOP curves require action upon entering the shaded regions of the curves. However, the Drywell spray curve prohibits action when in the shaded region. Sprays would be allowed in this region. O_2 introduction is a reason for the curve.

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

K/A Number:	A2.17 Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY MODE; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment/drywell temperature.
K/A Value:	3.2/3.2
DAEC Objective Number:	2.06.01.12
DAEC Objective Statement:	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:	3PEO – The candidate must determine from the indications given that DW sprays have again become required based on DW temperature and pressure. They must also determine based on the graph given that sprays can be initiated but procedurally they must again receiving OSS permission.
Source:	New
Operationally Validity:	EOP actions and containment integrity.
OE:	Operators in simulator scenarios have mistakenly re-established sprays without OSS authorization. This could lead to containment failure under certain conditions.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

73. **RO ONLY**

A small break LOCA has occurred from full power.
Drywell Pressure is 2.4 psig and stable.
Torus water level is 12.5 ft.
RPV level is 214 inches and stable

Which condition below, BY ITSELF, will cause Torus Water level to continue to rise if no operator action is taken?

(Consider each condition independently and assume all automatic actions occur as required)

a. The "A" loop RHR pumps are injecting into the RPV for Level control and the "B" loop RHR pumps are lined up for Torus Spray.

b. All RHRSW pumps are running and spraying the Torus per AIP 401"Injection with RHRSW".

c. Both Core Spray pumps AUTOMATICALLY started on Drywell pressure and are injecting.

d. HPCI Started automatically started on the High Drywell pressure signal.

ANSWER:	b
Answer:	RHRSW injects from external to the containment. Torus water level will increase in containment unless a drain path is provided.
REFERENCE:	SD 149 Rev 8 page 45. SD 416 Rev 4 page 27. AIP 401 Rev 44 pages 1-3.
Distracter 1:	RHR is maintaining level in the RPV and there is a LOCA which will allow water to drain to the Torus. However, RHR takes a suction from the Torus so the net gain in Torus water level is zero. This is a common mistake by inexperienced operator. RPV level shows a level increase with LPCI injection but total water inventory is the same.
Distracter 2:	Core Spray can be lined up to external sources of water and could increase water inventory in the containment. However, the normal lineup is to the Torus and the net gain in water level is zero.
Distracter 3:	HPCI would have started on the high drywell pressure signal and would add inventory to the Torus. However, it currently has an RPV high level trip signal in that prevents it from running.
K/A System:	230000 RHR/LPCI: Torus/Pool Spray Mode
K/A Number:	A1.06 Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/POOL SPRAY MODE controls including: Suppression pool level.
K/A Value:	3.3/3.3
DAEC Objective Number:	2.01.01.02i
DAEC Objective Statement:	Describe the major flowpaths and purpose for each of RHR system operation, including: i. Reactor or Containment Flood with RHRSW
Cognitive Level:	3SPK
Source:	New
Operationally Validity:	EOP support procedure knowledge and system knowledge.

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

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TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

74. **RO ONLY**

The plant is at full power.
You are cycling MO-1904 "Outboard Inject Isolation Valve" for the "B" RHR loop for post maintenance testing.
When you take the handswitch to OPEN annunciator 1C08A D-5 "MCC 1B34A/1B44A Tie Breaker 1B3402 or 1B4402 Trip" is received.
You notice the valve indicating lights for MO-1904 and MO-1905 "Inboard Inject Isolation Valve" are OFF.

Which of the following would be the expected condition of the Recirc system Valves? (Assume no operator actions)

a. The "A" and "B" Recirc Pump Suction, Discharge, and Discharge Bypass Valves have lost power.

b. The "A" and "B" Recirc Pump Discharge and Discharge Bypass Valves have lost power. The Suction Valves are still powered.

c. The "B" Recirc Pump Suction, Discharge, and Discharge Bypass Valves have lost power. The "A" Recirc Pump Valves are still powered.

d. The "B" Recirc Pump Discharge and Discharge Bypass Valves have lost power; the Suction Valve is still powered. The "A" Recirc Pump Valves are also still powered.

ANSWER:	a
Answer:	With the loss of power to MO-1904 and 1905 and the alarm on 1C08A, this would indicate the LPCI swing bus has lost power. This will cause the loss of the "A" and "B" Recirc Pump Suction, Discharge, and Discharge Bypass Valves and MO2003 and 2004 for the "A" side of RHR.
REFERENCE:	1C08A D-6 Rev 5 page 1 and 2. SD 149 Rev 8 page 20
Distracter 1:	The "A" and "B" Recirc Pump Valves do lose power. However, the suction valves also lose power. These valves do not receive a closed signal during a LPCI initiation as do the Discharge and Discharge Bypass valves but they are powered from the LPCI swing bus.
Distracter 2:	The "B" Recirc Pump Valves do lose power. However, the "A: side also loses power.
Distracter 3:	The "B" Recirc Pump Valves do lose power. However, the "A: side also loses power and the "B" side suction valve loses power.
K/A System:	202001 Recirculation System
K/A Number:	K2.03 Knowledge of the electrical power supplies to the following: Recirculation System valves
K/A Value:	2.7/2.83
DAEC Objective Number:	NSPEO - 35.00.00.02
DAEC Objective Statement:	Identify power supplies for the Recirculation system components.
Cognitive Level:	1F
Source:	New
Operationally Validity:	ECCS system power and knowledge.
OE:	The LPCI swing bus has resulted in events here at DAEC.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

75. **Review the indication given in the Support Material Booklet**
RO ONLY

Preparations for placing the Main Generator on the grid are in progress.
Currently generator voltage is 20,000 volts.
You are to adjust generator voltage to the proper voltage for placing the generator on the grid.
(Proper voltage regulator response has already been verified)

Which is the proper switch and manipulation that would adjust Generator voltage to the correct voltage for placing the Generator on the grid?

Adjust the (GENERATOR AUTOMATIC VOLTAGE ADJUST SWITCH / GENERATOR MANUAL VOLTAGE ADJUST SWITCH) in the (RAISE/LOWER) direction until voltage is at the desired voltage.

a. GENERATOR MANUAL VOLTAGE ADJUST SWITCH ; RAISE

b. GENERATOR MANUAL VOLTAGE ADJUST SWITCH ; LOWER

c. GENERATOR AUTOMATIC VOLTAGE ADJUST SWITCH ; RAISE

d. GENERATOR AUTOMATIC VOLTAGE ADJUST SWITCH ; LOWER

ANSWER:	a
Answer:	The voltage regulator is in manual and to change the generator voltage the manual voltage adjust switch will have to be taken to raise to increase voltage. The candidate has to realize we are in manual and then determine you have to go to raise voltage to get to the desired voltage.
REFERENCE:	OI 698 Rev 39 pages 4 and 11
Distracter 1:	The candidate may think voltage is too high and adjust the voltage in the wrong direction on the manual controller, which is the correct controller, but the wrong direction.
Distracter 2:	If the candidate does not realize the manual mode is in service the automatic voltage regulator may be chosen. However, the indications are for manual mode of voltage control.
Distracter 3:	If the candidate does not realize the manual mode is in service the automatic voltage regulator may be chosen. However, the indications are for manual mode of voltage control.
K/A System:	245000 Main Turbine Generator and Auxiliary Systems
K/A Number:	A4.12 Ability to manually operate and/or monitor in the control room: Generator output voltage
K/A Value:	2.6/2.6
DAEC Objective Number:	57.00.00.02 57.02.01.04e/f

DAEC Objective Statement:	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 Describe the operation of the following principle Main Generator System components: e. AC (Automatic) Regulator f. DC (Manual) Regulator
Cognitive Level:	3SPK
Source:	New
Operationally Validity:	Understanding of Generator controls and setpoints for voltage.
OE:	Placing the Generator on the grid has challenged operators in the simulator.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

76. **RO ONLY**

The plant is currently at full power.
1C06A D-12 "Condensate Pumps 1P-8A/B LO Discharge Pressure" annunciator alarms.
1P-8B "B Condensate Pump" amperage is reading 20% of 1P-8A "A Condensate Pump" amps.

Which of the following would explain these indications and actions to be taken?

a. The "B" Feed Reg Valve is failing closed. Insert a manual SCRAM.

b. The "A" Feed Reg Valve is failing open. Monitor RPV water level, a SCRAM would **not** be expected.

c. 1P-8B motor has become uncoupled from the pump. Insert a manual SCRAM.

d. 1P-8B motor has become uncoupled from the pump. Monitor RPV water level, a SCRAM would **not** be expected.

ANSWER:	c
Answer:	Lowering amp and the associated low-pressure alarm indicates the pump is not putting out the desired pressure. The pressure alarm is received at 250 psig and the feed pumps will tip at 225 psig after a 5-second (1P-8A) and 10 second (1P-8B) time delay. At full power a scram will be required.
REFERENCE:	ARP 1C06A D-12 Rev 4, SD 644 Rev 5
Distracter 1:	A scram is required. The "B" FRV closing would affect the "B" RFP in this way. However, this does not affect the "B" Condensate pump because the Condensate pumps combine to a common header. If anything both "A" and "B" pump amps would change in the same direction.
Distracter 2:	The "A" FRV opening would affect the "A" RFP in this way. However, this does not affect the "A" Condensate pump because the Condensate pump combine to a common header. If any thing both "A" and "B" pump amps would change in the same direction.
Distracter 3:	The "B" Condensate pump becoming uncoupled would give these indications. Level will not be controllable because the "A" RFP will trip 5 seconds after pressure reached 225 psig. At this power RPV level will not be able to be maintained.
K/A System:	256000 Reactor Condensate System
K/A Number:	A3.05 Ability to monitor automatic operation of the REACTOR CONDENSATE SYSTEM including: Lights and alarms.
K/A Value:	3.0/3.0
DAEC Objective Number:	99.08.01.06
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the Feed and Condensate System is operating as expected, and identify any actions that may be necessary to place the Feed and Condensate System in the correct lineup.
Cognitive Level:	2RI
Source:	New
Operationally Validity:	System knowledge and alarm response. Condensate and Feedwater system transients have occurred at DAEC. Also Pump amp readings were a key indicator on a Circ Water pump event where the pump bowl fell off resulting in a reactor scram.

OE: Motors and pumps have uncoupled. The operator should understand these indications and the expected plant response. LER 91-011-00 PWR Condensate pump shaft shear event at H.B. Robins Unit 2 resulting in a scram.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

77. A trainee is synchronizing 1G 31 "A SBDG" to the 1A3 bus.
The following conditions are present during synchronizing the SBDG:

- The incoming voltage is slightly HIGHER than running voltage.
- The synchroscope is rotating slowly in the clockwise direction.

The trainee places the "A" SBDG output breaker to the close position when the synchroscope is at the 3 o'clock position.

Which of the following describes the expected breaker response?

The "A" SBDG output breaker will ...

a. close and then trip open due to "A" SBDG overspeed trip.

b. close and then trip open due to an instantaneous overcurrent trip.

c. remain open due to the sync-check relay sensing excessive current differential.

d. remain open due to the sync-check relay sensing excessive incoming to running phase angle differential.

ANSWER:	d
Answer:	The sync-check relay prevents closing in the SBDG output breaker if too large a phase difference is sensed. This protects the electrical plant from inadvertent paralleling of power sources that are not synchronized and the resulting damage that could occur.
REFERENCE:	OI 324 Rev 55 Pages 17 and 18.
Distracter 1:	The SBDG could possibly over speed if the breaker closed in but this is unlikely. The breaker will not try to close due to the sync-check relay action.
Distracter 2:	There could be an instantaneous overcurrent condition due to the large phase difference if the breaker were to close. The breaker will not try to close due to the sync-check relay action.
Distracter 3:	The breaker will remain open. However, it is not due to the excessive current differential.
K/A System:	262001 A.C. Electrical Distribution
K/A Number:	A4.05 Ability to manually operate and/or monitor in the control room: Voltage, current, power, and frequency on A.C. buses.
K/A Value:	3.3/3.3
DAEC Objective Number:	19.00.00.03
DAEC Objective Statement:	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:	3PEO – The candidate will have to predict the expected plant response due to the positioning of the SBDG output breaker at the incorrect time.
Source:	Bank – Lasalle 2000 NRC Exam
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

78. Of the systems listed below which one meets the requirements needed for the following situation?

The plant is installing a new component.
The component is **NOT** safety related or essential to plant safety.
However, power interruptions to this component should be avoided.
The plant power supply to the component must have 3 power sources, one normal source and two alternate sources.
Upon loss of power to the normal power supply the system must be able to AUTOMATICALLY align to either of the two alternate sources WITHOUT prolonged loss of power (less than 2 seconds).

a. The 125 VDC Power Supply System
b. The Instrument A.C. Control System.
c. The Uninterruptible A.C. Control Power System.
d. Reactor Protection System Distribution Panel 1Y30

ANSWER:	c
Answer:	This is the purpose of Uninterruptible AC. The candidate must understand the purpose of the system and understand how the purpose is achieved. Many electrical systems at DEAC have multiple power sources. However, the Uninterruptible system is unique in the fact that there are two alternate sources which will quickly supply power to the bus automatically with a minimal delay in restoring bus power.
REFERENCE:	SD 357 Rev 5 page 4
Distracter 1:	125 VDC does not have three power sources and there are none safety-related components on this bus. The essential bus, which supplies 125 VDC, does have 3 sources but if the SBDG transfers to the buss it will take longer than 2 seconds.
Distracter 2:	Instrument AC has three power sources and there are none safety-related components on this bus. However, it only automatically switches between 2
Distracter 3:	RPS has two sources and no automatic switching. The essential bus, which supplies RPS, does have 3 sources but if the SBDG transfers RPS will trip and have to be manually recovered.
K/A System:	262002 Uninterruptible Power Supply (A.C./D.C)
K/A Number:	2.1.27 Knowledge of system purpose and/or function.
K/A Value:	2.8/2.9
DAEC Objective Number:	21.00.00.01
DAEC Objective Statement:	State the purpose of the Uninterruptible AC system
Cognitive Level:	2RW
Source:	New
Operationally Validity:	System purpose.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

79. The plant is at power.
Annunciator 1C35A "Offgas Stack KAMAN 9 & 10 HI RAD or Monitor Trouble" alarms.
Offgas Stack flow has not changed.
The Chemist reports the Normal Range sample pump is not working.
All other Offgas Stack KAMAN equipment is functional.

Which of the following is correct?

a. The KAMAN Normal Range is INOPERABLE. The Accident Range is OPERABLE.

b. The KAMAN Normal Range is OPERABLE. The Accident Range is INOPERABLE.

c. Both KAMAN Normal and Accident Ranges are INOPERABLE.

d. Both KAMAN Normal and Accident Ranges are OPERABLE.

ANSWER: c

Answer: The KAMAN has to be running to allow the Accident Range Sample pump to function properly. The Normal Range Sample Pump uses an isokinetic probe to sample process flow and the Accident Range Sample pump uses an isokinetic probe to sample the flow going to the Normal Range Monitors. If Normal Sample flow stops the Accident Range Sample will not be an accurate sampling.

REFERENCE: SD 879.3 Rev 5 pages 12 and 29.

Distracter 1: The candidate may assume that because the Accident Range Sample pump is functional this will allow the Accident Range Monitor to still be operable. However, the Accident Range Sample pump depends on the Normal Range Sample pump for sample flow.

Distracter 2: The candidate may assume because Offgas has flow the isokinetic probe will still have flow to the Normal Range monitor but the Accident Range Monitor would be inaccurate.

Distracter 3: The candidate may assume because Offgas has flow the isokinetic probe will still have flow to the Normal Range monitor and the Accident Range Monitor still has a pump available for sampling.

K/A System: 272000 Radiation Monitoring System

K/A Number: K3.02 Knowledge of the effect that a loss or malfunction of the RADIATION MONITORING System will have on the following: Station gaseous effluent release monitoring.

K/A Value: 3.2/3.8

DAEC Objective Number: 87.00.00.02a/b

87.00.00.04

DAEC Objective Statement: Describe the operation of the following principle KAMAN System components:
a. Accident Range Monitor
b. Normal Range Monitor

State when the KAMAN System is required to be operable by Technical Specifications and describe the bases of the KAMAN System LCOs

Cognitive Level: 2DR – The candidate must recognize the relationship and interdependence of the Accident Range Monitor on the Normal Range Monitor and understand how the isokinetic probe functions.

Source: New

Operationally Validity: System knowledge.

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

80. During shiftly annunciator checks the annunciators do not alarm on panel 1C40 "Fire Protection".
AOP 302.2 " Loss of Alarm Power" is entered.
There are NO other annunciators in alarm.

Which of the following panels has the breaker that supplies power to 1C40 and would give these indications if the breaker had tripped open?

a. 1D13

b. 1D50

c. 1Y11

d. 1Y23

ANSWER: a
Answer: 1D13 ckt 6 125 VDC Div 1 is the power supply to 1C40. This is one of the fire detection systems major annunciator panels. The loss of this panel would require several fire watches covering most of the plant areas.
REFERENCE: AOP 302.2 Rev 11 page 3 and 38. OI 302 attachment 3 Rev 0 page 7
Distracter 1: This is Div 1 of 24 VDC. Alarm power comes from 125 VDC.
Distracter 2: 1Y11 supplies power to many components in the control room but no alarm power.
Distracter 3: 1Y23 supplies power to many components in the control room but no alarm power.
K/A System: 286000 Fire Protection System
K/A Number: K2.03 Knowledge of electrical power supplies to the following: Fire detection system.
K/A Value: 2.5/2.7
DAEC Objective Number: NSPEO 9.00.00.02
DAEC Objective Statement: Identify power supplies for the Fire Protection system components
Cognitive Level: 1F
Source: New
Operationally Validity: AOP actions and annunciator power supplies.
OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

81. **RO ONLY**

The plant is at 85% power.
During movement of a large component on the Refuel floor the component contacted the outside wall and opened a large hole in the wall to atmosphere.
The Reactor Building Supply fans are all OFF.
The Reactor Building to Atmosphere DP has stabilized at 0.1 inches of water with the Reactor Building Exhaust Fans EF 1, 2, and 3 running.
HPs report there are NO abnormal radiation level readings.

Which ONE of the following states the adverse consequences that has/will occur in this situation and what procedure directs the actions for this event?

a. Refuel Floor integrity has been lost to atmosphere with spent fuel in the Fuel Pool. EOP 4 is entered to prevent Radioactive release to the environment.

b. In the event of a design basis Loss of Coolant Accident (LOCA) an unmonitored release could occur. T.S. directs actions for secondary containment operability.

c. The Drywell pressure instrumentation is inoperable. ARP 1C23C A-6 "Main Plant Exhaust Plenum HI Pressure" directs re-calibration of the Drywell pressure instruments.

d. The differential pressure across the Reactor Building doors will prevent access to the Secondary Containment. EOP 3 is entered on loss of Secondary Containment access.

ANSWER:	b
Answer:	These conditions indicate a large break in secondary containment. If a LOCA occurs a path could allow leakage from the RB to atmosphere. T.S. require re-establishment of secondary containment within 4 hours.
REFERENCE:	Tech. Spec. 3.6.1.4. ARP 1C23A Rev 6, SD 170.1 Rev 3 page 4
Distracter 1:	The refuel floor and secondary containment is lost. However, there is no EOP 4 entry level condition at this point.
Distracter 2:	With a change in Reactor Building pressure the Drywell pressure instruments will be slightly affected. However, there are no T.S. requirements to re-calibrate and ARP 1C23C A-6 has no provision for this.
Distracter 3:	The DP will change across the doors and with 3 exhaust fans running it would normally be hard to open the air lock doors. However, with a .1 in water dP the doors would actually be easier to open and there is no entry condition for EOP 3.
K/A System:	290001 Secondary Containment
K/A Number:	A2.02 Ability to (a) predict the impacts of the following on the SECONDARY CONTAINMENT; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Excessive outleakage.
K/A Value:	3.5/3.7
DAEC Objective Number:	67.00.00.02a 67.01.01.01

DAEC Objective Statement:	State the Technical Specification operability requirements for: a. Secondary containment integrity Relate the precautions and limitations, operating cautions, or procedural notes of OI-734 to any component or operating status of the Reactor Building HVAC system
Cognitive Level:	2RI – The candidate must recognize the implications between secondary containment and DBA LOCA conditions and understand the T.S. requirements for secondary containment.
Source:	New
Operationally Validity:	Secondary Containment integrity.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

82. **RO ONLY**

The Plant was at full power.
A complete Loss of Off Site Power (LOOP) has occurred.
Torus cooling has been maximized.
The Control Building Chillers were off for an extended time.
Control Room temperature reached 95°F.
1V-CH-1A "A Control Building Chiller" was started and is currently running.
Control Room temperature is lowering.

Which of the following is correct concerning the Temperature Load Control (TLC) units of the "A" Control Building Chiller under the current plant conditions?

a. The 75 Hp TLC is controlling until the "A" or "B" RHR pump is secured.

b. The 75 Hp TLC is controlling until the Essential Bus is powered from either the Startup or Standby Transformers.

c. The 200 Hp TLC is controlling until Control Room temperature reaches 90°F.

d. The 200 Hp TLC is controlling until the local keylock switch, HS-6924X "Reduced Loading Control ", is placed in the 75 Hp position.

ANSWER: b

Answer: The Temperature Load Control unit for the chiller will automatically shift to the 75Hp TLC on loss of Off Site power due to the S/U and S/B transformer breakers opening to the essential bus. The TLC will not shift back until power is restored to the bus through one of these breakers.

REFERENCE: SD 730 Rev 4 page15.

Distracter 1: With Torus Cooling maximized the Essential Bus is heavily loaded and securing one RHR pump would significantly reduce the load on the bus and possible allow placing the 200 Hp TLC in service. However, bus loading detection is not in the selection circuit for the TLC that is in control.

Distracter 2: With high CR temperatures the chiller will be loaded more and the 200 Hp setting would allow temperature to be reduced faster. However, under these conditions the 200 Hp controlled is automatically deselected.

Distracter 3: There is a local keylock HS-6924X "Reduced Loading Control Switch" which can be selected to the 75 Hp position and a caution in OI 730 directs its use for reducing loads on the bus. However, the TLC has already selected the 75 Hp TLC due to the LOOP.

Note: This was a misconception in the past when it was thought that the chiller could only be shifted manually to 75 Hp TLC by using the local HS.

K/A System: 290003 Control Room HVAC

K/A Number: K5.03 Knowledge of the operational implication of the following concepts as they apply to CONTROL ROOM HVAC: Temperature control

K/A Value: 2.6/2.7

DAEC Objective Number: 65.00.00.02a

DAEC Objective Statement: Describe the operation of the following principle Control Building HVAC System components, during normal and off-normal conditions:
a. Control Building Chillers

Cognitive Level: 2RI
Source: New
Operationally Validity: Essential Bus loading and system operations during a LOOP
OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

83. **RO ONLY**
AOP 518 "Failure of Instrument and Service Air" was entered due to a large air line break at the Instrument Air Dryers.

Which of the following indications would **NOT** be expected under these conditions?

a. 1C05A E-3 "SBLC Tank HI/LO Level" with level reading 95%.

b. 1C07B B-9 "Air Compressor Facility Trouble" with all compressors running.

c. 1C05B F-1 "SCRAM Air Header HI/LO Pressure" with pressure reading 60 psig.

d. 1C06A D-1 and 2 "A and B RHRSW/ESW Pit Low" with CV-4914 and 4915 "River Water Supply" makeup valves full open.

ANSWER: a

Answer: This alarm is a probable indication given for entry into AOP 518. The SBLC annunciator will come in on a loss of air. The level indicator is a bubblier type and on a loss of air pressure the detector will indicate lower than actual tank level. This indicator causes confusion at times because the tube will plug and the tank level will show a slow rise in level. This is not due to a loss of air flow but to a build up of pressure on the indicating side.

REFERENCE: AOP 518 Rev 22 pages 7 and 8. 1C05A E-3 Rev 2 page 1 and 2.

Distracter 1: This alarm is a probable indication given for entry into AOP 518. Under these conditions all three compressors should be running. The alarm is due to the low air pressure condition. There are compressor trips that come in on this alarm.

Distracter 2: This alarm is a probable indication given for entry into AOP 518. The SCRAM air header will be in at 67 psig. The candidate will have to know the air pressure is low to determine if this is an indication for AOP 518 entry.

Distracter 3: This alarm is a probable indication given for entry into AOP 518. The low pit level is due to a loss of air to the bubblier to the pit level detectors. Pit level will actually be high. Max RWS flow is the fail-safe mode of RWS valves. The candidate will have to understand both of these conditions are consistent with a loss of air.

K/A System: 300000 Instrument Air System

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

K/A Value: 4.0/4.3

DAEC Objective Number: 94.17.01.06

DAEC Objective Statement: Evaluate plant conditions to determine if entry into AOP 518 is warranted

Cognitive Level: 2RI

Source: NEW

Operationally Validity: AOP entry conditions and system response.

OE: Loss of Instrument Air is an industry and DAEC event.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

84. The Traversing In-core Probe System was in service when a Group 2 Containment Isolation signal is received.
One probe does **NOT** automatically retract.
The key lock switch on the TIP Valve Control Monitor has been placed to the FIRE position.

Which of the below correctly describes the control room indication(s) of this condition?

a. The SHEAR VLV MONITOR light is OFF.

b. The GROUP 2 ISOLATION light is OFF.

c. The BALL VALVE CLOSED light is ON.

d. The SQUIB MONITOR light is ON.

ANSWER:	d
Answer:	After firing the squib valves the light on will indicate a successful actuation.
REFERENCE:	SD 878.6 Rev 5 pages 26 and 27, OI 878.6 Rev 23 pages 17 and 18.
Distracter 1:	After firing the squib valves the Shear Valve Monitor light is ON, indicating a successful actuation. This is a common misconception opposite of the SBLC system.
Distracter 2:	The Group 2 isolation light will be ON. However, the group 2 completed light will be OFF.
Distracter 3:	The Ball valve will be open and the open light on. The shear valve is upstream of the valve and the TIP cable will not be able to be withdrawn after it is sheared. This is a common misconception.
K/A System:	215001 Traversing In-Core Probe
K/A Number:	A3.03 Ability to monitor automatic operations of the TRAVERSING IN-CORE PROBE including: Valve operation.
K/A Value:	2.5/2.6
DAEC Objective Number:	83.01.01.07 83.03.01.05
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the TIP System is operating as expected, and identify any actions that may be necessary to place the TIP System in the correct lineup. Describe how the TIP System responds to a group 2 PCIS isolation signal, include how to reset the TIP System
Cognitive Level:	1I
Source:	Bank – 1998 NRC
Operationally Validity: OE:	Automatic actions required for PCIS and the action did not occur. The operator is responsible to complete the action and verify the correct system response.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

85. **RO ONLY**

The Fuel Pool water temperature in the FUEL POOL should not exceed what temperature when there is irradiated fuel in the pool?
If the Fuel Pool water temperature needs to be lowered the operator can throttle OPEN which flow from the Fuel Pool Heat Exchanger?

a. 130°F, GSW

b. 130°F, RBCCW

c. 150°F, GSW

d. 150°F, RBCCW

ANSWER:	d
Answer:	RBCCW cools the Fuel pool heat exchanger and pool temperature should be <150°F. This is described in the FP system description and is a caution in the OI.
REFERENCE:	OI 435, Rev. 32 pages 8, 9 and 11; SD 435 Rev 4, page 11.
Distracter 1:	GSW cools the RBCCW HX which then cools the FP HX. The 130°F is the temperature out of FP HX for resin protection.
Distracter 2:	The 130°F is the temperature out of FP HX for resin protection. The RBCCW is the correct cooling water source.
Distracter 3:	150°F is the correct temperature. However, GSW cool the RBCCW HX which then cools the FP HX.
K/A System:	233000 Fuel Pool Cooling and Cleanup
K/A Number:	K4.03 Knowledge of FUEL POOL COOLING AND CLEANUP design feature(s) and/or interlocks, which provide for the following: Maintenance of adequate pool temperature.
K/A Value:	2.8/3.1
DAEC Objective Number:	31.00.00.09
DAEC Objective Statement:	Explain the function of the following FPC System components: c. Fuel Pool Heat Exchangers
Cognitive Level:	1I
Source:	Bank – significantly changed
Operationally Validity:	System cautions and fuel cooling.
OE:	There has been mis-operation of the FPC system at DAEC.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

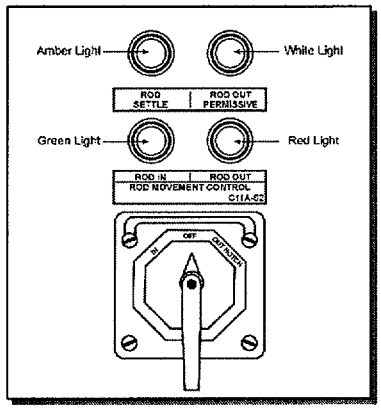
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

86. **RO ONLY**
At which point in the following Core Alteration scenario would the "Rod Out Permissive" white light above the RMCS "Rod Movement Control" switch FIRST go OUT?



Scenario:

- The Mode Switch is in REFUEL.
- All control rods are fully inserted.
- One control Rod is selected.
- The "Rod Out Permissive" white light is ON.
- The only hoist in use is the Main Grapple Hoist.
- A fuel assembly is grappled and raised to Full-Up in the Fuel Pool.
- The Refuel Platform is driven over the core.
- The fuel assembly is lowered into its assigned location.
- The 1C05 operator attempts to withdraw the selected control rod.

The "Rod Out Permissive" white light will FIRST go OUT when ...

a. the loaded Main Grapple Hoist reaches Full-Up in the Fuel Pool.
b. the Refuel Platform is driven over the core.
c. the Main Grapple Hoist starts to lower the fuel assembly.
d. the 1C05 operator attempts to withdraw the selected control rod.

ANSWER:	b
Answer:	With the Grapple not showing closed and the hoist loaded and no slack cable this indicates the bundle is being lifted but is not properly grappled.
REFERENCE:	SD 281 Rev 3 Page 7-10.
Distracter 1:	Bridge over the core with hoist loaded is a Rod Block. No Rod Block until then.
Distracter 2:	Bridge over the core with hoist loaded is a Rod Block.
Distracter 3:	Bridge over the core with hoist loaded is a Rod Block
K/A System:	234000 Fuel Handling Equipment
K/A Number:	K1.04 Knowledge of the physical connections and/or cause/effect relationships between FUEL HANDLING EQUIPMENT and the following: Reactor Manual Control System.
K/A Value:	3.3/3.6
DAEC Objective Number:	72.00.00.02f 72.02.01.06

DAEC Objective Statement: Describe the operation of the following principle Reactor Manual Control System components:
f. Refueling interlock relays.

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

Cognitive Level: 2RI
Source: New

Operationally Validity:
OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

87. During vessel re-assembly the Head Bolts for the Steam Separator and Shroud Head Assembly were **NOT** tightened.

Which of the following indications would operators see?

a. The Reactor will go critical several rods early.

b. Recirc Pump flow mismatch will be greater at high power.

c. At higher Recirc flow rates as flow is increased power will **NOT** increase as expected.

d. The GEMAC Level instruments will start to deviate from each other until they are no longer within tolerance allowed by the TRM.

ANSWER:	c
Answer:	This is an industry event from Dresden 3 1991. The operators observed these indications at 88% power when raising Recirc flow.
REFERENCE:	Event 249-910324-1 02/24/1991 Dresden unit 3.
Distracter 1:	Pressure in the core region may be marginally affected. However, this would have little or no effect on when criticality occurs.
Distracter 2:	Recirc flow may be effected at higher power but the mismatch under these conditions will be controlled by the operators and not effected by the event.
Distracter 3:	The GEMAC level instruments would possibly be affected when the shroud head lifts. However, all the instruments will be affected equally.
K/A System:	290002 Reactor Vessel Internals
K/A Number:	K3.03 Knowledge of the effect that a loss or malfunction of the REACTOR VESSEL INTERNALS will have on the following: Reactor power.
K/A Value:	3.3/3.4
DAEC Objective Number:	12.00.00.04 12.00.00.05 12.03.01.10
DAEC Objective Statement:	Evaluate plant conditions and control room indications to determine if the Recirc system is operating as expected, and identify any actions that may be necessary to place the Recirc system in the correct lineup Identify the applicability of, and explain the significance of, any given SOER or Industry Event to the Recirc system State the parameters that must be monitored during power changes
Cognitive Level:	3PEO
Source:	New
Operationally Validity:	Reactivity monitoring and vessel internal failure indications.
OE:	Event 249-910324-1 02/24/1991 Dresden unit 3.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

88. **Review the indication given in the Support Material Booklet**
The plant is at power.
The "B" Recirc MG Set Scoop tube is locked.
You are directed to take Local control of the "B" Recirc MG Set Scoop tube.
Review the Picture on the following page.

From the labeled components choose which one performs each of the following functions?
1) Deenergizes the brake.
2) Mechanically releases brake tension to allow manual turning of the hand crank.
3) Proper Hand Crank location when adjusting scoop tube position.

a. 1) B
2) A
3) D

b. 1) B
2) F
3) D

c. 1) C
2) A
3) E

d. 1) C
2) F
3) E

ANSWER:	a
Answer:	The locations indicated are the correct location to perform the indicated function.
REFERENCE:	OI 264 Rev 70 page 33 and 34.
Distracter 1:	B and D are correct. F is not correct per procedure and it will not perform the intended function.
Distracter 2:	A is correct. E would function to control the scoop tube but is not the designated place for installation of the hand crank. C is not correct and would not perform the intended function.
Distracter 3:	E would function to control the scoop tube but is not the designated place for installation of the hand crank. C and F are not correct and would not perform the intended functions.
K/A System:	Generic
K/A Number:	2.1.30 Ability to locate and operate components / including local controls.
K/A Value:	3.9/3.4
DAEC Objective Number:	12.02 12.01.01.01
DAEC Objective Statement:	Adjust Speed controls from MG Set Room Identify the appropriate procedures that govern the Recirc system operation, include operator responsibilities during all modes of operation, and any actions required by personnel outside of the Control Room
Cognitive Level:	1F

Source: New

Operationally Validity: This is a reactivity manipulation performed out side the control room and would only be performed by a Licensed operator during power operations.

OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

89. **RO ONLY**
What is the MAXIMUM loadline allowed by IPOI-3, "Power Operations"?

a. 100.6%

b. 100.8%

c. 106%

d. 108%

ANSWER:	a
Answer:	This is a recent change but 100.6% is the current load line limit.
REFERENCE:	IPOI 3 Rev 54 pages 4 and 17
Distracter 1:	Similar and a value discussed during power uprate.
Distracter 2:	Similar to both the old value and the current value.
Distracter 3:	This is the old value.
K/A System:	Generic
K/A Number:	2.1.32 Ability to explain and apply system limits and precautions.
K/A Value:	3.4/3.8
DAEC Objective Number:	93.10.01.01 93.10.01.02c 93.15.01.04
DAEC Objective Statement:	Explain the bases for the precautions and limitations of IPOI 3 Concerning the power to flow map, determine the following: c. operational restrictions imposed by the power to flow map Define the term 'load line' and explain how it is determined
Cognitive Level:	1P
Source:	Bank – 2001 ILC Practice Audit (modified)
Operationally Validity:	Reactor power requirements.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

90. **RO ONLY**
Which of the following plant conditions would require entry into the LCO for Recirc pump speed mismatch?

	Rated Thermal Power	"A" Recirc speed	"B" Recirc speed
a.	55%	60%	75%
b.	65%	75%	90%
c.	75%	60%	75%
d.	85%	75%	90%

ANSWER: c
Answer: P&L 15 from OI 264 and Tech Spec SR3.4.1.1 requires with power ≥69.4% RTP the speed of the faster pump shall be ≤122% of the speed of the slower pump.
REFERENCE: OI 264 Rev 69 page 6. TS 3.4.1 LCO Amendment 223 page 3.4-1
Distracter 1: This is within TS allowances. = 1.25% which is <1.35% mismatch allowed
Distracter 2: This is within TS allowances. = 1.20% which is <1.35% mismatch allowed
Distracter 3: This is within TS allowances. = 1.20% which is <1.22% mismatch allowed
K/A System: Generic
K/A Number: 2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.
K/A Value: 3.4/4.0
DAEC Objective Number: 12.00.00.06

12.01.01.02
DAEC Objective Statement: Identify the Technical Specifications LCOs associated with the Recirculation system

Relate the precautions and limitations, operating cautions, or procedural notes of OI-264, Reactor Recirculation system and any applicable ARP, to any component or Recirc system operating status.
Cognitive Level: 1I
Source: New
Operationally Validity: Tech Spec checked on dailies and Recirc P&L which effects LPCI loop select logic.
OE:

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____
Operator Validated By: _____ _____ _____ _____
Approved By: _____ Date: _____ _____ Date: _____
Operations Manager Trng Supervisor-Ops

TMARs:
Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

91. **RO ONLY**

The plant is 50% power.

The "A" Recirc pump is secured.

Which of the following is the lowest MCPR can reach and NOT violate the T.S. MCPR safety limit when operating in this condition?

a. MCPR at 1.07

b. MCPR at 1.10

c. MCPR at 1.12

d. MCPR at 1.14

ANSWER:	c
Answer:	Current value for MCPR Safety Limit
REFERENCE:	Tech Spec Amendment 243 page 2.0-1
Distracter 1:	Old TS number
Distracter 2:	Two Loop MCPR limit
Distracter 3:	Homogeneous.
K/A System:	Generic
K/A Number:	2.2.22 Knowledge of limiting conditions for operations and safety limits.
K/A Value:	3.4/4.1
DAEC Objective Number:	1.03.03.03
	1.03.03.04
DAEC Objective Statement:	Explain Technical Specification safety limits in T.S. and as stated in 10CFR50.36.c.i.(A)
	Evaluate the conditions to determine if Technical Specification safety limits have been violated and identify any required actions,
Cognitive Level:	1I
Source:	New
Operationally Validity:	Reactor/fuel safety limits.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

92. A new A1 control rod sequence is to be loaded into the RWM.

1) From what RWM panel is the new sequence loaded into RWM memory

AND

2) from what panel is the A1 sequence selected for RWM to enforce?

a. 1) RWM-OD (1C05 Operator Display)
   2) RWM-OD (1C05 Operator Display)

b. 1) RWM-OD (1C05 Operator Display)
   2) RWM-CC (1C28 Computer Chassis)

c. 1) RWM-CC (1C28 Computer Chassis)
   2) RWM-OD (1C05 Operator Display)

d. 1) RWM-CC (1C28 Computer Chassis)
   2) RWM-CC (1C28 Computer Chassis)

ANSWER:	d
Answer:	The OI directs both of these actions from the RWM-CC in the back panel area. The system description also describes where the two functions occur.
REFERENCE:	OI 878.8 Rev 15 page 4-5. SD 878.8 Rev 5 pages 22-27
Distracter 1:	These functions are not selectable at the RWM-OD.
Distracter 2:	RWC-CC is correct. However, this function is not selectable at the RWM-OD.
Distracter 3:	RWC-CC is correct. However, this function is not selectable at the RWM-OD.
K/A System:	Generic
K/A Number:	2.2.33 Knowledge of control rod programming.
K/A Value:	2.5/2.9
DAEC Objective Number:	84.00.00.07
DAEC Objective Statement:	Identify the appropriate procedures that govern the Rod Worth Minimizer System operation, include operator responsibilities during all modes of operation, and any action required by personnel outside of the Control Room
Cognitive Level:	1P or S
Source:	New
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

93. A reactor start up is in progress.
The IRMs are being ranged up.
The SRMs have been withdrawn.
The IRMs show Reactor power has peaked and is starting to LOWER.

What is occurring?

a. A Recirc run back has started.

b. Feed flow is increasing for makeup.

c. The Bypass Valves are starting to close.

d. The Reactor has reached the point of adding heat.

ANSWER:	d
Answer:	Normal conditions for startup when reaching the POAH.
REFERENCE:	IPOI 2 Rev 70 page 13. Generic Fundamentals.
Distracter 1:	A Recirc runback will cause power to go down. However, the Recirc pumps are already at minimum speed at this power level.
Distracter 2:	Feed flow maybe increasing for makeup. However, an increase would cause power to go up.
Distracter 3:	The bypass valves will affect reactivity. However, closing would cause power to go up.
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:	2.8/3.2
DAEC Objective Number:	93.00.00.09 93.03.01.11
DAEC Objective Statement:	Explain the techniques used to heatup/pressurize the reactor during startup including a prediction of the response to a change in any controlling factor Evaluate plant conditions and control room indications to determine if the plant is exhibiting proper response during the startup, and identify any necessary actions if the response is not proper
Cognitive Level:	2DR
Source:	New
Operationally Validity:	Power response during reactor startup to the point of adding heat.
OE:	Operators have misdiagnosed 1C05 indications during low power operations.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

94. **RO ONLY**
An individual radiation worker has exposure history as follows:

Date of Birth:	8/29/63
Lifetime Exposure:	23 R
Exposure this year:	0.8 R
Exposure this quarter:	0.2 R

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

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

a. 6 hours

b. 9 hours

c. 10 hours

d. 18.5 hours

ANSWER:	a
Answer:	DAEC Annual administrative limit is 2 REM without permission to exceed the limit however, with permission the limit is 4.5 REM.
REFERENCE:	ACP 1411.17, Rev 14.
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
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
DAEC Objective Number:	GAT Objective
DAEC Objective Statement:	
Cognitive Level:	3SPK
Source:	Bank – 2001 NRC Exam
Operationally Validity:	ALARA
OE:	Excessive exposure.

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

95. 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
Answer:	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.
REFERENCE:	P&ID M-141and M-176
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.
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
DAEC Objective Number:	85.00.00.03 87.00.00.05
DAEC Objective Statement:	Describe in detail the subsystem of the PRM system, including methods State the effluent types monitored by the KAMAN system.
Cognitive Level:	1S
Source:	Bank – 2001 NRC
Operationally Validity:	Rad release to atmosphere.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

96. The plant is being started up following a refueling outage.
Inspectors are in the Drywell performing the 400-psig inspection.
Plant conditions are as follows:

- RPV pressure is 350 psig
- Reactor Power is 6%

Which of the following evolutions would **NOT** be allowed while the inspectors are still in the Drywell?

a. Perform a heavy lift with the Reactor Building Crane.

b. Close the inboard Drywell Personnel Hatch.

c. Movement of fuel within the Fuel Pool.

d. Raise Pressure set to 390 psig.

ANSWER:	d
Answer:	IPOI 7 requires the operator verify RPV pressure to be <400 psig and to allow no significant increases in RPV Pressure.
REFERENCE:	IPOI 7 Rev 67 page 33
Distracter 1:	There are no restrictions on the RB crane with personnel in the Drywell.
Distracter 2:	The inboard hatch could be left open with an operator watching it. However, there is no requirement for this.
Distracter 3:	There are requirements during outages with respect to fuel movement and personnel in the Drywell. However, this would have no effect on the inspectors in the Drywell under these conditions.
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:	2.9/3.3
DAEC Objective Number:	93.25.01.01 93.25.01.02
DAEC Objective Statement:	Explain the bases for each Precaution and Limitation and each Caution in IPOI 7 Explain the restrictions on performing a Primary Containment entry
Cognitive Level:	1P
Source:	New
Operationally Validity:	Radiation exposure and personnel safety. Also IPOI 7 caution.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

97. Which of the procedures listed below would require a DCF to change if you determine that performing one of the steps would lead to serious personnel injury?

a. ODI 19 "Tagging Practices".

b. AOP 301 "Loss of Essential Electrical Power".

c. EOP 2 "Primary Containment Control" Flow Chart.

d. SAG 1 "Primary Containment Flooding" Flow Chart.

ANSWER:	b
Answer:	AOPs are covered in ACP 106.1 and required a DCF for the indicated problem.
REFERENCE:	ACP 106.1 Rev 22 pages 4, 5, and 10.
Distracter 1:	Department instructions do not fall under the DCF requirements and can be changed at a lower level of review. These instructions are not covered by ACP106.1.
Distracter 2:	EOP flow charts that require changed have to undergo a different process for changing and a DFC is not authorized for the change. These instructions are not covered by ACP106.1.
Distracter 3:	SAG flow charts that require changed have to undergo a different process for changing and a DFC is not authorized for the change. These instructions are not covered by ACP106.1.
K/A System:	Generic
K/A Number:	2.4.5 Knowledge of the organization of the operating procedures network for normal / abnormal / and emergency evolutions.
K/A Value:	2.9/3.6
DAEC Objective Number:	96.05.01.11 96.05.01.12
DAEC Objective Statement:	Differentiate between when a Document Change Form (DCF) would be used and when a Procedure Work Request (PWR) would be used, Describe the temporary revision process in accordance with ACP 106.1, including actions required if the computer system is unavailable,
Cognitive Level:	1P
Source:	New
Operationally Validity:	
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

98. **RO ONLY**

A Continuous Recheck Statement exists at the entry into Emergency Depressurization that states:

IF it is anticipated that primary containment water level will rise above 39 feet **THEN** open MSL Inboard Drain Valve MO-4423. If necessary, bypass Group 1 Isolations, Defeat 5.

What is the purpose of this continuous recheck statement?

a. drain the steam lines.

b. establish a coolant flowpath for RPV Flooding.

c. ensure that main steam line drains remain available as an alternate depressurization path.

d. keep the RPV depressurized so low pressure systems can inject for Alternate Level Control.

ANSWER:	c
Answer:	ED flowchart is NOT provided. MO-4423 is in the Drywell and may not open when needed if DW water level is >39 ft.
REFERENCE:	EOP Bases, ED Rev 7 page 5
Distracter 1:	Obvious choice, but there is no reason to drain MSLs.
Distracter 2:	RPV Flood flowpath goes through the SRVs to the Torus, not down the MSLs.
Distracter 3:	RPV has a big leak, the SRVs opened, the RPV will remain depressurized for injection.
K/A System:	Generic
K/A Number:	2.4.6 Knowledge symptom based EOP mitigation strategies.
K/A Value:	3.1/4.0
DAEC Objective Number:	95.80.03.01
DAEC Objective Statement:	Explain the bases for any step, caution, or Continuous Recheck Statement in ED
Cognitive Level:	1B
Source:	Bank – 2001 ILC RO Audit Exam, 1999 RO NRC Exam
Operationally Validity:	EOP bases
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

99. The EOPs have been entered and plant conditions have degraded such that SAG entry is required.
The TSC is **NOT** ready to assume control.

Which of the following is correct?

The operating crew should ...

a. continue implementing the current EOP actions until the TSC is ready to transition to the SAGs.

b. exit the EOP which directs the entry into the SAGs and continue to implement all other EOPs which are entered.

c. exit the EOP leg that is directing the SAG entry and continue to implement all other EOPs legs in effect.

d. enter the SAG that is directed and when the TSC is ready, turnover all actions which were directed from the SAGs entered.

ANSWER:	a
Answer:	Until the TSC is ready the operating crew is directed to continue to use the EOP strategies to combat the event.
REFERENCE:	EOP Bases Document – EOP Flow chart use and logic Rev 4 page 43
Distracter 1:	Exiting the EOPs is correct. However, the TSC must be ready to take control and ALL EOPs are exited at that time.
Distracter 2:	Exiting the EOPs is correct. However, the TSC must be ready to take control and ALL EOPs are exited at that time.
Distracter 3:	Entering the SAGs would be correct if the TSC is ready. The crews do not enter the SAGs without the TSC being ready.
K/A System:	Generic
K/A Number:	2.4.14 Knowledge of general guidelines for EOP flowchart use.
K/A Value:	3.0/3.9
DAEC Objective Number:	95.74.16.01 95.74.16.02
DAEC Objective Statement:	Explain the transition process from EOPs to SAGs Explain the concept of default actions as it pertains to the actions to take while still in EOPs and waiting to make the transition to SAGs
Cognitive Level:	1B
Source:	New
Operationally Validity:	EOP Bases.
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager

Trng Supervisor-Ops

TMARs:

Question Usage (exams): 57_2002 ILC-RO-W_xm.doc

1 Point

100. To place the Reactor Core in a low energy state, reduce RPV temperature, and maintain RPV water level above the top of active fuel to prevent Fuel Cladding temperature from exceeding 1500°F, is the bases for which EOP?

a. EOP 1

b. EOP 2

c. EOP 3

d. EOP 4

ANSWER:	a
Answer:	EOP 1 is utilized to shutdown, cooldown, and maintain ACC.
REFERENCE:	EOP Bases Document – EOP 1 RPV Control Rev 7 Page 1
Distracter 1:	EOP 2 does have the reactor shutdown if conditions warrant. However, this is accomplished by entry into EOP 1 from EOP 2 at entry point 1.
Distracter 2:	EOP 3 does have the reactor shutdown if conditions warrant. However, this is accomplished by entry into EOP 1 from EOP 2 at entry point 1.
Distracter 3:	EOP 4 does have the reactor shutdown if conditions warrant. However, this is accomplished by entry into EOP 1 from EOP 2 at entry point 1.
K/A System:	Generic
K/A Number:	2.4.18 Knowledge of the specific bases for EOPs.
K/A Value:	2.7/3.6
DAEC Objective Number:	95.00.00.03
DAEC Objective Statement:	Explain the overall mitigation strategy of the EOPs
Cognitive Level:	1B
Source:	New
Operationally Validity:	EOP Bases
OE:	

Estimated Completion Time: EB#_____

Time Validation: N/A ☐ (time) Incorrect Ratio Data: (ratio) %

Question Developed By: _____ Peer Checked By: _____

Operator Validated By: _____ _____ _____ _____

Approved By: _____ Date: _____ _____ Date: _____

Operations Manager Trng Supervisor-Ops

TMARs:

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